W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

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Belle Fourche

Under date of January 5, Mr. Beyer Aune reported as follows:

"During the last days of December we had some 8 inches of snow, which amounted to .45 inch of precipitation. The minimum temperature for November and December was zero, and the minimum for the year 1931 was -9, recorded on January 12. The total precipitation for the year was 8.8 inches, which is the lowest on record with the exception of 1911 when the total precipitation was 6.64 inches.

"At this time about 22,000 acre-feet of water is stored in the dam. Water is coming in at the rate of about 350 acre-feet a day from the Redwater River. There has been no water in the Belle Fourche River above the forks of the Redwater since the early spring of 1931. So far the snowfall in the Hills has been very light. On the Owl Creek divide northwest of the Orman Dam there seems to be a good supply of snow. This together with what we may expect from the Hills should insure a fair supply of water for 1932.

"The rather uncertain outlook for irrigation water in 1932 has delayed, to some extent, the actual signing up of contracts for the renting of farms. Most of the renters are expecting to stay and have made tentative agreements for 1932; and as the water supply for 1932 is improving, contracts are now being signed.

"The Sugar Company has not issued any statement as to the 1932 beet contracts. Now that the water supply is fairly well assured, it will undoubtedly make its contract known. Farmers seem anxious to sign up for beets this year, as this is the only crop whose returns in the fall they can foretell with any degree of certainty."

Newlands

The average maximum temperature for the 30-day period ending January 9 was 38, with a maximum of 47 on January 9; the average minimum temperature was 16.3, with a minimum of -7 on December 15 and 16. The mean temperature was 27.1. The average hourly wind movement was 2.2 miles. There were 2.01 inches of precipitation during this period.

Severe storms occurred over the entire Pacific Coast during December. All December records for snowfall in the Sierras during the past 40 or 50 years were broken. On the Summit crossing of the Lincoln Highway the snow is about 16 feet deep. This exceeds the entire snowfall of any winter since 1924, and the storms of January and February are still to come. The record snowfall measured is 26 feet, and this may be equalled or exceeded this year.

As a result of the heavy snowfall, the prospects for ample irrigation water next season are bright. There are heavy coverings of well-packed snow on the watersheds of both the Carson and Truckee Rivers.

Newlands (cont'd)

The Lahontan Reservoir has already shown an increase in water supply and contains at present about 12,000 acre-feet. Its total capacity is 272,000 acre-feet. It is expected that the dam will overflow its spillways for the second time in history.

The prices of farm products on the project still continue low. The price of butterfat has dropped to 23 cents a pound and eggs to 24 cents a dozen. This further decline in the prices of these two products works a greater hardship on the local farmers. Very few dairy herds can pay for their keep at 23 cents a pound for butterfat.

A summary of the recent yearly agricultural census, which was taken by the district officials in cooperation with Mr. Headley's office of the State Experiment Station, throws some interesting light on the agricultural conditions of this project. A comparison of the total value of the farm crops and farm livestock of the project during the years 1929 and 1931 is rather striking. During 1929 this total value amounted to $3,119,700. This has decreased to $1,643,632 in 1931, or almost 50 per cent. Some of this decreased value is due to the short crop of alfalfa harvested this past season of drought. However, much of it is due to the low selling price of farm crops and livestock.

This decrease in the value of farm products was accompanied by a decrease of some 4,000 acres in the irrigated area. Most of this decrease in the area irrigated was because of a shortage of water. During years when irrigation water is ample some unproductive areas are irrigated to promote the growth of native grasses for pasture.

The work at the station is being continued along the lines previously reported. Fertilizer has been applied as usual to the experimental plots and the pastures have been manured. The changes in the fields as outlined in previous reports are still underway. A little delay has been caused by a broken gear in the tractor, but work will soon be resumed. At present the weather is ideal for tractor operation, as the ground has thawed and remains damp and in workable condition.

In the office data is being assembled and material arranged for the usual detailed report of the work of the station during the past year. It usually takes seven or eight weeks to complete this report.

E. W. Knight.

Prosser

The snowfall for the week ending January 2 amounted to 3.8 inches, most of which fell on December 30. The minimum temperature was 16.5° and the maximum 45°. The total precipitation for the month of December was 3.02 inches and the total snowfall was 8.8 inches. The mean maximum temperature for December was 32.9° and the mean minimum 19.6°, giving a mean of 26.2°. During the past month 19 days were cloudy, 5 were partly cloudy, and 7 were clear.

At the present time there are 72 inches of snow in Snoqualmie Pass of the Cascade Mountains. The reservoirs of the Bureau of Reclamation are not filling up very rapidly, which will probably be conducive to more rapid run-off and loss of water in case of an early thaw.

The lambs being fed on contract at the station will be shipped during the following week. The lambs on experimental rations will be

Prosser (cont'd)

held for two or three weeks to complete the feeding work.

The price of butterfat has declined to 22 cents a pound, which is almost as low as the price last spring. Hay trading has been very slow with the quotations remaining at $8.50 to $10 per ton. Some potatoes have been sold for $7.00 a ton for No. 1's and No. 2's, the buyers doing the sorting and furnishing the sacks. This is equivalent to $11 a ton in sacks; but if the potatoes run 50 per cent to each grade, this price would be equivalent to $14 a ton for No. 1's and $8.00 for No. 2's. The number of cars of potatoes shipped from the valley during December was the lowest since 1925.

Snow covered the ground during most of the week ending January 9 and did not show signs of melting until the latter part of the week. The weather conditions for the past year are shown in the following table:

Months	Temperatures			Precip-itation	Monthly evaporation	Hourly wind velocity
	Maximum	Minimum	Mean			
				Inches	Inches	Miles
January	41.9	29.1	35.5	0.095	---	0.92
February	48.4	27.7	38.0	.02	---	1.14
March	57.7	32.2	44.9	.765	3.632	2.74
April	67.7	38.7	53.2	.44	4.54	4.23
May	80.4	46.1	63.2	.01	8.164	3.48
June	80.2	50.3	65.2	.80	5.308	2.10
July	91.1	54.4	72.7	.0	8.17	1.38
August	87.5	52.3	69.9	.0	6.606	1.20
September	77.5	47.7	62.6	.17	4.18	1.67
October	65.3	38.5	51.9	.51	2.816	2.22
November	46.2	28.2	37.2	1.51	---	2.27
December	32.9	19.6	26.2	3.02	---	1.46

The annual precipitation was 7.34 inches, which is a little above the average. The total evaporation amounted to 43.42 inches for eight months; however, records were taken only five days the latter part of March.

The maximum temperature for the week was 53°, occurring on January 9, and the minimum was 17° on January 4. The greatest daily range was 23.5°. Rain in the Cascades has decreased the amount of snow on the ground.

On January 5 1250 sheep, which were being fed on contract at the station, were shipped. The remainder of the flock will be shipped in two weeks.

The price of butterfat is now 20 cents a pound, and eggs are 21 cents a dozen for standard whites, cases included.

Poultrymen have been using in feed mashes ground alfalfa consisting of leaves and blossoms. Not enough alfalfa meal suitable for poultry mashes is manufactured in the Yakima Valley to meet the demand of the poultrymen in western Washington, so additional supplies are sent from California. The alfalfa, cut young before it blooms, is most desirable for ground mashes because the stems can also be used.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending January 2 was 35°, with a maximum of 56; the average minimum was 16, with a minimum of 5°. The average hourly wind movement was 7 miles. The precipitation was .82 inch, making a total of 7.32 inches for the year.

The last week of the year ended with a rather severe storm. The snowfall, commencing on the 29th and continuing through the day and into the night, varied from 7 to 10 inches. It was followed by two days of heavy winds. The storm was general all over the mountain States, but there was no loss of life as the temperatures were not low enough to be dangerous. However, roads were blocked and traffic was entirely suspended for several days. At the end of the period only the main highways were opened. The county will start graders on the secondary roads the first of next week in order that school buses may operate.

The precipitation during the year was the smallest since records have been kept at the station, it being just one-half the average for the last 22 years. The average precipitation for this period has been 14.62 for the year and 11.89 inches for the growing season, April 1 to September 30. For 1931 the rainfall was 7.32 and 3.97, respectively. A wide variation from the average marked the distribution of the rainfall the past year. According to the averages, 19 per cent of the total rainfall or moisture has come in the non-growing season and 81 per cent during the growing season. In 1931 46 per cent of the moisture came in the non-growing and only 54 per cent in the growing season. The distribution during the growing season checks fairly close to the averages.

The following table gives the recorded moisture during the growing season for the last ten years:

Year	April	May	June	July	August	Sept	Total	Total for year
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
1922	3.49	3.72	1.16	3.12	0.27	0.36	12.12	14.81
1923	.30	2.85	5.40	3.37	3.40	.95	16.27	19.87
1924	.64	1.64	1.01	1.05	.40	2.98	7.72	9.95
1925	.74	3.40	4.05	1.27	.33	.76	10 55	13.57
1926	.61	2.13	4.93	1.71	1.24	1.20	12.72	15.19
1927	2.92	2.66	3.93	1.83	4.82	1.92	18.08	21.48
1928	.03	2.41	3.72	2.53	.33	.24	9.26	12.04
1929	2.44	1.64	3.04	.72	.54	3.08	11.48	13.91
1930	2.78	4.87	1.53	.26	5.70	3.39	17.53	20.82
1931	.33	1.89	.45	.39	.36	.55	3.97	7.32
Average	1.43	2.72	2.92	1.62	1.74	1.54	11.97	14.90

Notwithstanding the scant rainfall and the serious shortage of irrigation water, crops did not suffer serious losses in yield. The average yield of sugar beets in the valley was practically the same as last year when the rainfall was more than four times as great and there was no shortage of irrigation water. This indicates a very efficient use of water the past season.

For several years this county has been under quarantine from some of the Southern States on account of a reported infestation of

Scotts Bluff (cont'd)

alfalfa weevil. No weevils ever were found in this county, but they were erroneously reported to be in this county. Through the efforts of this station the matter has been corrected and the quarantine lifted.

The average maximum temperature for the week ending January 9 was 35°, with a maximum of 45; the average minimum was 11, with a minimum of zero. The week was one of high winds, the average hourly wind movement being 9.3 miles. The precipitation amounted to .07 inch and came in a light rain that turned to snow, which lasted only long enough to cover the ground.

The routine of caring for the stock has been the only work possible at the station during this period.

The National Beet Growers' Association held its annual meeting at Greeley, Colorado, during the week. Officials of the United States Beet Sugar Association were present and addressed the meeting, urging cooperation along all lines between producers and refiners. Fred Cummings, of Fort Collins, was elected president and Charles M. Kearney, from Morrill (North Platte Valley), vice-president.

A new potato growers organization, known as the Nebraska-Wyoming Potato Growers and Shippers Association, was perfected at a meeting held in Scottsbluff this week. Its purpose is to represent potato men in all matters pertaining to the marketing and growing of potatoes. George M. Jenkins, of Hemingford, was elected president and E. E. West, of Mitchell, vice-president.

The price of potatoes has advanced to 55 cents per hundred and shipments are being made.

The movement of lambs to market has commenced, and the shippers struck a favorable market last week. Several loads from the valley sold at the top price of $6.25. This price did not hold and lambs are back again to the old price of $5.00 to $5.50.

Butterfat and eggs are still declining in price, butterfat selling for 20 cents a pound and eggs for 22 cents a dozen.

James A. Holden.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

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Prosser

A rather sudden increase in temperature the first part of the week ending January 16 caused the snow to disappear very rapidly. The large amount of run-off water caused by the thaw greatly increased the volume of water in the Yakima River. The maximum temperature recorded was 54° on January 11. The temperature declined the latter part of the week to a minimum of 10°. In Snoqualmie Pass of the Cascade Mountains the snow is 60 inches deep.

Construction work has been commenced on the auxiliary power unit at the Prosser dam under the direction of the Yakima Valley Reclamation Service. The present dam in the Yakima River at Prosser is to be built higher, and a canal will be constructed to conduct the water down the river some distance before it is run through a power plant. The primary purpose of the new construction is to supply electrical power for pumping water to the Highland district at Kennewick.

Farm work during the week consisted of hauling manure and feeding sheep. A Feeders' Day will be held at the station so that the farmers may obtain first-hand information about the lamb-feeding experiments.

During the week eggs declined 3 cents a dozen and are now quoted at 18 cents, cases included. Producers who stored onions are receiving $70 a ton, but the major portion of that crop is in the hands of the dealers.

Carl A. Larson

San Antonio

Report for four weeks ending January 2
(Note: This report was not received in time to include it in the previous issue.)

The showery weather which began the latter part of November continued well into December, a measurable amount of precipitation for 13 of the first 21 days being recorded. Field work was not possible during this time. Although the soil was still too wet for the best results, some disking in preparation for small grains planting was started on December 23. Oats plots in the rotations were planted on December 24 and 28. The small grain variety test, flax variety test, flax time-of-planting test, and flax increase plantings were completed December 28 to 30. Another rain of .47 inch occurred on January 2.

The mean temperature for the second week of the period was somewhat below normal, although the weather was not seriously cold. During the remainder of the month temperatures were mostly above normal with the result that the mean December temperature shows an excess of 2.4°.

Dr. J. J. Skinner and Mr. Paul R. Dawson, of the Bureau of Chemistry and Soils, were station visitors December 15.

San Antonio (cont'd)

Summary of Climatological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							In.	Days	Days	Days
Dec. 12	78	64.0	37	49.7	56.9	26	2.41	1	3	3
" 19	66	54.6	29	35.4	45.0	28	.96	1	3	3
" 26	77	71.4	36	46.3	58.9	30	.01	3	3	1
Jan. 2	77	68.9	30	45.7	57.3	33	.47	3	2	2
Month of December	78	63.7	29	43.6	53.7	33	3.43	7	13	11

Climatological Review of 1931

The first seven months and the last month of 1931 were characterized by an excess of rainfall. During the last third of July and all of the four succeeding months there was a decided deficiency of precipitation.

No extremely low minimums occurred during the winter of 1930-31, the absolute minimum for the winter being 23° F. on December 16, 1930. The January minimum was 28, while during February the temperature never went below 36°. Freezing weather occurred the three nights of March 6, 7, and 8, but the temperature only dropped to a minimum of 28 during that period. Notwithstanding these relatively high minimum temperatures, the mean monthly temperatures were subnormal for January, March, April, and May. The February mean was slightly above normal. The maximum temperature for the summer months was only 99°, and the mean temperatures for those months were well below normal. Dry, warm weather continued throughout the fall months, with unusually warm weather during December. The mean temperatures for the last four months of the year were all well above normal. No severe storms of any kind occurred throughout the year.

The combination of abundant soil moisture and subnormal mean temperatures with relatively high minimum temperatures during the winter and spring months was exceptionally favorable to flax and small grains. These crops produced record yields of high quality. Corn required longer than usual to emerge after planting. A period of 23 days without effective rainfall during June caused the plants slight distress for a short time, but a series of soaking rains from June 26 to 29 occurred before the crop had suffered much and assured ample moisture to mature the grain. The yields were above average.

Grain sorghums, like corn, were slow to emerge because of a cold, damp seed-bed. All seed had been dusted with copper carbonate and little, if any, rotted. Good stands were finally obtained in all plantings, and seasonal conditions were favorable to the crop throughout its growth except for the semidrought of mid-June. Midge damage was negligible except in the later flowering strains in the variety test. Birds, principally sparrows, were unusually numerous and caused severe loss of grain. Harvesting and threshing were accomplished under ideal weather conditions. The grain was of excellent quality and the yields were above average.

San Antonio (cont'd)

Climatic conditions were ideal for the preparation of cotton seed-beds, and cotton made a very good start. Rainy weather through the latter part of April and all of May was favorable to the multiplication of boll weevils, and dusting was started on June 23. The heavy rains which followed interfered, and it was necessary to start a new schedule of dustings on July 2. Good control was obtained. A heavy plant growth had been made by this time and cotton boll worms became seriously numerous. An abundance of rain during the middle of July resulted in the humidity remaining high under the rank growth of cotton. Black arm disease (Phytomonas malvacearum) became very active and by the first of August had caused an estimated loss of about 20 per cent of the bolls. This disease practically disappeared by the third week of August. It is worthy of note that in 1928 when black arm was a serious factor at this station practically all plants were defoliated, but very little leaf infection of black arm occurred in 1931.

Cotton boll weevils multiplied rapidly after the July rains and were a serious pest during the remainder of the season. No effective rainfall occurred after July 18 until early in December. Late-season crops and non-irrigated trees suffered severely for moisture. Fall plowing was greatly interfered with, and the planting of winter crops was delayed until the close of the year.

The last frost of the spring occurred the night of March 8 with a minimum temperature of 28°. The first frost of the fall occurred the night of December 3 with a minimum of 32°, giving a frost-free period for the year of 270 days—10 days longer than the average of the preceding 24 years.

Report for the two-week period ending January 16

Temperatures during the first week of January were near normal, but the second week was unseasonably warm. Good rains occurred on the 3d and 4th of the month, while almost continuously showery weather persisted from the 10th to the 16th, inclusive, with very little precipitation.

The following climatological data were recorded:

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum			G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean	Mean					
							In.	Days	Days	Days
Jan. 9	77	64.0	32	38.6	51.3	29	2.57	4	1	2
" 16	79	73.6	41	50.3	61.9	28	.26	1	1	5

Small grains and flax planted the latter part of December emerged during the period. In most cases the stands were excellent. The heavy rains of the first of the month washed the drill furrows full and buried the seed so deeply in some places that emergence was very slow and spotted. In a few places the plants could not emerge and the stand is very thin for this reason.

Plantings for feed were made of oats in fields B-3 C-3, D-4 (including the pistache orchard), and D-5, and of wheat in field E-3.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending January 16 was 31°, with a maximum of 45; the average minimum was 10, with a minimum of 2 below zero. No precipitation was recorded. The average hourly wind movement was 9.4 miles.

Only the routine work of the station has been carried on during the week. The office force has been engaged in the preparation of reports and working up field data.

The Beet Growers' Association held its annual meeting during the week and reelected Frank Thomas president. Practically all of the old board were reelected. No announcement of plans for the coming season has been made.

About 60 cars of lambs were shipped from the valley at the end of the week when the tops on fat lambs at Omaha was $6.00 per hundred. Hogs are still below $4.00, but the price for fat steers has made a slight advance. The steers on test at the station are about ready for market. The last shipment of turkeys from the valley will be made the latter part of the month.

Butterfat has declined to 18 cents a pound and eggs are back to 15 cents a dozen.

The average maximum temperature for the week ending January 23 was 39°, with a maximum of 55; the average minimum was 12, with a minimum of 6. The average hourly wind movement was 8.9 miles. No precipitation was recorded.

Weather conditions have been very favorable during the week. About all the snow has disappeared except that in the heaviest drifts.

The lambs on feed are doing well; so far there has been no loss. The low price of fat lambs has a tendency to slow up the shipments just now. In addition to the regular Saturday stock trains over the Burlington and Union Pacific, each railroad is putting on special trains--the Burlington on Monday and the Union Pacific on Tuesday of each week. This will spread the receipts over the week and avoid such a big run on Monday's market.

The Pathfinder Irrigation District has just completed its annual crop report. It shows that the cropped area for 1931 was 90,427 acres, just 91 acres less than 1930 when the acreage was the largest in the history of the project. The population of the district shows an increase of 10 per cent, indicating a movement back to the farm. Owing to the extremely low prices of all farm products, the total crop value was the lowest since 1915 when only 70,000 acres were in crop. The report reveals a shifting in acreage of the grain crops, as follows:

Crops	1912	1931
	Acres	Acres
Corn	6,260	18,781
Barley	1,156	11,901
Oats	10,093	2,752
Wheat	4,390	727

Notwithstanding the shortage of water and unfavorable conditions of the past season, yields were but little below 1930 when there was four times the rainfall and no water shortage. In the two principal cash crops--beets and potatoes--beets yielded .6 ton above the 10-year average and only 1 ton per acre less than in 1930. Potatoes yielded only 3 bushels per acre less than in 1930 and 14 bushels more than the

Scotts Bluff (cont'd)

10-year average.

The price of butterfat at the local markets is down to 18 cents, which is about 3 cents below the price a year ago. The price of butter is down in proportion, and one of the ice-cream factories has reduced its price to 75 cents a gallon. Eggs are selling at 15 cents a dozen, which is 3 cents above the price a year ago. Livestock markets at Omaha: Tops--cattle, $10.75; hogs, $3.85; fat lambs, $5.65.

James A. Holden.

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M I S C E L L A N E O U S

THIRD YEAR RESULTS OF EXPERIMENTS IN FATTENING LAMBS AT THE HUNTLEY FIELD STATION

Fattening lambs for market is a ranch enterprise particularly adapted to the sugar beets districts of Montana. The results presented in this report represent experimental work of the winter of 1931-32 in efforts to determine the best combinations of feeds for fattening lambs.

Lambs used.- Range wether lambs, with a predominance of Rambouillet breeding, were used in these trials. The lambs were fairly smooth, of good type and quality, and were of light weight. With the exception of 60 that were purchased near Columbus, these lambs were from the Montana Experiment Station band at Bozeman, and were just off the forest, where they had been all summer. All lambs weighing in excess of 80 pounds had been taken out of the station flock and sent to market. A number of the late lambs were of light weight, and they were put into two separate lots.

Description of Feeds

Barley: Trebi.
Hard wheat: No. 2 Dark Hard Winter.
Soft wheat: No. 1 Federation.
Corn: No. 2 yellow, of good quality.
Cottonseed cake:- Prime quality, sheep size, 43 per cent protein.
Molasses: Beet molasses from the Great Western Sugar Company.
Beet tops: Exceptionally good and dry.
Beet pulp: Ensiled pulp from pulp silo at station. Secured from the Great Western Sugar Company. Two cars shipped October 16 and 1 car November 9.
Bean straw: Good quality.
Alfalfa: Exceptionally good quality first cutting hay.

Losses.- Seven lambs out of the 360 died during the 86 days of the experiment, a death loss of less than 2 per cent. Two sheep, in addition to the 7 lambs, died as a result of injuries received when dogs raided the pens the night of December 30. The exact effect of this disturbance upon the experiment is difficult to estimate.

Results of Experiments in Feeding Lambs on Various Rations
Oct. 9, 1931 to Jan. 3, 1932 - 86 days

Lot No.	I	II	III	IV	V	VI	VII	VIII	IX	X
Ration	Barley, alfalfa	Barley, tops, alfalfa	Barley, pulp, alfalfa	Barley, pulp, c.s. cake, alfalfa	Barley, pulp, c.s. cake, molasses, alfalfa	Hard wheat, pulp, alfalfa	Soft wheat, pulp, alfalfa	Corn, pulp, alfalfa	Oats, pulp, alfalfa	Barley, pulp, bean straw, tops,
Number of lambs	30	30	30	30	30	30	30	30	30	30
Av. initial weight lbs.	71.4	71.1	70.1	69.6	70.9	71.4	70.8	70.9	70.9	71.1
Av. final weight "	93.6	94.9	99.1	104.2	102.0	101.8	101.0	104.0	103.6	100.2
Av. daily gain "	.26	.28	.33	.40	.36	.35	.35	.38	.38	.34
Av. daily feed: lbs.										
Barley	1.13	1.10	1.05	1.13	1.05	---	---	---	---	1.08
Wheat, hard	--	--	--	--	--	1.11	---	---	---	--
Wheat, soft	--	--	--	--	--	--	1.07	---	---	--
Corn	--	--	--	--	--	--	--	1.02	---	--
Oats	--	--	--	--	--	--	--	--	1.16	--
Cottonseed cake	--	--	--	.19	.18	--	--	--	--	--
Molasses	--	--	--	--	.27	--	--	--	--	--
Bean straw	--	--	--	--	--	--	--	--	--	.87
Beet tops	--	1.93	--	--	--	--	--	--	--	1.88
Beet pulp	--	--	6.10	6.23	5.95	6.22	5.95	5.95	6.61	5.40
Alfalfa	2.56	1.70	1.69	1.61	1.57	1.72	1.66	1.79	1.73	.07 1/
Cost per cwt. gain 2/	$8.87	$7.62	$6.76	$6.28	$7.08	$6.54	$6.32	$6.51	$6.31	$6.38
Initial cost per head (@$4.00 cwt.)	$2.86	$2.84	$2.80	$2.78	$2.84	$2.86	$2.83	$2.84	$2.84	$2.84
Feed cost per lamb	1.97	1.82	1.92	2.18	2.20	1.99	1.91	2.15	2.06	1.85
Est. value per cwt., So.St.Paul 3/	5.20	5.50	5.50	5.65	5.65	5.65	5.65	5.65	5.65	5.35
Est. value per cwt., Huntley (So.St.Paul less $1.20)	4.00	4.30	4.30	4.45	4.45	4.45	4.45	4.45	4.45	4.15
Est. value per lamb, Huntley	3.74	4.08	4.26	4.64	4.54	4.53	4.49	4.63	4.61	4.46
Cost per lamb, Huntley	4.83	4.66	4.72	4.96	5.04	4.85	4.74	4.99	4.90	4.69
Margin over lamb and feed cost	-1.09	-.58	-.46	-.32	-.50	-.32	-.25	-.36	-.29	-.23

1/ Fed alfalfa first ten days only.

2/ Feed prices per ton: Grain $20, except corn $25; alfalfa $9, beet tops $2.50, cottonseed cake $25, bean straw $3.50, molasses $12, wet beet pulp $1.40.

3/ Prices based on top price of $5.75 per cwt. at So.St.Paul. Overweight lambs not taken into consideration in determination of price per cwt.

Results of Experiments in Fattening Lambs (cont'd)

Method of Feeding

Time of feeding.- A feed of hay was given the first thing in the morning. This hay was stirred up at noon and a heavy feed was given at dusk. All feeds were fed twice daily, morning and evening.

Place of feeding.- Molasses was fed on the pulp along the panels. All roughages were fed along the feeding panels. Grain and cake were fed in the grain feeding pens, and 30 minutes was allowed at each feed.

Feed allowance.- The cottonseed cake was limited to one-fourth pound per head daily except in Lot XII. The molasses was limited to one-third pound per head daily. All grain rations and roughages were full-fed.

Comparison of Results - Table on page 11

Lots I, II, and III.- The addition of beet tops to a barley and alfalfa ration in Lot II resulted in slightly increased gains, less grain consumed, and lower cost of gains over Lot I, fed barley and alfalfa. Lot II produced more finished lambs and were valued higher than Lot I, which made the poorest gains, the most costly gains, and the least finish of any lot in the experiment.

Siloed beet pulp was added to the basic ration of barley and alfalfa in Lot III. The addition of pulp decreased by 28 per cent the grain required to produce 100 pounds gain, the alfalfa by 45 per cent, and resulted in a greater gain, at 24 per cent less cost than Lot I.

The results of this trial confirm the findings of the two previous experiments, using similar rations.

Lots III, IV, and V.- Cottonseed cake added to a ration containing barley, pulp, and alfalfa, increased the rate of gain, decreased by 12 per cent the amount of barley required to produce 100 pounds gain, the alfalfa by 22 per cent, and the pulp by 16 per cent. The cost of gain was less in Lot IV than in Lot III and the lambs were valued higher due to better finish. These results differ from the trials conducted previously, partly because cottonseed cake was much cheaper this year. In comparison with Lot III, if the savings in Lot IV are credited entirely to cottonseed cake, it was worth $45 a ton.

In all three tests cottonseed cake has produced slightly increased gains, but in each of two trials it did not pay because of its higher price. This year with cheaper grains and cake costing only slightly more than grain, and with a little greater advantage in gains, the addition of cottonseed cake reduced the losses.

Lot V received molasses in addition to the same feeds given Lot IV. The addition of molasses seemed to decrease the gains slightly, added to the cost of the gain, and increased the total amount of feeds necessary to produce an equal gain with Lot IV. In this trial the addition of molasses to a ration of barley, pulp, alfalfa, and cottonseed cake failed to be of any advantage.

Lots III, VI, VII, VIII, and IX.- These five lots were all fed alfalfa and pulp, but each lot was given a different grain. Corn, because it is regarded as the standard grain for fattening, was included mainly to give a comparison with wheat, both hard and soft, barley, and oats. Corn and oats proved to be the most efficient grains as far as gains were concerned. The cost of gains ranked as follows: Oats, soft

Results of Experiments in Fattening Lambs (cont'd)

wheat, corn, hard wheat, and barley. There was 45 cents difference in the cost of gains between the highest and the lowest of these lots. In this test it took 266 pounds of corn to produce 100 pounds of gain, 303 pounds of soft wheat, 304 pounds of oats, 313 pounds of hard wheat, and 318 pounds of barley. Barley was the least efficient grain and required more hay and pulp to produce equal gains with the other lots. Corn, soft wheat, and oats were the most efficient grains, while hard wheat and barley were somewhat less efficient. There was not much difference in the rate of gain of the five lots. Each lamb in these lots was valued as to its finish. Practically the same number of fat lambs were found in each of these five lots and the valuation was the same.

This is the second trial in which oats as a grain for fattening lambs has shown up surprisingly well. In a previous trial corn and soft wheat were practically equal.

Lots III and X.- In Lot X bean straw and beet tops were fed with barley and pulp, instead of alfalfa, as fed in Lot III. It was intended to stack bean straw and alternate layers of tops and feed from this stack. The tops were evidently stacked too green as the whole stack spoiled. After that the tops were hauled in from the field as needed. Bean straw and tops produced as much gain when fed with pulp and barley as did alfalfa and at less cost. Exactly the same amount of barley was required in each lot to produce the same amount of gain. The fact that a ton of bean straw and tops together cost only one-third as much as a ton of alfalfa gives Lot X the advantage. Although the gains were the same in each lot, there was a difference in the degree of finish. Lot X was valued at 15 cents less per cwt. than Lot III.

Results of Experiments in Fattening Lambs (cont'd)

Table II.- Light vs. Medium Weight Lambs
Oct. 9, 1931 to Jan. 3, 1932 - 86 Days

	Medium weight lambs	Light lambs	
Lot No.	IV	XI	XII
Ration	Barley, pulp, c.s. cake, alfalfa	Barley, pulp, c.s. cake, alfalfa	Barley, pulp, c.s. cake, alfalfa
Number of lambs	30	32	32
Average initial weight ..... lbs.	69.6	55.1	54.2
Average final weight ..... "	104.2	85.6	86.6
Average daily gain ..... "	.40	.35	.38
Average daily feed: lbs.			
Barley	1.13	1.02	1.02
Cottonseed cake	.19	.16	.32
Beet pulp	6.23	4.70	5.04
Alfalfa	1.61	1.41	1.44
Cost per cwt. gain 1/	$6.28	$6.16	$6.41
Initial cost per head @$4 cwt.	$2.78	$2.20	$2.17
Feed cost per lamb	2.18	1.87	2.08
Est. value cwt. So. St. Paul 2/	5.65	4.90	5.05
Est. value cwt. Huntley (So. St. Paul less $1.20)	4.45	3.70	3.85
Est. value per lamb Huntley	4.64	3.17	3.33
Cost per lamb Huntley	4.96	4.07	4.25
Margin over lamb and feed cost	-.32	-.90	-.92

1/ Feed prices per ton: Grain $20, cottonseed cake $25, alfalfa $9, wet beet pulp $1.40.

2/ Prices based on top price of $5.75 per cwt. at So. St. Paul. Overweight lambs not taken into consideration in determination of price per cwt.

Comparison of Results - Table II

Lots IV, XI, and XII.- A number of light lambs were available and were included in the experiment. These were late lambs, in good thrifty condition. They were divided into two equal lots and fed the same ration given to Lot IV, barley, pulp, cottonseed cake, and alfalfa, except Lot XII, which was fed all the cottonseed cake they would clean up. This was done in order to determine the effect of a large amount of protein on these small lambs. Lot XI was fed about one-sixth pound of cake a day, compared to one-fifth pound given Lot IV, while Lot XII took one-third of a pound. The additional amount of protein given Lot XII made little change in the amount of feed required to produce 100 pounds of gain as compared with Lot XI, but it added 25 cents per cwt. to the cost of the gains and the rate of gain increased slightly. However, the lambs in Lot XII showed a little more finish than did those in Lot XI, and consequently were valued at 15 cents a cwt. higher. At the present price of cottonseed cake its addition to the ration paid for itself; but no conclusions should be drawn from these results, as these lambs were not finished at the close of the trial. This trial indicates that the light lambs make equal gains with larger lambs when fed by themselves. If forced to compete at the feed trough with the larger

Results of Experiments in Fattening Lambs (cont'd)

lambs, under the cafeteria system of feeding, they would not have the chance they had in this case.

Compared to the larger lot (Lot IV) fed the same ration, Lots XI and XII required practically the same amount of feed to produce the same amount of gain. They needed slightly more grain but less pulp. Lot XI made cheaper gains than did Lot IV. Their finish cannot be compared as they require a longer feeding period.

Conclusions

1. A ration of barley and alfalfa seems inadequate for finishing lambs in Montana. In four trials lambs fed a ration of barley and alfalfa showed the least finish of any of the grain-fed lots.
2. In three trials the addition of beet tops to a barley and alfalfa ration during the entire feeding period resulted in greater gains. In two trials the addition of beet tops resulted in less finish and less profits than where barley and alfalfa made up the ration.
3. In three trials the addition of pulp to barley and alfalfa materially improved the ration. If the differences in profit of these trials are credited to pulp, pulp shows a feeding value of $3.99 per ton.
4. According to two trials, soft and hard wheat each proved to be better feeds than barley when fed with pulp and alfalfa. The net returns per lamb were at least ten per cent less when fed barley than when fed wheat.
5. According to two trials there was very little difference in the feeding value between hard and soft wheat when fed with pulp and alfalfa; soft wheat seemed to be slightly more efficient.
6. Before definite conclusions can be drawn as to the relative values of corn and wheat when fed with pulp and alfalfa, further trials must be conducted.
7. The results of three different trials indicated that the addition of cottonseed cake to barley, pulp, and alfalfa increased the gains, the cost of gains, and the selling price, but not the financial returns. In a fourth trial similar results were obtained except that cottonseed cake produced more finish and reduced the losses.
8. According to three trials, the addition of molasses to a ration of barley, cottonseed cake, pulp, and alfalfa, increased the cost of gains and reduced the profits.
9. In two trials oats gave more rapid and economical gains and greater net returns than barley, hard wheat, and soft wheat when fed with pulp and alfalfa.

(These trials must be repeated before final conclusions can be drawn.)

W. F. Dickson
Dan Hansen.

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"Boron in Irrigation Waters," by Carl S. Scofield and L. V. Wilcox, has recently been published as Technical Bulletin No. 264.

Mr. Dan Hansen, Superintendent of the Huntley Field Station, arrived in Washington on January 17.

THE GROWTH OF ROOTS IN SOIL BELOW THE WILTING POINT

All of the work that has been done heretofore upon the water requirement and the wilting coefficient of plants has shown that plant roots can not elongate into a soil which is below the wilting point. Under the conditions of these experiments this is unquestionably true, but in Nature the plant does not always grow under the conditions which are often imposed upon it in pot experiments. Part of the roots of plants in Nature are usually in a subsoil where there is available water, while the surface roots may be in a soil which is drawn down to the wilting point. It is the experience of the writer that under such conditions a root will elongate into a soil at the wilting percentage and even absorb water from such a soil. I have drawn the moisture of a soil from the wilting point of 21 per cent down to 17 per cent by dividing the roots, placing a few of them in water, and the rest of the root system in the soil.

I have often noticed that palo verde or mesquite roots will grow down into our desert soils 50 feet or more. These same soils are never wet to a depth of more than about 2 feet. Evidently the roots are drilling their way slowly through a dry soil toward the water table. The soil immediately in contact with the roots is always moist. The plant is probably taking up moisture from the occasional rains upon the surface, transporting this to the subsoil, and moistening the soil in front of the growing tip. Thus the tip never comes in contact with the dry soil.

The drawing on the following page shows an experiment with several palo verde seedlings. These were germinated by soaking the seeds for four hours in concentrated sulphuric acid, then washing them and placing them between wet towels. After such a treatment they sprout as quickly as mustard. They were planted in tall cylinders in a soil which showed a wilting point of 21.5 per cent. As indicated in the drawing by the figures on the left, the soil was made up in layers, beginning at the bottom with air-dry soil, at 5.2 per cent, then layers of 14 per cent, 19.2 per cent, and 24 per cent. The top layer had some available moisture. The cylinder was sealed over the top with paraffine and beeswax, and no water was added during the experiment. By tilling the culture cylinder, the roots were encouraged to grow downward along the sides of the glass, and their elongation could be observed.

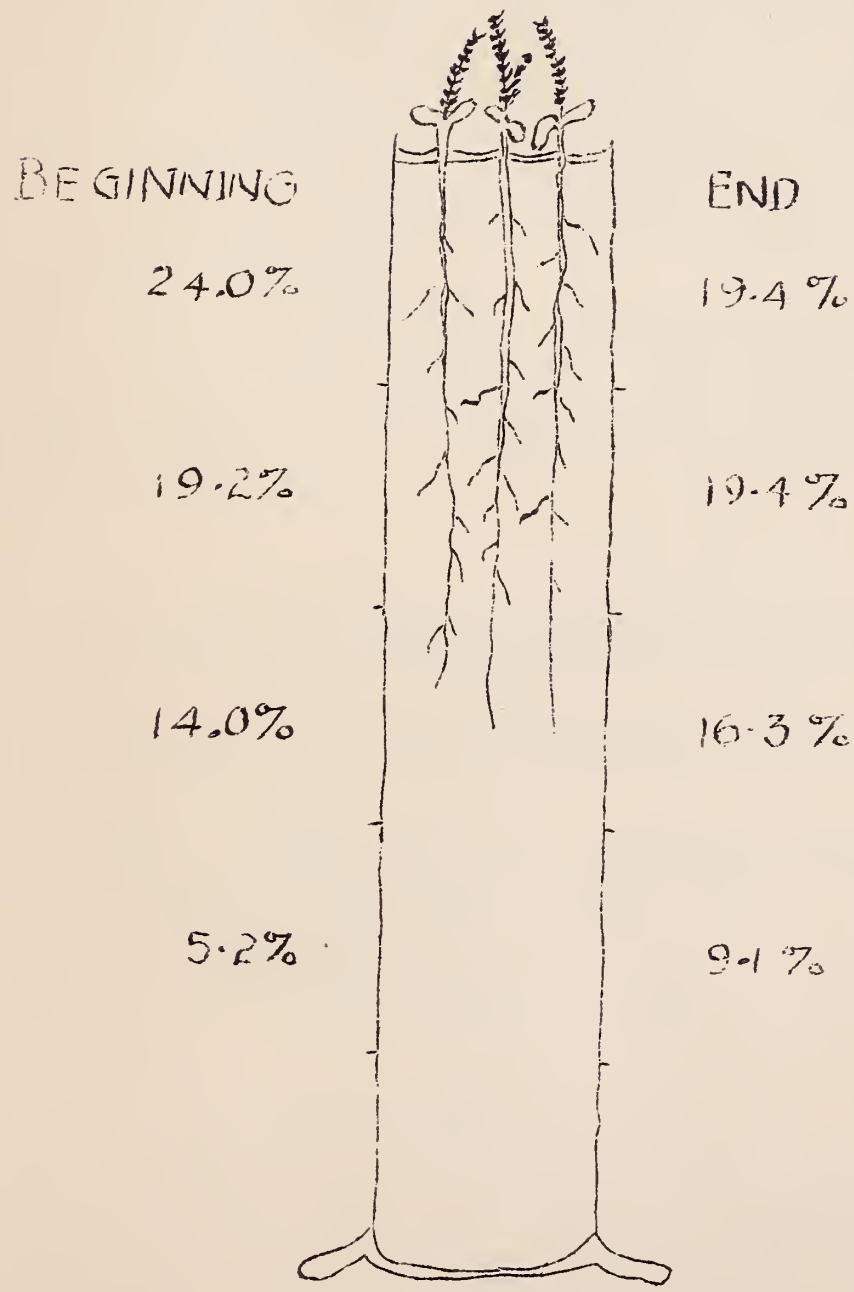
Elongation ceased after all the available water in the top layer had been exhausted. The roots had penetrated well into the 14 per cent layer. The cylinder was then emptied and the amount of water left in each layer determined. On the right of the cylinder these percentages are shown. It will be seen that there was a loss in the top layer, but a build-up in all the others. This build-up was caused largely by evaporation and condensation, or by a transfer of water in the vapor phase.

However, the roots were growing in a soil at 16.3 per cent moisture, or 5.2 per cent below the wilting point of the soil.

This same phenomenon has been observed in the field by Crider, at Superior, Arizona. He dug down into the soil beside palo verde seedlings and followed the roots 2 feet into a soil very much below the wilting percentage.

J. F. Breazeale.

Tucson, Ariz.


BEGINNING
END
24.0%
19.4%
19.2%
19.4%
14.0%
16.3%
5.2%
9.1%

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXIV January 30, February 6 and 13, 1932 No. 3

Belle Fourche

Under date of February 2, Mr. Beyer Aune reported as follows:

"We had a real touch of winter during January, with considerable snow and the temperature down to 21° below zero.

"There is plenty of feed on the project to take care of the stock, but out on the range where there is more snow the feed situation might be really serious. Reports indicate that conditions are very bad east of here in the area that was cleaned out by the grasshoppers and injured by drought. The people are being cared for through various sources of relief.

"The lambs are doing well. When they were all weighed on January 30 it was found that all the lots had made an average gain of 30 pounds in 107 days. The smallest gain was made in lot 3, which was fed 2850 pounds of barley. Lot 2, which was fed barley and alfalfa screenings, made the best gain."

Prosser

A small amount of snow fell during the latter part of the week ending January 30. There are 111 inches of snow in Snoqualmie Pass of the Cascades.

A summary of the weather conditions for January 1931 as compared with January 1932 follows.

Year	Maximum	Minimum	Mean Maximum	Mean Minimum	Mean	Greatest daily range	Hourly wind velocity, miles	Total precipitation, inches
1931	58.5	12	41.9	29.1	35.5	29.5	0.92	0.095
1932	54.0	8	35.7	21.3	28.5	23.5	1.98	.48

During the month of January this year five days were clear and 13 were cloudy and partly cloudy.

There was an increase of 6,037 acre-feet of water in the government reservoirs during the week, making the total holdings 152,117 acre-feet as compared with 152,157 acre-feet held last year at this time. The snow was 72 inches deep at Lake Keechelus and 53 inches deep at Lake Kachess, both of which are reservoirs east of Snoqualmie Pass.

Lamb Feeders' Day was held at the station on January 23. Due to the inclement weather the number of visitors was small.

The prices for beef and pork declined 75 and 25 cents per hundredweight, respectively. Spring lambs are holding steady at $4.00.

The price of alfalfa hay is $8.50 to $10 a ton, but there is very little activity in the hay market. Good hay can be bought for

Prosser (cont'd)

$4.00 to $5.00 a ton in the stack. Potato markets are showing little or no activity and the holdings are rather large. The demand is very low and consignment shipments are resorted to in order to move the crop. Grading rules for potatoes are very rigid and only the very best are sold. Onions are $90 a ton, but Yakima Valley onions do not sell readily after the first of the year because of their doubtful keeping quality.

Lambing has begun at the station and will be well advanced next week.

The total precipitation for the week ending February 6 was .18 of an inch. A minimum temperature of 3° below zero on February 3 was the lowest of the season.

The price of average large white eggs has increased 2 cents a dozen. The latter part of the week potato prices declined and are now quoted at $10 to $11 a ton for U. S. No. 1's sacked. The price of hops ranges from 10½ cents to 12½ cents a pound, more recent sales being made at 11 cents a pound. Stocks on hand on the Pacific Coast February 1 amounted to 42,192 bales. Of this number 18,876 were in Oregon, 15,176 in California, and 8,147 in Washington of which 5,629 bales are in the Yakima Valley.

The third annual Young Farmers' Conference was held in Yakima February 5 and 6. About 300 or 400 farmers throughout the Yakima Valley attended the meeting and discussed problems dealing with soil fertility, irrigation, and marketing. In view of the fact that the prices of farm produce were so low, the farmers decided to place special emphasis on lowering the cost of production. Orchard men have set top wages for orchard laborers at 25 cents per hour.

The weather moderated during the first part of the week ending February 13, the maximum temperature being 47°. This caused a general thaw, which released considerable run-off water. The temperature declined the latter part of the week, reaching a minimum of 16.5°. A light snow resulted in .08 inch of precipitation. Recent snows in the mountains have increased the amount of snow in Snoqualmie Pass to 134 inches.

Prices of produce have not changed. Producers are thought to be buying for their immediate needs only; therefore, the trading fluctuates considerably.

Work is progressing rapidly on the canal near the Prosser dam. Two gas shovels are doing the excavating.

The lambing season at the station is about half finished, and up to the present time the new lambs number 55.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending January 30 was 31°, with a maximum of 44; the average minimum was 5, with a minimum of 6 below zero. The average wind movement was 10.1 miles per hour. No precipitation was recorded during the month.

Scotts Bluff (cont'd)

The week has been so cold and windy that little work has been done except caring for the stock. Some fertilizing was done on the Walker place.

Mr. Smith, dairyman at the Ardmore station, visited this station during the week. An effort had been made to get the Ardmore station to furnish some bulls for dairymen in the valley, and Mr. Smith was here to confer with the county agent regarding the transfer.

Prices of all farm products are still working downward. Butterfat has dropped to 17 cents; eggs are holding steady at 15 cents. Saturday tops at Omaha were: $7.25 for fat steers, $6.10 for lambs, and $3.65 for hogs.

No announcements have yet been made regarding the beet contracts for the coming year.

The results from the poultry plant at this station for the 12 months ending August 31, 1931, are summarized in the following table:

Average number of hens	374
Total number of eggs	61,225
Eggs per hen	164
Average price per dozen	.172 ¢
Value of eggs sold	$877.29
Surplus stock (including turkeys)	356.88
Total income from plant	$1,234.17
Total cost of feed	$497.27
Cost of supplies	54.53
Stock purchased	31.20
Total cost	583.00
Total income above cost	$651.17
Feed cost per dozen eggs	.0975
Total cost per dozen eggs	.114
Feed cost per hen	1.33
Total cost per hen	1.56
Gross income per hen (excluding turkeys)	2.87
Net income per hen (" ")	1.31

The average maximum temperature for the week ending February 6 was 31°, with a maximum of 48; the average minimum was 12, with a minimum of 3 below zero. The average hourly wind movement was 11.3 miles. A 3-inch snow resulted in a precipitation of .20 inch, making a total of .27 inch for the year.

January was considerably colder than that month was last year. The average maximum for the month was 33° as compared with 46° last year, and the average minimum was 9° as compared with 14° last year. Subzero temperatures were recorded five nights during the past month.

The recent visit of Mr. Smith, the dairyman from the Ardmore station, resulted in satisfactory arrangements for the furnishing of bulls to the dairymen in the valley. Some bulls have already been brought in and others will follow. The dairy situation in the valley is the brightest spot in the farm program. While the price of butterfat is very low, the dairymen who have carefully culled their herds and are feeding home-grown grains and roughage are getting a much bet-

Scotts Bluff (cont'd)

ter price for these crops than the market would pay. The price of butterfat has advanced a cent the past week.

Alfalfa hay prices have stregthened and practically all hay is being held for $7.00 a ton. Prices of other farm commodities have been about the same as last week.

The average maximum temperature for the week ending February 13 was 45°, with a maximum of 58; the average minimum was 21, with a minimum of 4°. The average hourly wind movement was 12.2 miles. No precipitation was recorded.

The North Platte Valley Poultry Marketing Association held its annual meeting at Torrington during the week. The old officers were reelected. The report of the officers showed a very satisfactory growth in operation. During the season 442,737 pounds of turkeys were sold through the association for a total of $98,606, at a net price to the growers of about 22½ cents per pound, after 2 cents had been deducted by the association. The birds were marketed at the lowest cost in the association's history, namely, .91 of a cent a pound. One-fourth of a cent a pound will be refunded to the growers for all turkeys sold during the past two seasons. The association now has 740 members and is in a very flourishing condition. All bills are paid and the treasury has a balance of over $9,000.

The Cooperative Cheese Company has commenced to ship butter in car-lots to the eastern markets, where prices are better than on the local market.

A meeting of the members of the various irrigation districts and water-users in the valley met at Mitchell during the week to take steps to protect their rights to the waters of the North Platte River. The State of Colorado is now working on a project whereby the waters of the North Park area in that State, which have always flowed into the North Platte River, will be diverted from that stream through a tunnel under the Medicine Bow Range to the Poudre River to be used on lands that now have a scanty water supply. Attorney General Sorensen of Nebraska attended the meeting.

There has been little change in the prices of livestock.

James A. Holden.

Yuma

Under date of February 2, Mr. E. G. Noble reported as follows:

"Another cold wave on January 25 gave our citrus trees another shock. A minimum temperature of 19 was recorded on that date. This freeze together with the 21° temperature of November 21 has taken just about all the foliage off the trees.

"All the fruit from the grapefruit plantings around Bard has been marketed, the growers receiving $20 a ton delivered on the truck at the orchards. About 50 tons were picked from the 21 acres of four year old trees. Practically all the fruit to be marketed independently has been harvested. This represents about half the plantings in Imperial County. The associations are picking on orders only. Prices have been advancing the past month."

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIV February 20 and 27, 1932 No. 4

Belle Fourche

Under date of February 24, Mr. Beyer Aune reported as follows:

"Lamb Feeders' Day was held on February 17. About 50 people attended. A lamb dinner was served at noon. The lambs were shipped to Sioux City on February 19 and sold on the following Monday at $6.35 per hundredweight, which was the packer top for that day.

"The lambs were separated into lots and butchered, so that dressing weights and grades can be obtained on each lot. The man in charge of the grading was very much pleased with the appearance of the dressed lambs, all lots grading well to the top.

"I returned from Sioux City today and have to prepare a report on the lamb feeding for the West River Institute, which is to be held at Belle Fourche on February 26 and 27."

Newlands

The average maximum temperature for the seven-week period ending February 27 was 39, with a maximum of 56 on February 25; the average minimum was 18, with a minimum of 1 on January 14. The mean temperature was 28.5. The average hourly wind movement was 2.5 miles. The precipitation amounted to 1.34 inches.

The continued freezing weather has retarded field work to some extent. Usually in former years the ground has been in shape for plowing early in February. This year it has been frozen to such a depth that it has been impossible to plow. However, during the last few days there has been an indication of thawing. As soon as possible the plots to be seeded to grain will be prepared.

There is sufficient snow in the mountains to supply plenty of irrigation water. The water in Lahontan Dam is steadily increasing, although very little of the total water that will be shed from the snow pack has reached the dam.

With the exception of hay, the prices for farm products have increased very little. At present hay is bringing $10 a ton in the stack. The small crop of hay last year together with the amount being fed by range men to bring their stock through the heavy winter storms has caused a shortage.

The orchard at the station has been pruned. Several trees have been removed, principally apples and pears that had died or become badly diseased by blight. A shipment of 93 trees (nectarines, apricots, peaches, and plums) has been received from the Government Plant Introduction Gardens at Chico, California. As soon as weather conditions permit they will be planted. These varieties have been selected with a view to determining their sensibility under local conditions.

E. W. Knight

Prosser

The first part of the week ending February 20 the minimum temperature declined to 16.5° and continued to hover around 20 throughout the week. The maximum temperature rose from 36.5 on February 18 to 52.5 on February 20. The greatest daily range was 22.

Arrangements have been made to ship next week the rest of the sheep being fed on contract.

Potato prices have advanced and are now quoted at $11 to $12 per ton for U. S. No. 1's in sacks.

Report for week ending February 27

The warmest February day on record at this station occurred on February 26 when the mercury rose to 69°. The greatest daily range for the week was 24.5°. A precipitation of .11 inch of rain was received in one shower during the week. The warm temperatures caused a heavy run-off from melting snows in the mountains, and the Yakima River was brought up to high water stage. On February 26 there were 90 inches of snow in Snoqualmie Pass in the Cascades.

The sheep that were fed on contract at the station this winter were shipped on February 23. Approximately 100 spring lambs are at the station now.

The price of butterfat has decreased from 20 cents to 19 cents a pound and potatoes to $10 a ton for U. S. No. 1's sacked. The best lots of potatoes will sell for $12, which is the top price. Shipments of produce from the Yakima Valley in carload lots for the week ending February 25 in 1931 and 1932 were as follows:

	1931	1932
Apples	495	325
Mixed fruit	4	3
Pears	27	15
Onions	5	10
Potatoes	117	115
Vegetables	4	11

Carl A. Larson.

San Antonio

Report for the four-week period ending February 13
(Note: This report was not received in time to include it in the previous issue.)

The winter in the San Antonio region so far has been very mild. The minimum temperature of 27°, which occurred during the last week of January, has been reached on only one occasion. In many parts of San Antonio and also in protected areas in the surrounding country the leaves of such tender plants as castor beans, cannas, and bananas have not been frozen. The mean temperature for January was 3.2° above the 24-year normal.

The aspect of the sky has been mostly cloudy with scattered showers much of the time. Only eight days of the first 45 of this year have been recorded as clear. The precipitation during January was three times the normal for that month. The total rainfall for the first two weeks of February has been very light even though some precipitation was recorded on six different days. All small grains have made abundant growth and are now supplying excellent pasturage.

San Antonio (cont'd)

Field work during this period has included planting oats in field AB-8, planting time-of-planting flax plots in A-3, trimming small grain and flax plantings to conform to field lines, cultivating and weeding nurseries, disking rotation plots and field C-4 to control volunteer grains, and pruning and spraying orchards and vineyards.

Summary of Meteorological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
Jan. 23	75	67.0	36	51.4	59.2	29	.08	0	2	5
" 30	72	59.0	27	35.0	47.0	35	.21	2	3	2
Feb. 6	79	68.3	35	44.6	56.4	36	.17	0	3	4
" 13	86	79.4	46	56.6	68.0	31	.08	0	5	2
Month of January	79	65.4	27	43.5	54.5	35	3.70	8	7	16

Dr. D. C. Neal, Senior Pathologist, Division of Cotton, Rubber, and Other Tropical Plants, visited the station on January 19.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending February 20 was 39°, with a maximum of 54; the average minimum was 12, with a minimum of 4. The average wind movement was 8.7 miles per hour. The snow flurries during the week were not sufficient to measure.

Unofficial reports from the North Platte watershed are very encouraging. The amount of snow at this time in central Wyoming is above the average. It is predicted that the Pathfinder will have a greater storage than last year, and there may be an overflow.

The Poultry Association has received an additional payment of 2.4 cents a pound for the turkeys sold in January. This payment, together with the one-fourth of a cent refund ordered at the recent annual meeting, will aggregate about $5,500 to the growers.

The first of the week the Great Western Sugar Company began a series of meetings with growers for the purpose of stimulating production, but after holding sessions two days all dates were cancelled. Then the Company announced from Denver that it would not guarantee any price for the 1932 crop. The inference was that beets would be paid for at such prices as the price of sugar would warrant at harvest. That means that the present sliding scale will be used but without any guarantee as to the minimum price. Growers are anxiously awaiting further statements from the Company.

Two cars of steers were shipped from the station to Chicago this week. They were in prime condition and averaged over 1400 pounds.

Prices have changed very little during the past week. Prices for fat lambs have made a slight advance.

The rest of the corn crop was put into the silo during the week.

Scotts Bluff (cont'd)

The average maximum temperature for the week ending February 27 was 62°, with a maximum of 71; the average minimum was 28, with a minimum of 21. The average wind movement was 8.4 miles an hour. No precipitation was recorded.

The past week has been very favorable for the beginning of farm work and much has been accomplished. Some plowing has been done, and many farms have been fertilized and disked in preparation for plowing. Hauling manure has been the only work at the station with the exception of the regular routine.

The steers shipped to Chicago brought the top price of $8.25. They averaged 1430 pounds out of the feed-lot and 1345 pounds at market—a shrinkage of about 6 per cent. The feeding operation showed a small profit.

The Great Western officials have made no further pronouncements in the 1932 sugar beet controversy, and all others who are making predictions are basing them on hope rather than on knowledge. The Holly Sugar Company, operating in Wyoming, have made as yet no contracts and no statements relative to the 1932 price. Many farmers are going ahead with the preparation of their land, hoping that they will be offered contracts later.

The movement of livestock out of the valley is a little larger this year than last. Up to February 20 the Scottsbluff section had shipped out 510 cars of lambs as compared with 452 cars last year. The price of cattle is bringing out some fat cattle from this section. The price of fat lambs has also strengthened, and feeders have made some profit on their operations. The week closed with a top price of $6.75.

Butterfat remains steady at 18 cents, but eggs have declined to a record low level for this time of the year. At the close of the week eggs were selling at 3 dozen for 25 cents. This is considerably below the cost of production.

James A. Holden

M I S C E L L A N E O U S

"Irrigated Crop Rotations in Western South Dakots," by Stephen H. Hastings and Beyer Aune, has been published as Circular No. 188.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV March 5 and 12, 1932 No. 5

Belle Fourche

Report for the month of February

The weather during the first three weeks was comparatively cold, subzero weather being recorded on nine days. The remainder of the month was unusually warm and the mean temperature was one degree above normal. The last week in the month was much warmer than any other week of February on record at this station. The maximum temperature was 69° on the 27th. The temperature remained above freezing for six consecutive days, the daily minimum ranging from 34 to 40. In the 23-year period preceding 1932 there have been only five days with a minimum above freezing. The total precipitation for February was .07 inch, only .40 inch having been recorded since January 1. This is more than 50 per cent below normal.

On Lamb Feeders Day, which was held at the station on February 17, one lamb was butchered from each lot for a carcass demonstration, showing the degree of finish in each lot. The West River Farm Development Institute was held at Belle Fourche on February 27, at which time the lamb carcasses were sold at auction. They brought an average price of 36 cents a pound. The highest sold for 45 cents and the lowest for 32½ cents.

During the week ending March 12 the maximum temperature was 15° and the minimum -15°. The precipitation was .03 inch. From March 4 to March 12, inclusive, the temperature was below zero. This was the longest period of zero weather in March ever recorded at this station. The worst storm of the year was on March 8, with a temperature of -12° and an unusually high wind with some snow and moving soil.

The Sugar Company is still working on a contract for this year's crop of beets. Although they have not yet made a definite statement, the contract will be on a share basis. The company will take the beets and give the grower one-half of the sugar manufactured. The price paid per ton for beets will depend entirely on the price of sugar during the coming year. While this is rather indefinite, it appears that sugar beets will be about as profitable as any other crop that can be grown this year.

Beyer Aune.

Prosser

Report for the week ending March 5

A snow fell at the station March 2, but it melted very rapidly. The total precipitation for the week amounted to .07 of an inch. The maximum temperature was 60.5, the minimum 25.5, and the greatest daily range 26.5°.

Prosser (cont'd)

Comparison of the weather conditions for February 1932 with February 1931.

Year	Temperature				Hourly wind velocity	Precip-ita-tion	Aspect of the sky (days)		
	Max-imum	Min-imum	Mean max.	Mean min.			Clear	Partly cloudy	Cloudy
					Miles	Inch			
1932	69	-3	42.8	25.8	3.08	0.37	5	16	8
1931	62	17	48.4	27.7	1.14	.02	7	12	9

The Yakima River is still at high water stage, but the water level is a little lower than it was last week. New snow in Snoqualmie Pass amounted to 10 inches, bringing the total to 99 inches.

Spring work is progressing rapidly. Field E-8 of the irrigation plots is being manured in preparation for wheat planting. Head lettuce was planted the latter part of the week. Flume repairing has begun. A meter box is being installed at the pipe line intake on the west ditch, which is supplied by water from headgate No. 1. Another box equipped with risers will be placed at the southwest corner of the apple orchard to divert water into the pipe line on the north side of the pear orchard.

Livestock prices the past week have been steady. The top prices in the Yakima Valley are as follows: Prime steers, 800-900 pounds, $4.75; prime heifers, 600-800 pounds, $4.25; calves, up to 225 pounds, $6.00; choice hogs, 160-200 pounds, $4.50; and prime spring lambs, 70-85 pounds, $5.00.

Prices for farm produce are as follows: Hay, $8.50 to $10 a ton; potatoes, U.S. No. 1, $10 to $11 a ton; wheat, 60 cents a bushel; hops, 11 to 12½ cents a pound; and butterfat, 19 cents a pound.

Last year the average value per acre of all crops in the Sunnyside division of the Yakima project was $32.12. Hops gave the highest per acre value—$284.62, followed by asparagus, which was valued at $210.75 per acre. The respective acreage for these crops was 121 and 543.

During the week ending March 12 the maximum temperature was 53°, the minimum 20.5°, and the greatest daily range 28.5°.

The cold temperatures the latter part of the week reduced the amount of run-off water in the Yakima River, but the water in the river is still quite high.

Fields A-10 and C-5 have been plowed and will be seeded to sweet clover and the cereal nursery, respectively. Weed burning has progressed as rapidly as weather conditions would permit. Heavy frosts have hampered field operations during the early part of the day.

The construction work on the new canal near the Prosser Dam has been progressing rather slowly because of the large amount of solid rock in that area.

Egg prices are now 15 cents a dozen for average large white eggs. The price of spring lambs, 75-90 pounds, has gradually increased since the first of the year. The price advanced 50 cents per hundred during the last week and is now $5.50 per hundred. The price of choice hogs, 180-200 pounds, has continually declined since

Prosser (cont'd)

the first of the year and only recently has shown a tendency to increase. The station has been offered $3.00 a hundred for feeder pigs, but it is doubtful whether it will be profitable to feed them even with feed prices at the present low levels.

Carl A. Larson.

San Antonio

Report for the two-week period ending February 27

The warm, cloudy weather which has persisted during the entire winter continued through February. The mean temperature for the month was 6.3° above normal, which is the highest mean recorded for February during the past 25 years. The absolute minimum for the month establishes two new station records: It is 3° higher than any previously reported February minimum, and it is the first time no freezing temperature occurred. Although cloudy or partly cloudy weather prevailed and a measurable amount of precipitation was recorded for eight separate days, the total for the month was only .24 inch above normal.

Winter grains, although planted unusually late owing to the protracted fall drouth, have taken advantage of the combined warm weather and adequate moisture supply and have furnished abundant pasturage throughout the month. A relatively large percentage of this year's corn crop in this region had been planted by the end of February.

Summary of Climatological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inch	Days	Days	Days
Feb. 20	79	65.7	44	54.9	60.3	21	1.73	0	0	7
" 27	84	69.9	39	43.6	56.7	38	.0	3	2	2
Month of Feb.	88	72.3	35	50.6	61.4	38	1.87	4	11	14

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending March 5 was 42°, with a maximum of 61; the average minimum was 14, with a minimum of 4 below zero. A 2-inch snow the latter part of the week resulted in a measured precipitation of .18 inch. The average wind movement was 11.5 miles per hour.

The past winter has been more rigorous than the winter of 1930-31. Subzero temperatures have been recorded in each of the last three months, while zero was not reached at all during the same months last year. The mean temperature for the three months this year was 27° as compared with 30° last winter. This winter showed considerably more moisture, 1.02 inches, as compared with .09 inch for 1930-31, but as the snowfall came with high winds it was drifted so badly that it has been of little benefit to the soil. The total snowfall for 1931-32 (December, January, and February) has been about 10 inches. The

Scotts Bluff (cont'd)

average hourly wind movement for the three months has been 8.4 miles as compared with 6.7 miles for the same period last year.

The first part of the week was favorable for farm work. The station joined in the drive against unemployment by giving work to four men; and a considerable start was made toward cleaning out all corrals and fertilizing the fields. The storm the latter part of the week stopped this work.

The beet sugar situation in this section has not changed. It is reported that the American Sugar Company in the eastern part of the Platte Valley has agreed to offer the same contract that was used last year. The Great Western and the Holly Companies, however, have given no indication of their position. The Colorado division of the Mountain States Association is still hopeful that a minimum price will be offered. In the Nebraska section it is believed that no minimum price will be offered, but only an offer to share the receipts, whatever they may be.

Lamb shipments have eased off a little the last week. The price has been gradually working up, which is giving some encouragement to shippers. Hog prices are also reaching higher levels. A carload of well-finished hogs sold on the local market Saturday for $4.10, which was only 10 cents below the Omaha top for that day. Egg prices are now down to from 5 to 7 cents a dozen. Butterfat dropped to 16 cents, but the local creamery is promising a bonus of 5 cents for sweet cream from now on.

The average maximum temperature for the week ending March 12 was 17°, with a maximum of 35; the average minimum was 5° below zero, with a minimum of 9 below. There has been no precipitation. The average hourly wind movement was 10.6 miles.

This has been the coldest week ever recorded at the station during the month of March. The average maximum for the first six days of the week was only 13½° above zero. There were snow flurries on four days and considerable wind. A very severe dust storm occurred on the 8th. It blew all of the snow into drifts and then covered the drifts with sand. It was not possible to do anything but routine work during the week.

Earlier reports received by officials of the Pathfinder Irrigation District that in all probability the Pathfinder Reservoir will be filled this spring have been confirmed. From 1 to 2 feet of snow fell in the Platte watershed in Wyoming during the last week or two. With anything like the normal precipitation, the water situation will not be critical this year.

The following table gives a summary of the steer-feeding experiment that was conducted at this field station during 1931-32.

Scotts Bluff (cont'd)

Items	Lot 1	Lot 2	Lot 3	Lot 4
Number of steers in each lot	8	8	8	8
Number of days on test	186	186	186	186
Initial weight ..... lbs.	8,420	8,390	8,430	8,410
Final weight ..... "	11,444	11,298	11,414	11,544
Total gains ..... "	3,024	2,908	2,984	3,134
Gains per steer ..... "	378	364	373	392
Average daily gain ..... "	2.06	1.96	2.00	2.11
Feed consumed:				
Wheat ..... lbs.	9,468	6,289	9,416	9,468
Corn ..... "	9,468	6,289	--	--
Barley ..... "	--	6,289	9,416	--
Pulp ..... "	--	--	--	9,468
Cake ..... "	1,250	1,250	1,250	--
Corn silage ..... "	24,080	23,200	23,200	24,080
Alfalfa hay ..... "	5,170	5,180	4,450	5,520
Feed consumed per 100 pounds gain:				
Wheat ..... lbs.	313	216	315	302
Corn ..... "	313	216	---	---
Barley ..... "	---	216	315	---
Pulp ..... "	---	---	---	302
Cake ..... "	41	43	42	40
Corn silage ..... "	796	798	778	768
Alfalfa hay ..... "	171	178	149	176

James A. Holden.

Yuma

The mean maximum temperature for the week ending February 20 was 61, the minimum 43, and the greatest daily range 49. For the week ending February 27 the maximum temperature was 87, minimum 37, and the greatest daily range 41; the mean maximum was 80 and the mean minimum 45. No precipitation was recorded.

Station work for the two-week period has consisted of a general cleaning up, making cement floor in the pump house, hauling manure, and moving ornamental trees.

The alfalfa on the station will be ready to cut in a few weeks. The first cutting of alfalfa on a limited area of the project was made during February.

Practically all of the 1931 cotton crop has been ginned. From the nine gins which have operated on the project a total of 14,770 bales have been reported. In 1930 29,811 bales were produced, or 15,041 bales more than in 1931. The fact that in 1930 28,072 acres were in cotton and only 19,895 in 1931 accounts principally for the difference in the number of bales produced in the two years, but it is also due in part to the low yield of cotton in 1931.

Yuma (cont'd)

Average yields of seed cotton (pounds per acre) in the irrigated rotations on the Yuma Field Station, 1923 to 1931, inclusive.

Rot. No.	1923	1924	1925	1926	1927	1928	1929	1930	1931	Average	Rank
4	764	784	1272	1674	1038	1272	1058	1216	1055	1126	29
5	1252	956	2552	2428	1722	1804	2040	2092	1407	1806	6
6	728	800	996	1470	734	1188	918	1384	756	997	32
7	744	600	1016	1440	778	1124	1180	1464	1035	1042	31
7-a	--	--	--	--	--	1580	1726	1968	1340	1654	13
7-b	--	--	--	--	--	1808	1468	2068	1333	1669	12
20	644	824	1964	1278	1586	720	1642	1068	1062	1199	26
22	636	592	1144	1076	850	688	1154	832	743	857	33
23	844	1032	1416	1900	1172	1188	1206	1288	474	1169	27
30	456	280	1032	1044	664	988	696	612	713	721	34
31	--	--	--	--	--	1324	1500	1860	1070	1439	20
34-1	--	--	--	--	--	1992	2410	1932	994	1832	5
34-2	--	--	--	--	--	1996	1514	2104	888	1626	15
36-1	--	--	--	--	--	2024	2156	2224	1262	1937	2
36-2	--	--	--	--	--	2160	1546	2004	998	1677	11
40-1	884	784	2596	2758	1146	872	1940	2420	1085	1609	16
40-2	772	520	852	2359	1504	944	1038	2064	1236	1254	24
44-1	1008	2136	1848	1979	1624	2136	1512	1692	1471	1712	10
44-2	980	984	2268	1624	1056	1044	1830	1328	785	1322	22
46	1244	1144	1104	1992	1614	2160	1114	1604	1293	1374	21
50	728	672	1116	1460	840	1192	1352	1576	*1291	1136	28
52	684	808	2680	1846	922	1100	1450	2212	1271	1441	19
54-1	--	--	--	--	--	1996	1990	2244	1438	1917	3
54-2	--	--	--	--	--	1972	1782	1872	1514	1785	7
56	--	--	--	--	--	2028	1816	2544	1730	2029	1
60-1	688	904	1100	1717	1466	1164	1144	1628	1122	1215	25
60-2	420	600	948	1554	842	1424	1042	1580	976	1043	30
61-1	672	832	1632	2044	2026	1376	1722	1740	1258	1534	17
61-2	792	708	984	1462	1160	1940	1602	1732	1090	1276	23
63-1	1064	1948	1660	2490	1864	1584	1436	2220	1360	1736	8
63-2	732	1070	1620	1790	1280	1620	1632	1972	1232	1439	20
64-1	--	--	--	--	--	2040	1360	2164	1502	1893	4
64-2	--	--	--	--	--	1784	1604	2040	1149	1644	14
64-3	--	--	--	--	--	1904	1412	1700	1066	1521	18
65-1	--	--	--	--	--	2076	1346	1988	1521	1733	9
65-2	--	--	--	--	--	1944	1474	1884	1133	1609	16
Maximum	1252	2136	2680	2758	2026	2160	2410	2544	1730	2029	--
Minimum	420	280	852	1044	664	668	696	612	474	721	--
Average	797	904	1514	1780	1233	1548	1509	1787	1143	1470	--

*Corrected for a short plot and the influence of a row of date trees.

Max E. Crannell.

M I S C E L L A N E O U S

SALT BALANCE OF THE IMPERIAL VALLEY

The results of the second year's study of the salt balance of the Imperial Valley of California are summarized in the following communication to Mr. M. J. Dowd, of the Imperial Irrigation District.

Mr. M. J. Dowd
Imperial Irrigation District
Imperial, California

Dear Mr. Dowd:

We have now completed the analyses of the 52 sets of samples that comprise the second year of observations on the salt balance of the Imperial Valley. The observations for the first year were reported to you by letter dated March 13, 1931.

The procedure followed as to collecting samples and reporting discharges has been the same for both years; consequently, in addition to reporting the results for the second year, it is possible to make direct comparisons with the results reported for the first year.

The cumulative results for the 52 weeks ending February 26, 1931, and for the corresponding period ending February 25, 1932, are summarized in the following table:

	Discharge			
	Acre-feet		Tons salts	
	1931	1932	1931	1932
Irrigation water	2,646,914	2,213,986	3,212,967	2,952,348
Drainage water...	1,067,821	857,766	2,112,190	1,881,321
Residue.	1,579,093	1,356,220	1,100,777	1,071,027
% Residue	59.7	61.2	34.3	36.3

This summary and comparison shows that for 1932 slightly less water was brought into the valley than in 1931 and also that slightly less water was discharged as drainage. Also, less salts were brought in during 1932 than in 1931 and less carried away in the drainage. The percentage of the irrigation water actually consumed in the valley was slightly higher in 1932 than in 1931, as was also the percentage of total salts that remained in the valley.

It is possible to compute from the data available the weighted mean composition of both the irrigation and drainage waters for the two years. These weighted means are given in the following table:

Item	Year	Total salts p.p.m.	Milligram equivalents					
			HCO_3	Cl	SO_4	Ca	Mg	AB
Irrigation water	1931	892	3.09	2.91	7.21	4.87	2.81	5.52
Irrigation water	1932	980	3.26	3.78	7.76	5.09	2.97	6.81
Drainage water	1931	1454	3.55	9.76	9.34	6.74	4.47	11.44
Drainage water	1932	1612	3.59	11.46	9.76	6.86	4.71	13.60

Salt Balance of the Imperial Valley (cont'd)

It is evident from this comparison that both the irrigation and drainage waters were more saline in 1932 than in 1931. This condition was probably consequent upon the lower discharge of the Colorado River during the latter season.

It will be observed also that while the total salinity of the irrigation water is to the total salinity of the drainage water as 1 is to 1.63 for 1931, and as 1 is to 1.65 for 1932, the ratios with respect to the chlorides were much higher. In 1931 the ratio of chloride in the irrigation water to chloride in the drainage water was as 1 is to 3.55, while in 1932 the corresponding ratio was as 1 is to 3.03. Thus it is apparent that the drainage water is carrying away from the valley a higher proportion of chloride than is being brought in by the irrigation supply.

In order to show more precisely the balance of the various salt constituents as between inflow and outflow, I have computed again this year, as I did for last year, the tonnage of each constituent carried in the irrigation supply and in the drainage discharge. These results are given in the following table:

Item	Constituents in tons, 1932						
	HCO_3	Cl	SO_4	Ca	Mg	AB	Totals
Irrigation	299,542	403,846	1,121,676	306,642	108,735	471,817	2,712,218
Drainage	127,729	474,789	546,758	160,034	66,710	365,041	1,740,461
Residue	171,813	-70,943	574,918	146,608	42,025	106,776	971,757
% Residue	57.4	-17.6	51.2	47.8	38.6	22.6	35.8
% Residue 1931	53.5	-35.4	47.7	44.2	35.8	16.5	31.8

This table shows again, as did the corresponding table in the report for 1931, that the salt constituents carried away in the drainage water are different in proportions from those brought in by the irrigation supply. The most striking difference is with respect to the chlorides. This is the only constituent that has a larger tonnage in the drainage discharge than in the irrigation supply. In other words, the salt balance for the valley is again favorable with respect to the chloride constituent.

Last year the chloride content of the drainage water exceeded that of the irrigation supply by 131,619 tons, which is equivalent to 216,908 tons of sodium chloride or common salt. This year the favorable balance is 70,943 tons of chloride, equivalent to 116,914 tons of sodium chloride.

Very truly yours,

C. S. Scofield

Rubidoux Laboratory,
Riverside, California,
March 14, 1932.

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"Crop Rotation and Tillage Experiments at the San Antonio (Texas) Field Station," by George T. Ratliffe and I. M. Atkins, has been published as Circular No. 193 of the U. S. Department of Agriculture.

"Irrigation and Related Cultural Practices with Cotton in the Salt River Valley of Arizona," by Stephen H. Hastings, has been published as Circular No. 200 of the U. S. Department of Agriculture.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV March 19, 1932 No. 6

Huntley

During the three-week period ending March 19 the total precipitation amounted to 2.37 inches, mainly in the form of snow. The maximum temperature was 56 and the minimum -37. During the ten days from March 4 to March 13, inclusive, the minimum temperature ranged from -14 to -37.

This was one of the most severe March storms on record in this section and resulted in rather serious losses to range stock that were already in poor condition due to a shortage of winter feed. The unusually heavy rainfall will be of benefit to range and dry lands.

No contract has as yet been offered to growers by the local sugar company, although it appears probable that a contract similar to one issued by some other beet sugar companies will be given out. Most of these companies do not guarantee a definite basic price for beets, but agree to accept them at a price based on the sugar content and the selling price of sugar, with a general understanding that this will approximate $5.00 per ton for beets.

Alfalfa hay is selling at $8 to $9 a ton, butterfat at 17¢ a pound, and eggs at 9¢ to 12¢ a dozen. Great Northern beans are quoted at 80¢ a hundredweight.

Dan Hansen.

Prosser

Throughout the week ending March 19 the weather was favorable for farm work and especially for seeding. The precipitation amounted to .33 inch. The maximum temperature was 71.5, the minimum 31.5, and the greatest daily range 28.5. The warm weather accompanied by rain in the mountains has increased the flow of water in the Yakima River.

Field E-8 of the irrigation plots has been seeded to wheat, and E-9 has been manured. A-10 is being seeded to wheat and sweet clover, and nearly all of B-2 has been plowed in order to seed the same crops. The cereal nursery, operated cooperatively with the Division of Cereal Crops and Diseases of the Bureau of Plant Industry, has been planted. A new team of horses has been acquired to assist with the spring work.

Irrigation water has been diverted to the Sunnyside Canal, but the water has not yet reached Prosser. The station will not receive water for perhaps two weeks because of the construction work on the new canal at the Prosser Dam. The pipe line which carries water from the Sunnyside Canal to Prosser has been disconnected at the new canal and a new conduit will have to be constructed before the Prosser pump can operate.

New meter screens have been designed with three to four times the screening area of those previously used. Flume repairs, weed burning, and ditch cleaning were continued during the week. The cross

Prosser (cont'd)

braces of the metal flume are being straightened so that they extend straight across the top of the flume flush with the shoulders. Previously these braces dipped down into the flume about one inch, which was objectionable because they served as a catch-all for moss and weeds when the flume was full of water.

The livestock markets showed a decided upward trend during the week. Prime steers, 600-900 pounds, are $5.75; heifers, 500-700 pounds, are $5.50; calves up to 225 pounds are $6.50; and prime hogs, 160-200 pounds, are $5.00. Potatoes increased in price $2.00 per ton. Eggs and butterfat remained steady at 15¢ per dozen and 19¢ per pound, respectively.

The following table gives a comparison of shipments of produce from the Wenatchee and Yakima districts, in carload lots, for March 17, 1931 and 1932:

Seasonal Totals to Date

	YAKIMA		WENATCHEE	
	1931	1932	1931	1932
Apples	14,723	8,864	21,945	17,286
Mixed fruit	1,747	1,156	209	107
Pears	4,472	3,198	1,351	1,247
Potatoes	5,007	4,474	3	0
Vegetables	396	350	7	0
Other crops	2,973	2,578	387	316
Totals	29,318	20,620	23,902	18,956

Carl A. Larson.

San Antonio

Report for the three-week period ending March 19.

Unseasonably warm weather continued through the first week of March. A brisk "norther," which arrived on the 8th of the month, started temperatures downward and freezing weather occurred six consecutive nights. The minimum for the period, 22°, occurred on the night of March 12. Because of the unusual advance of growth made by practically all trees and shrubs during the preceding warm weather, the damage done by this sudden cold period was exceptionally heavy. Practically all growth made by citrus trees, pomegranates, and such plants since the bad freeze of January 1930 was killed. All truck crops in this region and in the Winter Garden and Lower Rio Grande Valley sections were severely damaged. Palm species which suffered great loss in 1930 appear not to have been appreciably hurt this year. An unusually large amount of corn had been planted during February in this region and practically all of it was killed.

Summary of Climatological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Abs.	Mean	Abs.	Mean			Inches	Days	Days	Days
Mar. 5	88	75.7	30	49.4	62.6	41	1.27	3	3	1
" 12	63	47.3	22	29.7	38.5	26	.03	2	1	4
" 19	89	77.0	26	42.1	59.6	41	--	3	3	1

San Antonio (cont'd)

Rotation plots of corn were planted on March 15. Milo was planted on the 16th. A test of five varieties of corn was planted in field C-4 on March 19, and a comparison of eight varieties and selections of grain sorghums were planted in the same field on the 21st.

Mr. Paul R. Dawson visited the station March 17 in connection with the studies of cotton rootrot being conducted in cooperation with the Bureau of Chemistry and Soils.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending March 19 was 56, with a maximum of 61; the average minimum was 25, with a minimum of 15°. The average wind movement was 9 miles per hour. No precipitation was recorded, though there was a trace of rain late Saturday evening.

The week has been very favorable for work. Temporary employment was given to three men. The cleaning of corrals and hauling out of fertilizer has been under way most of the week.

Sorting potatoes at the Walker potato cave was begun the latter part of the week. Potatoes made a rapid advance in price last week and are now selling for about 75¢ per hundred as against 50¢ at the beginning of the period. The major portion of the crop in this valley has been shipped; what is left is in small quantities in different parts of the section.

Some fencing has been done in order to utilize the roughage left in the fields. The work stock has been running in the fields (not the rotation plots) most of the time for the past six weeks.

Most of the sows at the station have farrowed during the past week. The litters have averaged 9 pigs each. This is rather a high percentage, but they were all gilts and careful handling has saved an unusual number.

Fat lamb prices reached the highest point for the season during the week, at the end of the week being around $7. The highest was $7.90 paid the first of the week. The price of hogs is gradually increasing and feeding operations should result in a little more profit, for corn prices are very low. Eggs remain at 7¢ a dozen, but butterfat has worked back to 18¢ for sour cream with a 5¢ premium for sweet cream.

Nothing new has developed regarding the sugar beet contract. The president of the beet growers' association has advised all members to refuse anything less than the price last year and advised them to grow only crops that would show a profit.

James A. Holden.

Yuma

The average maximum temperature for the week ending March 5 was 76.4, with a maximum of 84 on February 28; the average minimum was 45.4, with a minimum of 35 on the night of March 5. The greatest daily range of 47° occurred on March 1. There was no precipitation.

Yuma (cont'd)

The work on the station consisted of many small jobs of a general nature: cleaning out the sheep pen, hauling date leaves, repairing irrigation ditch, leveling land for cotton, and the weekly job of irrigating.

The average maximum temperature for the week ending March 12 was 82.3, with a maximum of 86 on the 7th; the average minimum was 42.4, with a minimum of 35 on the night of the 6th. The greatest daily range was 49. No precipitation was recorded.

Most of the cotton plots were irrigated on March 7. The water was measured on seven of these plots by Mr. McCormick, of the Bureau of Agricultural Engineering. The amount of water applied varied from 3.6 to 8.1 inches, depending on the condition of the ground.

The date trees on the station are a month late in blooming this year. The cool winter is probably the principal cause. Mr. Nixon, of the U. S. Experiment Date Garden, Indio, California, visited the station during the week to obtain pollen for testing.

The harvesting of the spring lettuce crop was started during the week, and more than 20 cars were shipped to market. It has been estimated that about 50 cars a week will be going out of Yuma until the harvest is completed. A poor market is reported at present. The cantaloupes will come in about the time the lettuce is finished.

The mean maximum temperature for the week ending March 19 was 82.9, minimum 46, and the greatest daily range 45. A maximum temperature of 91 was recorded on the 19th and a minimum of 42 on the 16th. No precipitation was recorded.

There was very little wind movement during the week. This was a favorable condition for the cotton planted the first of the week, as the wind would have dried the soil out before the young plants had time to root. The warm weather should bring the cotton up in record time.

The first strawberries were picked from the station patch. Judging from the number of green berries, the early crop will be good. The commercial growers made their first picking in quantity to ship.

Station work during the week has consisted of planting cotton, irrigating, cleaning up the garden and lawns, plowing the rotation and E 40-41. The plowing on E 40-41 is part of the eradication of the running mesquite. The plants among the date trees were sprayed with used engine oil.

Max E. Crannell.

M I S C E L L A N E O U S

In the following letter to Mr. Beyer Aune, under date of March 16, 1932, Mr. Scofield reported the results of salinity tests made on certain soil samples taken from the rotation series on the Belle Fourche Field Station.

"While I was at Newell last August I was impressed by the progress that had been made in reclaiming the area occupied by Rotation 40. This area had become water-logged and salty as the result

Miscellaneous (cont'd)

of seepage from the canal just above it. Then you installed some tile drainage to protect the area, with the result that its condition has improved until in parts the crop growth was nearly normal last summer, though in other places the growth was still subnormal.

"I suggested to you, in a memorandum dated August 14, that you collect two sets of soil samples in that area. The conditions of crop growth on the potato plot of Rotation 40 were then strikingly different. There was an area of poor growth near the west end of the plot and toward the east end the growth was very good. The question in my mind was as to the degree of salinity of the soil in these two areas of the plot, and as to whether or not excessive salinity was probably the cause of the poor growth.

"The soil samples were taken to represent the first foot horizon in the areas of poor and good growth. We have tested them for salinity, or the specific conductance of the saturated soil (Ks x 10^5 at 25° C.), and also for the texture of the soil as measured by the quantity of water required to saturate it. The results were as follows:

Rotation No. 40, Plot A I-2, Potatoes, 1931

	Water to saturate	Ks x 10^5 @ 25° C.
West end, poor growth		
1st foot	66%	665
2d-3d foot	66%	523
East end, good growth		
1st foot	63%	235
2d-3d foot	71%	425

"These results show, first, that as regards texture of the soil the differences between the two areas in the plot are not marked. There is, however, a marked difference in salinity, particularly in the first foot. It has been our experience that the scale of soil conductance (Ks x 10^5 at 25° C.) in relation to crop tolerance in irrigated soils is as follows:

With Ks below 200 there is no injury from salinity. Many of the well drained soils irrigated with good water show Ks below 100.

With Ks above 200 there may be injury from salinity. With Ks between 200 and 300 the injury is limited to the more sensitive crops. When it is between 300 and 400 there is likely to be injury to all but the more resistant crops. When it is between 400 and 600 injury is highly probable to all ordinary crops, and where it is above 600 only a few plants thrive.

"As measured in this scale I think we have a clear indication as to the cause of the poor growth of the potatoes in the west end of plot A I-2. The salinity of the soil is too high.

"At both ends of the plot the salinity of the subsoil is well within what we regard as the critical range. It might be interesting to explore further the conditions of the subsoil, i.e., to take separate samples to represent the second, third, and fourth foot horizons to determine if the salinity increases progressively with depth. It might be found that our crops at the south end of the rotation field are limited to the use of the upper 2 feet or 2.5 feet of the soil.

"We pass now to a discussion of conditions in Rotations 20 and 21 which lie north of the roadway. Rotation 20 consists of potatoes

Miscellaneous (cont'd)

and beets, without manure, while Rotation 21 includes the same crops but is manured every alternate year. It has been observed that the yields of Rotation 20 are much lower than those of Rotation 21, and this difference in yield has been ascribed to the manure.

"It was apparent last summer that the growth of the potato crop of Rotation 20 (plot A I-27) was not so good as that of Rotation 21 (plot A I-29) and that it was especially poor toward the west end of the plot. While there was no evidence of salt injury in this area of poor growth, it seemed advisable to take soil samples to represent the area of poor growth in Rotation 20, and for comparison to take samples from a corresponding position in Rotation 21, in which crop growth was uniformly good over the whole plot. The results of the conductance tests on these samples follow:

Rotation No. 20, A I-27, Potatoes, 1931, west end, poor growth

	Water to saturate	Ks x 10^5 at 25° C.
1st foot	72%	178
2d-3d foot	66%	365

Rotation No. 21, A I-29, Potatoes, 1931, west end, good growth

1st foot	66%	213
2d-3d foot	73%	486

"These results seem to me to indicate that the cause of poor growth in the potatoes of Rotation 20 is not excessive salinity. It is noteworthy that the conductance of the soil from the area of good growth in Rotation 21 is substantially the same as that of the soil from the area of good growth in Rotation 40. In other words, we find potatoes growing well when the conductance of the surface soil is slightly more than 200 and that of the subsoil ranges above 400. I am interested in these results because they contribute to building up a body of knowledge concerning the limits of tolerance of field crops to salinity conditions in irrigated soils.

"We expect to make some further tests on solutions obtained by digesting these soil samples with distilled water. These further tests should give us information as to the character of the salts composing the salinity and also may possibly suggest the reason for the poor growth of the potatoes in Rotation 20."

C. S. Scofield.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV March 26 and April 2, 1932 No. 7

Huntley

The maximum temperature for the week ending April 2 was 71 and the minimum was 20. The precipitation was .03 inch. The total rainfall in March amounted to 2.41 inches. This is the highest March rainfall ever recorded at this station. The normal for March over a period of 22 years is .79 inch. The rainfall was general over most of the State and will be of much benefit to ranges and dry farms.

The local sugar beet growers' association voted last week to accept the contract offered by the Great Western Sugar Company for sugar beets produced in 1932. In this contract the price paid growers for beets is based on the sugar content and the selling price of the sugar. This contract is the same as that for 1931 except that no minimum price is guaranteed by the company. Based on the present price of sugar and the average sugar content of beets, the company says that the price paid for beets would approximate $5.00 to $5.50 per ton. It appears probable that under this contract the usual acreage of beets will be grown.

Field work was started during the week in several sections of the valley. The soil is in excellent condition as a result of the recent rains.

Dan Hansen.

Prosser

Rainfall during the week ending March 26 amounted to .16 of an inch. The maximum temperature was 62°, the minimum 27, and the greatest daily range 31.5.

Water came into the Sunnyside Canal at the station on March 24 and will probably be delivered to the station next week. Flume repairing was continued.

So far this season 26 acres have been seeded to wheat and sweet clover. All the alfalfa fields have been harrowed with the springtooth.

Report for week ending April 2.

Comparison of the weather conditions for the month of March 1931 and 1932:

Year	Temperature				Mean hourly wind velocity	Precipitation	Aspect of the sky		
	Maximum	Minimum	Mean max.	Mean min.			Clear	Partly cloudy	Cloudy
					Miles	Inch	Days	Days	Days
1931	65.5	18.0	57.7	32.2	2.32	.76	7	12	12
1932	71.7	20.5	55.0	35.0	4.05	.75	2	17	12

Prosser (cont'd)

Spring work is progressing rapidly. Wheat has already emerged, and alfalfa has made a normal growth. Ninety soil samples were taken on five wheat plots and five alfalfa plots to determine the residual winter moisture as well as the moisture from previous irrigations. The station has not received water because of difficulties encountered with the Prosser pipe-line.

To determine its value as a repairing material, petrolastic cement has been applied to some old wooden flumes on the station.

There has been little change in the market for Yakima Valley produce in the last week.

Carl A. Larson.

San Antonio

Temperatures during the two-week period ending April 2 were close to normal. The wind movement was slightly above normal, and there was no precipitation. Transpiration and evaporation were high; the ground cracked badly where occupied by winter crops, and the plants are in distress. Germination and emersion of spring crops has been very spotted where seedbeds were loose. The last rain of agricultural significance occurred on March 2. The total precipitation for March was .61 inch below normal, and at the close of the month the need for a good, soaking rain was acute.

Summary of Climatological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							In.	Days	Days	Days
Mar.26	88	78.3	38	48.4	63.4	42	0	5	2	0
Apr. 2	87	77.1	40	47.3	62.2	39	0	4	1	2
Month of Mar.	89	69.5	22	42.5	56.0	41	1.30	13	9	9

The growth that alfalfa made prior to March 12 and which was killed by freezing on that date, together with the subsequent short growth, was clipped on March 23. The total yield of field-cured hay, which was of poor quality, from the approximately 8¼ acres was 2 tons. No rust has been found in the growth made since this last cutting.

Rotation plots of hay sorghums were planted on March 23 and 24. Disk harrowing, "Cyclone" harrowing, and general hoeing for weed control have absorbed the greater proportion of labor during the period.

Dr. D. C. Neal, Senior Pathologist, Division of Cotton, Rubber, and Other Tropical Plants, was at the station March 30 and 31 laying out experiments for testing the value of ammonia in various forms in the control of cotton rootrot. He was assisted by Messrs. K. C. Gunn and R. E. Wester, who had arrived from Greenville, Texas, on March 29.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending March 26 was 46° with a maximum of 57; the average minimum was 24, with a minimum of 18. The precipitation amounted to .4 inch, most of it being rain, followed by about 1½ inches of snow. This makes the total for the year .78 inch. The average hourly wind movement was 12.1 miles.

The work of cleaning corrals and fertilizing fields has been continued. The fields on the Walker tract have been covered and field C is about completed.

One car of potatoes was sold from the Walker tract and later a part of a car was filled out. The price of seed potatoes is advancing slightly, as there seems to be an early demand for seed stock throughout the valley. Dry land certified seed is selling for $1.25 per hundred and irrigated seed around 90¢.

The Great Western Sugar Company has offered contracts in the Colorado and Nebraska districts on the same basis as the other sugar companies, i.e., no guarantees, but the sliding scale will be the basis for the price next fall. The Holly Company has offered the same contract, and it is believed that the growers will accept. The Mountain States and Nebraska associations, however, have refused and will make a counter proposal. After April 1, if no contract has been accepted by the association, 65 per cent of the acreage will be automatically released. It is feared that under this arrangement a good many of the growers will be unable to obtain production loans. The financing by the Reconstruction Finance Corporation is inadequate to handle the beet crop; consequently, there will probably be an increased acreage of potatoes, corn, and barley in this section.

Prices of livestock have continued during the week at the higher levels. Eggs are now selling at 9¢ a dozen.

The average maximum temperature for the week ending April 2 was 63° with a maximum of 75; the average minimum was 30, with a minimum of 15. There was no precipitation. The average wind movement was 13.4 miles per hour.

It has been an unusually windy week, and not much farm work has been started. On the heavier soils some land has been prepared for small grains.

At the station all the plots in field K and the corn stubble land in field D have been disked and harrowed.

The beet growers in the Valley, through the Association, have demanded a minimum contract or a 50-50 division of all sugar and beet by-products; but the Sugar Company has given no indication of considering such a proposition.

The movement of lambs to market reached its peak this week when 105 cars were shipped out of this district as compared with 93 last year. The movement from the other sections in the West was above the average, and in all probability the market will break. However, the indications are that the recent strength in the lamb market will be continued for awhile.

Alfalfa hay is about all gone, and it has made a sharp increase in price, going from $8 to $10 a ton in the stack. With the exception of dairy products, there has been a slight increase in the price of all farm products.

James A. Holden.

Yuma

For the week ending March 26 the maximum temperature was 91, mean maximum 80.9; minimum 38, mean minimum 47.1; and the greatest daily range 47. There was no precipitation.

High winds on March 20 and 26 retarded the growth of cotton, which was planted the week before. However, there appears to be a good stand of cotton on most plots, but part of one plot had to be replanted on the 26th.

The lettuce growers have benefited from the steady increase in the price of lettuce. The first of the week prices reached $2.75 per crate for wire orders and $2.50 per crate for cash. During the week ending March 24 150 carlots were shipped, bringing the total to 755 cars for the season.

It has been reported that Yuma County's cantaloupe acreage this year totals 1,843—an increase of 1100 acres. The Salt River Valley acreage is 11,671 or 1,300 acres less than last year.

Messrs. C. S. Scofield and R. E. Blair visited the station on March 22.

Station work performed during the week has consisted of irrigating, cleaning up the brush and wood from the B orchard, trimming and pollinating date trees, fencing two alfalfa plots on the rotations, and hoeing sugar beets for large weeds.

The mean maximum temperature for the week ending April 2 was 88.5° with a maximum of 95 on April 1; the mean minimum was 47.9 with a minimum of 39 on March 31. The greatest daily range was 61. There was no precipitation.

The mean maximum temperature for March was 81.4, minimum 45.3, daily range 36.3. There was no rainfall during the month. The total precipitation since January 1 has been .94 inch, as compared with the normal for that period of 1.21 inches.

The mean stage of the Colorado River was 20.1 feet; highest, 20.9 feet; lowest, 19.2 feet. The discharge at Yuma was 774,300 acre-feet. The 30-year average for March is 913,800 acre-feet, maximum 3,107,400, and the minimum 276,400 acre-feet. These figures are reported by James H. Gordon, U. S. Weather Bureau meteorologist at Yuma, Arizona.

Applications to the U. S. Department of Agriculture for crop loans are being made in the Valley, but so far they have been slow in coming in. As explained by Homer Smith, loan inspector for Yuma County, the maximum loan is $400, including $1.00 per acre for seed, $1.00 for fuel, $1.00 for miscellaneous expenses, and $3.00 for water. The department stipulates that the applicant cannot get a loan for more acreage than he farmed last year, and in the case of cotton not more than 65 per cent of last year's acreage.

Messrs. G. J. Harrison and T. H. Kearney were station visitors from March 29 to April 1. During this period, they, with Mr. E. G. Noble and R. E. Beckett, made a trip to southern Arizona and northern Mexico in search of *Ammobroma Sonorae*, a rare parasitic food plant of the Southwest.

Station work has consisted of harvesting the first crop of alfalfa hay, replanting cotton in the rotations where it failed to come up, and pollinating dates.

Max E. Crannell.

W E E K L Y R E P O R T S

Of the Division Of
WESTERN IRRIGATION AGRICULTURE

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Newlands

The average maximum temperature for the six-week period ending April 9 was 61.3, with a maximum of 78 on April 1; the average minimum was 28.5, with a minimum of 15 on March 4. The mean temperature was 44.9. The average hourly wind movement was 3.71 miles. There was .11 of an inch of precipitation.

The general agricultural conditions on the project have undergone a little change in the last few weeks. The shortage of hay has caused the price to advance to $12 a ton in the stack. On the other hand, the price of butterfat has dropped to 18 cents a pound, which is the lowest price paid for it since dairying became an important enterprise in this section. The low price of butterfat and the high price of hay are having a very adverse effect on the dairy farmer's income. The expectation of a large crop of alfalfa and cheaper hay will help the dairying and livestock men but not the hay farmer. As grain is cheaper than usual, more of it has been fed in an endeavor to save hay. Eggs remain at 15 cents a dozen, spring lambs are bringing 5 cents, and beef 5 cents.

At the station the new area on which a great deal of work has been done during the winter and early spring months is about ready for seeding. This area was irrigated on the 7th of April. The final dressing of the various plots will be given following this irrigation. As soon as this is done those plots receiving manure will be treated and the entire area will be seeded. It is hoped that all this will be accomplished before May 1. The entire cropped area of the station was irrigated April 7 and 8.

The following seeding has been done during this period:

Plot	Crop	Date
D-3	Sweet clover	March 7
-6	" "	" 7
-2	Barley	" 7
-4	"	" 7
E-4	"	" 7
Y-19	"	" 15
-20	"	" 15
-21	"	" 15
-22	"	" 15
-23	"	" 15
B-19	Wheat	" 16
-20	"	" 16
-21	"	" 16
-22	"	" 16
J-1	" (Arizona No. 24)	" 17
-2	" (Little Club)	" 17

Newlands (cont'd)

Plot	Crop	Date
J-3	Wheat (Spring Federation)	March 17
-4	" (Early Baart)	" 17
C-6	Barley	" 18
-7	"	" 18
-8	Oats	", 18
-9	"	" 18
-10	"	" 18
-11	"	" 18
-12	"	" 18
-13	"	" 18

On March 26 the following 34 different grasses and clovers were seeded in demonstration plots: White Dutch clover, Chewing Fescue grass, Red Fescue grass, meadow Fescue, Astoria Creeping Bent grass, English rye grass, oat grass, orchard grass, Reed Canary grass, tall Fescue grass, Canadian blue grass, brome grass, Kentucky blue grass, Agrostis grass, Westerwold rye grass, Crested dog-tail grass, red top grass, Ladino clover, Alsike clover, red clover, Western wheat grass, Alkali grass, Strawberry clover, and Lespedeza Sericea.

During the last month or two the orchard has received considerable attention as to new plantings, spraying, and irrigating. The removal of several of the badly blighted and practically dead trees early in February left many vacancies. To fill out the rows, 93 trees shipped from Chico, California, and 30 additional trees received from nurseries were set out the first week in March. Orchard A-2 is entirely filled now, but A-1 has several vacancies which it is expected will be filled next spring. The new trees consist of apricots, plums, peaches, pears, apples, nectarines, and prunes. The nectarines are new for this region, but it is thought they may do well. The first spray of the season—a dormant oil emulsion, applied at the rate of 4 gallons to 100 gallons of water—was administered to all trees on the station area on February 26 and 27. So far this season the orchards have been irrigated twice, on March 8 and April 8. During the last few years the orchard has received very few irrigations, and many of the young trees have died. The drought conditions of 1929 and 1931 greatly influenced the number of irrigations. This year, however, sufficient water is available.

The cows remaining in the dairy herd appear to be free from breeding troubles. The storm of shy breeders seems to have spent its force, and the experiment should now proceed without much difficulty from this source. Most of the culling was done during the period of depression in the dairy industry. A large percentage of the original herd has been sold to the butcher during the past two years, and young individuals raised at the station have replaced them. It has been a slow process, but in this way there was no danger of introducing any other disease that might cause trouble.

The laboratory work has consisted of chemical analyses of both waters and soils and a few seed germination tests. The arrival of a new Roulette Comparator will enable the entire water analyses procedure to be standardized with that of the Rubidoux Laboratory. The analyses of waters from both the station area and the project are becoming exceedingly interesting and important, especially from the

Newlands (cont'd)

standpoint of boron. During the past year about 59 parts per million was the highest amount of boron recovered from a well water.

E. W. Knight.

Prosser

The maximum temperature for the week ending April 9 was 71°, the minimum was 29, and the greatest daily range was 33°. Some orchardists in the vicinity of Prosser have used orchard heaters.

At the present time the supply of irrigation water appears to be ample for the season. The reservoirs are approximately half full, holding 361,375 acre-feet. The past week the reservoirs have been filling at the rate of 1200 acre-feet per day. The snow in Snoqualmie Pass amounts to 109 inches. The flow of water in the Yakima River at the Sunnyside Dam on April 4 was 6,120 c.f.s. On April 9 this amount decreased to 3,590 and the Sunnyside Canal was carrying 697 second-feet. The station has not yet received water, but it is expected in a few days.

Roofing cement has been applied to cracks in wooden flumes to determine its value as a repair material.

The asparagus harvest began in the Valley during the past week. One carload was shipped on April 7. Asparagus has been bringing 7 cents per pound to the grower.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending April 9 was 53°, with a maximum of 67; the average minimum was 31, with a minimum of 22. The average wind movement was 11 miles per hour. The total precipitation was .28 inch, making a total for the year of 1.06 inches. The total evaporation was 1.078 inches.

Water was turned into the Main Canal of the Pathfinder District the first of the week for the purpose of filling Lake Alice and Lake Minatare; but as there was not yet enough water in the river to get a sufficient flow, the gates were closed down after a few days. The run-off from the foothills should commence soon, which will give a good head. Reports from all sections of the Rocky Mountain area indicate that there will be a good supply of water this year. With the normal rainfall, moisture conditions should be very good.

Winter wheat has suffered badly and the abandonment will be large. It is estimated that this year's crop will be only about half as large as that of last year.

The Lamb Feeders' meeting at the station this week was one of the best ever held here. It was well attended by local feeders from all parts of the valley and also by a number of the larger feeders from Colorado.

At the station the hauling of manure was completed except for the plots in field K. The grain plots in rotations 9, 1, 64, 45, 48, 28, 3, and 7 were plowed. The planting of grain all over the project is starting this week, with a fair amount of moisture in the ground.

The livestock movement to market grows heavier. At the end of

Scotts Bluff (cont'd)

the week 102 cars of lambs and 21 cars of cattle were moving. The Association is making an effort to distribute the shipment throughout the week instead of having it all go at one time.

With the exception of butterfat, most of the changes in the price of commodities have been upward.

James A. Holden.

Umatilla

Under date of April 9, Mr. H. K. Dean reported as follows:

"General development work on the new station site is progressing as well as can be expected in view of the unfavorable weather conditions. Several very severe winds have interfered greatly with grading. In fact we have had an average of only one quiet day a week during the last month or two. At present a crew of about 20 men and 20 horses are employed.

"We have strawed and seeded approximately 13 acres of sweet clover for pasture and 10 acres of alfalfa. Next week another 10 acres will be ready to be seeded to alfalfa.

"The grounds around the buildings have been laid out and graded. At present the shrubbery is being planted and the lawn seeded.

"The first car of pipe was received this morning and laying will start Monday. The structure at the "A" line to hold the screens has been poured, but the floor section will not be started until plans of the pump requirements have been received from the Worthington Company. The valves, check valves, and transitions are on hand."

Yuma

The mean maximum temperature for the week ending April 9 was 89.1, with a maximum of 94 on April 9; the mean minimum was 45.7, with a minimum of 39 on April 7. The greatest daily range was 50. Clear weather prevailed throughout the week.

The first crop of alfalfa hay was hauled in during the week. A very good quality of hay was obtained as the weather was ideal for hay making. There was a rather wide variation in the yields of the various rotations, as would be expected from the different crop sequence and treatments.

The following table gives the results of the first cutting of the tenth year for the continuously cropped alfalfa plots in the rotation experiment.

Plot No.	Treatment	Yield, pounds per acre
C-I-3	12 tons of manure, alternate odd years	1,740
C-I-4	No treatment	320
C-I-5	300 pounds of superphosphate, alternate odd years	2,340

These plots were all plowed up and reseeded in 1931, and a good stand was obtained. The stand on the manure and phosphate-treated plots has been maintained, while the plot receiving no treatment had a very poor stand.

Yuma (cont'd)

The hauling of alfalfa hay and the replanting of cotton accounted for most of the station work during the week. The date trees on the station were examined for scale by Federal inspectors. This work is in cooperation with the U. S. Plant Quarantine and Control Administration and Arizona and California State officials.

Max E. Crannell.

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M I S C E L L A N E O U S

LAMB FEEDING EXPERIMENTS

Conducted at the Belle Fourche Field Station 1931-32

These experiments were conducted in cooperation with the South Dakota State College to obtain information on the feeding value of home-grown feeds, the by-products of the sugar beet industry, and to find out how these feeds together with those that may be shipped in can be combined to yield the most profitable returns.

Lamb feeding has developed into an important agricultural enterprise in the Belle Fourche area. Lamb feeding has for the most part passed from the large operators who bought all their feeds to farmers who are either owners or operators of land. In most farming areas there is usually a great deal of growth which will go to waste unless it is consumed by such livestock as sheep. Whatever gains lambs make from it are practically clear profit. To maintain and improve the fertility of the land it is necessary to market roughages and grains through livestock. In a beet-growing territory lamb feeding is most advantageous for this purpose, as it is conducted in the fall and winter when general farm work does not require so much attention and furnishes employment throughout the year.

Lambs used.- Range wether lambs, principally Rambouillet, were used in these trials. The lambs were smooth, of good type and quality, with an average weight of 60 pounds. They were weighed up after a 12-hour shrinkage as they came in from the range, and this weight was used as the initial weight at the beginning of the experiment. They were divided into six lots of 100 lambs each.

Description of feeds used.-

Lot 1 Shelled corn, alfalfa hay
Lot 2 Barley, alfalfa screenings, pressed pulp, alfalfa hay
Lot 3 Barley, pressed pulp, alfalfa hay
Lot 4 Oats, pressed pulp, alfalfa hay
Lot 5 Wheat, pressed pulp, alfalfa hay
Lot 6 Wheat, oats (equal parts by weight), pressed pulp, beet tops, alfalfa hay.

The barley (Trebi) was grown locally and had a test weight of 48 pounds per bushel. The corn was Nebraska grown and graded No. 3 yellow. The wheat was shipped in and its test weight was 56 pounds per bushel. The oats, also shipped in, had a test weight of 34 pounds per bushel. The alfalfa was first and second cuttings and would grade U. S. No. 1.

Lamb Feeding Experiments (cont'd)

Management.- The lambs were all ear-tagged at the beginning of the experiment, and individual weights were taken at 30-day intervals. The extreme variation in gain was from 4 pounds to 58 pounds. The number of lambs that made average gain, above average, and below average were about in the same proportion in each lot. The following table shows the average amount of feed consumed per day and also the amount of water used per day by 100 sheep in lots 1 and 3.

Lot No.	Grain per lamb lbs.	Pulp per lamb lbs.	Alfalfa per lamb lbs.	Water, gallons per 100 lambs
1	1.34	0.0	1.73	50
2	1.61	2.96	1.11	--
3	1.36	2.99	1.20	20
4	1.37	2.99	1.25	--
5	1.38	2.99	1.25	--
6	1.33	2.99	.63	--
Average	1.39	2.98	1.17	35

Grain and pulp were fed in grain feeding pens twice a day. The grain was distributed on top of the pulp in feed troughs. Alfalfa hay was fed through panels twice a day to all lots except lot 6, which was fed alfalfa hay in the morning and beet tops in the evening. While the grain and pulp were consumed, hay was placed in the feed panels, the aim being to get the lambs on full feed of grain and pulp as these feeds were comparatively cheap as compared with alfalfa hay. All lots had access to water at all times through automatic waterers, and salt was available in boxes in each pen. The grain was started at one-third pound per day and pulp at one-half pound per day. Both these feeds were gradually increased so that at the end of the first 30-day period the lambs were consuming 1.25 pounds of grain and 3 pounds of pulp each. During the next 30-day period the grain was increased to 1.50 pounds per day. No further increase in pulp was possible. During the next 60 days of the feeding period the grain was further increased to 1.75 pounds per day except to lots 5 and 6, fed wheat, which was held at 1.6 pounds. The last two weeks, lots 3 and 4 consumed 2 pounds of grain per day, and lots 5 and 6 1.70 pounds per day. In lot 1, fed corn alone and alfalfa hay, 1.7 pounds was the maximum consumed without going off feed. In lot 2, 25 per cent alfalfa screenings were mixed with the barley. This lot during the last 60 days of the feeding period consumed readily 2 pounds per day of this mixture in addition to the pressed pulp and alfalfa hay. The water consumption per day in lot 1, fed corn and alfalfa hay, was 50 gallons as compared to 20 gallons per day in lot 3, fed barley, pressed pulp, and alfalfa hay.

Death loss.- The average death loss for all the lots was 4 per cent. This varied from 1 per cent in lot 2 to 7 per cent in lot 6. The heaviest losses occurred in lots fed wheat, but from one year's trial the evidence is not sufficient to say that wheat was the cause of the losses.

Lamb Feeding Experiments (cont'd)

Table showing the average daily gain for each 30-day period of the test

Items	Average daily gain 32 days	Average daily gain 29 days	Average daily gain 31 days	Average daily gain 30 days	Average daily gain 122 days
	lb.	lb.	lb.	lb.	lb.
Lot 1- Corn, alfalfa hay	.120	.367	.348	.379	.301
Lot 2- Barley, alfalfa screenings, pulp, alfalfa hay	.200	.343	.277	.433	.313
Lot 3- Barley, pulp, alfalfa hay	.123	.358	.255	.402	.282
Lot 4- Oats, pulp, alfalfa hay	.161	.331	.278	.348	.279
Lot 5- Wheat, pulp, alfalfa hay	.150	.340	.285	.353	.280
Lot 6- Wheat, oats, pulp, beet tops, alfalfa hay	.248	.309	.287	.319	.292
Average	.167	.341	.288	.362	.291

This table shows that the best gains are produced towards the end of the feeding period. During this finishing period the gains are much more profitable when the final finish is put on than at any other time the lambs are on feed. To sell at the top of the market the lambs must be finished and of proper weight.. These are important factors in feeding lambs successfully.

On February 13, 14, and 15 the lambs were weighed up and the experiment terminated. They were appraised by an experienced sheep salesman from the Sioux City market as follows:

Lot 1-	$6.45	Lot 4-	$6.30
Lot 2-	6.45	Lot 5-	6.35
Lot 3-	6.30	Lot 6-	6.35

The lambs were sold at Sioux City on February 22 to the Cudahy Packing Company for $6.35 straight, which was the packer top for that day. They were butchered in individual lots, dressing weights and dressing percentages being obtained from each lot. The dressing percentage in lots 1 and 2 was 51.1 per cent; in lots 3 and 4, 49.4 per cent; and in lots 5 and 6, 50 per cent. In the grading of the carcasses there was no material difference between the 6 lots. The average was 38 per cent choice, 60 per cent good or medium, and 2 per cent common.

The following table shows the detailed results of the 1931-32 lamb-feeding test.

Lamb Feeding Experiments (cont'd)

Results of Lamb-Feeding Experiments, October 15, 1931 to February 14, 1932

Items	Shelled corn, alfalfa	Whole barley, alfalfa screenings, pressed pulp, alfalfa	Whole barley, pressed pulp, alfalfa	Whole oats, pressed pulp, alfalfa	Whole wheat, pressed pulp, alfalfa	Whole wheat & oats, beet tops, pressed pulp, alfalfa
Lot No.	1	2	3	4	5	6
Number of lambs in lot	100	100	100	100	100	100
Initial weight(av.) lbs.	59.28	60.55	60.16	61.35	62.59	60.14
Final weight (") "	96.03	98.70	94.56	95.33	96.80	95.76
Gain per lamb "	36.75	38.15	34.40	33.98	34.21	35.62
Feed required per 100 pounds gain:						
Corn lbs.	444	---	---	---	---	---
Barley "	---	387	484	---	---	---
Oats "	---	---	---	492	---	228
Wheat "	---	---	---	---	493	228
Alfalfa screenings "	---	128	---	---	---	---
Pressed pulp "	---	948	1,060	1,074	1,066	1,023
Alfalfa "	581	355	424	447	401	214
Feed cost per 100 lbs.gain	$6.67	$6.52	$7.29	$7.48	$7.26	$6.41*
Initial cost of lamb	2.37	2.42	2.41	2.45	2.50	2.41
Feed cost per lamb	2.45	2.49	2.51	2.54	2.48	2.28*
Interest	.08	.08	.08	.08	.08	.08
Death loss	.10	.10	.10	.10	.10	.10
Freight and marketing	.69	.69	.69	.69	.69	.69
Total cost per lamb	5.69	5.78	5.79	5.86	5.85	5.56
Final weight at feed lot lbs.	96.03	98.70	95.56	95.33	96.80	95.76
Shrinkage to Sioux City "	8.13	9.04	7.73	5.87	8.33	7.47
Selling weight "	87.90	89.66	87.83	89.46	88.47	88.29
Selling price(appraisal)	$6.45	$6.45	$6.30	$6.30	$6.35	$6.35
Receipts per lamb	5.67	5.78	5.53	5.64	5.62	5.61
Profit or loss per lamb	-.02	.00	-.26	-.22	-.23	.05
Dressing weight (av.) lbs.	45.0	47.0	43.0	44.0	45.0	44.0
Dressing weight (per cent)	51.1	51.1	49.4	49.4	50.0	50.0

*Beet tops from .9 ton of beet yield figured at 50¢ per ton yield. Feed costs on which the computations are based: Grains, 85¢ per cwt.; alfalfa screenings, $8.00 per ton; alfalfa hay, $10 per ton; and pressed pulp, $2.00 per ton. The original cost of the lambs was figured at 4¢ per pound.

The important part of this table is the feed requirement per 100 pounds of gain and the cost. If corn and alfalfa hay, fed lot 1, is considered a standard ration, the results are about as follows: Comparing lot 3, fed barley, pressed pulp, and alfalfa hay, with lot 1, fed corn and alfalfa hay, it required in lot 1 444 pounds of corn and 581 pounds of alfalfa hay to make 100 pounds of gain at a cost of $6.67 feed lot gain and $8.57 gain actually sold. In lot 3, fed barley, pressed pulp,

Lamb Feeding Experiments (cont'd)

and alfalfa, it required 484 pounds of barley, 1060 pounds of pressed pulp, and 424 pounds of alfalfa hay at a cost of $7.29 feed lot gain and $9.40 gain actually sold. Comparing the prices actually paid for the feed in these two lots, lot 1 paid 85¢ for corn and $9.67 for the alfalfa hay. Lot 3 paid 85¢ for the barley and $6.44 for the hay, or 70¢ for the barley and $10 for the alfalfa hay. Lot 4, fed oats, pressed pulp, and alfalfa hay, required 492 pounds of oats, 1074 pounds of pressed pulp, and 447 pounds of alfalfa hay for 100 pounds feed-lot gain at a cost of $7.48 or $9.05 actually sold. Lot 4 paid $7.05 per ton for alfalfa hay and 85¢ for the oats, or at the rate of $10 for the alfalfa hay and 72¢ per hundred pounds for the oats. In lot 5, fed wheat, pressed pulp, and alfalfa hay, it required 493 pounds of wheat, 1066 pounds of pressed pulp, and 401 pounds of alfalfa hay at a feed-lot cost of $7.26 or $9.59 actually sold. Lot 5 paid $6.61 for the alfalfa hay and 85¢ for the wheat, or at the rate of $10 a ton for the alfalfa hay and 71¢ per hundred for the wheat. In lot 6, fed wheat and oats (equal parts by weight), pressed pulp, beet tops (50¢ per ton yield), alfalfa hay, it required 228 pounds of wheat, 228 pounds of oats, 1023 pounds of pressed pulp, beet tops from approximately .9 ton beet yield, and 214 pounds of alfalfa hay for 100 pounds gain at a cost of $6.41 feed-lot gain and $8.11 actually sold. Lot 6 paid at the rate of $11.28 for alfalfa hay, 85¢ per hundred for wheat and oats, or at the rate of $10 a ton for the alfalfa hay and 88¢ a hundred for wheat and oats. Charging alfalfa hay at $10 a ton and oats and wheat at 85¢ a hundred, the beet tops were worth at the rate of 65¢ per ton yield of beets. Charging wheat at 71¢, as in lot 5, and oats at 72¢ per hundred, as in lot 4, and alfalfa at $10 per ton, the beet tops were worth at the rate of $1.36 per ton yield of beets. In lot 2, fed barley, alfalfa screenings, pressed pulp, and alfalfa, it required 387 pounds of barley, 128 pounds of screenings, 948 pounds of pressed pulp, and 355 pounds of alfalfa hay to produce 100 pounds feed-lot gain at a cost of $6.52 or $8.57 for gain actually sold. The feeds in this lot were paid for at the rate of $10 a ton for alfalfa hay, 85¢ a hundred for barley, and 40¢ a hundred for alfalfa screenings. Charging barley at 70¢ per hundredweight, as in lot 3, and alfalfa at $10 per ton, the alfalfa screenings were worth in this test 86¢ per hundred pounds. In a previous test where alfalfa screenings were used without pulp, their feed value was equal to one-half this amount. The fattening value of any kind of screenings is variable and indefinite because they do not run even in the proportion of grain and seeds they contain. The risk of noxious weeds that are likely to be present is another item that should be carefully considered. The indication so far is that they have a feed value ranging from 50 to 100 per cent of barley when mixed with other grains not to exceed 25 per cent of the mixture.

Summary.- Wheat, barley, and oats are about equal in feed value when fed in combination with pressed pulp, and range from 88 to 90 per cent as efficient as a corn and alfalfa ration. Adding pressed pulp to an oats and alfalfa ration increased the efficiency of the oats about 10 per cent. Adding pressed pulp to the barley and alfalfa showed no special increase in gains due to the pulp. Pressed beet pulp can be used to advantage in a lamb feeding ration to supplement part of the hay, both as to economical gains and finish. Beet tops added to a ration of wheat and oats improved the efficiency of these grains and produced cheaper gains.

Beyer Aune

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV April 16 and 23, 1932 No. 9

Belle Fourche

For the week ending April 23 the maximum temperature was 80 and the minimum 33. The precipitation was 1.62 inches.

The month of April to date has been very favorable for spring work. All the grains, alfalfa, and sweet clover have been planted in the irrigated rotations. Also the grain varieties have been planted. Fields I, G, and P have been duckfooted or double disked and leveled. All farm work is well advanced.

The rain Friday and Saturday was a great boon to the entire western part of the State. The reservoir now contains over 90,000 acre-feet of water, and since the rain the flow is at the rate of about 4,000 acre-feet a day. An ample supply of water for the coming irrigation season seems assured.

Over 7,000 acres of sugar beets have been signed up. Previous to the rain referred to in the preceding paragraph, people were rather skeptical about signing up on account of the probable shortage of water. Now that the water supply is assured, an acreage of at least 10,000 is anticipated.

Beyer Aune.

Huntley

The maximum temperature for the week ending April 16 was 80 and the minimum was 17. There was a trace of precipitation. There has been no rainfall of any consequence so far during April, and with several days of high winds the soil is becoming dry. Moisture is badly needed for the germination of spring-planted seeds and for winter wheat and range. Preparation is being made to have water in the irrigation canals by April 25.

The seeding of grains and sugar beets is well advanced on the project. It is reported that slightly more than 26,000 acres of beets have been contracted for by the local beet sugar company. This acreage will probably be slightly increased before the planting season is over. Even though no definite minimum price for beets has been set, it is felt that this crop is probably the best cash crop to grow under existing conditions.

Station work during the week included seeding of all grains in the dry-land rotation fields, the preparation of land for grains and beets in the irrigated rotations, and the repairing and cleaning of irrigation laterals.

Huntley (cont'd)

Weather conditions continued favorable for field work during the week ending April 23, and spring seeding is well advanced. The maximum temperature was 76 and the minimum was 26. The precipitation was .22 inch.

Water was turned into the canal on April 21, and preparation was being made for irrigating crops "up," but this will probably not now be necessary since heavy rains have fallen in most sections.

There is some indication that damage to crops might result from an invasion of cutworms, particularly in winter wheat fields on dry lands.

At the station the seeding of grains, alfalfa, and sugar beets was completed. Further work was done in repairing the irrigation system.

Dan Hansen.

Prosser

The maximum temperature for the week ending April 16 was 82°, the minimum was 33.5, and the greatest daily range was 41. The precipitation amounted to .06 inch.

The Sunnyside Canal has been filled almost to capacity and is carrying 970 cubic feet per second at the intake. The Yakima River was carrying 3,180 cubic feet per second on April 11. This amount had increased to 6,870 cubic feet per second on April 16, due to the warm weather and frequent rains in the mountains. The storage reservoirs are holding 399,906 acre-feet—an increase of about 20,000 acre-feet during the past week. Irrigation water was received at the station on April 12, and the first irrigation is being applied to alfalfa. Two fields have been prepared for corn and will be planted soon.

The top prices for hogs have decreased from $5.00 to $4.00 per hundred. Hogs sold at the station brought 3⅓ cents a pound. Butterfat has decreased to 14 cents a pound. On the local market, asparagus has been bringing 5 cents per pound to the growers.

The maximum and minimum temperatures for the week ending April 23 were 69.5 and 28, respectively. The greatest daily range was 35. The rainfall was .24 of an inch.

The station is receiving an abundance of water at this time because the amount of run-off water in the river is large.

Corn has been planted on fields C-3 and D-6. The moisture condition was such that corn could be planted without irrigation. Wheat fields and alfalfa plots have been irrigated. Field E-9 has been plowed preparatory to planting corn.

The price of U. S. No. 1 potatoes in sacks is now $9.00 to $10. The top price for No. 1 first cutting alfalfa hay is $9.50 per ton baled. Medium grade alfalfa can be purchased for $6.00 per ton in the stack.

The results of three conductivity determinations of water samples from the Sunnyside Canal and the Yakima River at Prosser are given in the following table.

Prosser (cont'd)

Date	Sunnyside Canal		Yakima R. (Prosser)		Approximate p.p.m.	
	Volume flow	$K \times 10^{-5}$	Volume flow	$K \times 10^{-5}$	Sunnyside Canal	Yakima River
	c.f.s.		c.f.s.			
April 4	545	12.57	6,210	14.66	87.7	102.6
" 9	697	12.23	3,590	17.6	85.7	123.1
" 16	970	11.9	6,870	14.66	83.3	102.6

Carl A. Larson.

San Antonio

Temperatures during the two weeks period ending April 16 were near normal except for the night of April 11 when a minimum of 34 occurred. Very little, if any, frost accompanied this unusually low temperature and no damage resulted. There has been no effective rainfall since March 2, a period of 43 days, and the majority of small grain plots on the station are burned beyond hope of possible recovery. Most of the flax varieties will make fair to good yields if it rains soon.

Cotton plots in the rotation fields, in the fallow-rootrot experiments in field C-5, and in the subsoil-rootrot experiments in field C-6 were planted April 14 to 16. With the exception of the non-manured, fall-plowed rotation plots there is little hope for germination until sufficient rain to wet the seed bed is received. Even on the most favored plots germination will likely be very spotted.

Summary of Climatological Data

Week ending	Temperature						Aspect of the sky (days)		
	Maximum		Minimum			G.			
	Absolute	Mean	Absolute	Mean	Mean	D. R.	Clear	Partly cloudy	Cloudy
April 9	85	82.9	46	55.9	69.4	35	2	3	2
" 16	91	80.7	34	50.6	65.6	41	4	1	2

Note: No precipitation was recorded.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending April 16 was 71°, with a maximum of 81; the average minimum was 34, with a minimum of 24. The average wind movement was 8.3 miles per hour. The evaporation was 1.483 inches. There was no rainfall.

The week has been very favorable for farm work. At the station all the grain plots in fields K and E have been prepared, and the oats plots have been seeded. The laying out of variety test plots in the garden has been started, and the onion test plots have been seeded. A considerable acreage of beets has been planted during the last week. All farm work is well ahead of the usual schedule in this section.

Scotts Bluff (cont'd)

Over 50,000 acres of beets have been signed up so far, as compared with a total of 54,000 last year. In all probability the acreage will be greater this year than last, notwithstanding the fact that there will be no guaranteed payment for the beets. The association in the Holly Sugar Company territory in eastern Wyoming has just refused to accept a similar contract.

The lambs that have been on test the past winter were shipped at the end of the week. They were in good condition and should sell well.

The prices of butterfat and eggs have again decreased and are now quoted at 14 cents and 7 cents, respectively.

The Pine Ridge Agency in South Dakota is desirous of obtaining some high producing cows from this section. The Dairy Herd Improvement Association is collecting the stock for this shipment.

Water has again been turned into the main canal and is going into the supplementary reservoirs. The Pathfinder contains about 150,000 acre-feet, and the inflow is about 5,000 second feet per day.

The average maximum temperature for the week ending April 23 was 70°, with a maximum of 83; the average minimum was 41, with a minimum of 33. The evaporation was 1.334 inches. The wind movement averaged 13.1 miles per hour. The precipitation was 1.87 inches, making a total for the growing season of 2.15 inches.

Notwithstanding the heavy winds during the week, work went steadily forward. All of the beet plots in fields K and E were prepared and planted. The wheat plots were seeded the first of the week. Plowing in fields A and D was commenced. The sweet clover pasture on the Walker tract was plowed with a tractor, and plowing was started in field C.

Two severe dust storms came from the southeast on Thursday and Friday. It commenced raining Saturday morning about daylight and continued steadily all day. There was little run-off from the fields; and as practically all the grain and most of the beets were planted, it will be of great benefit to the crops. The rain was general over the project.

About 56,000 acres of beets have been signed up, which is a little more than last year's acreage.

Fifteen additional quarter acre plots have been staked out in field C, running north and south along the east side.

James A. Holden.

Yuma

Summer temperatures prevailed during the week ending April 16. A maximum of 100 was recorded on April 11 and a minimum of 44 on April 10. For the week the mean maximum temperature was 97.4, mean minimum 49.3, and the greatest daily range 54.

The yield of the first cutting of alfalfa hay over the valley has been good. The ideal weather during the last three weeks has helped greatly in producing the excellent quality of hay. The prices received, however, have been far from satisfactory. Good quality baled alfalfa hay is only $5.00 to $6.00 a ton on board cars. The

Yuma (cont'd)

cost of baling is $2.50 to $3.00 a ton. This does not leave the farmer much profit for his work. Many farmers would like to store their hay in the hope of getting better prices later, but they are unable to do so because of financial difficulties.

The work at the station during the week has consisted of general irrigating, harvesting hay on the B series, fertilizing alfalfa, cleaning up the gardens, and cutting wild oats out of the vetch.

Max E. Crannell.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV April 30 and May 7, 1932 No. 10

Belle Fourche

During the week ending April 30 the maximum temperature was 58 and the minimum 22. The precipitation was .87 inch. The total precipitation for April was 3.16 inches as compared with a normal of 1.45 inches, and is the highest precipitation on record at this station except in 1927 when the total was 3.92 inches.

The severe frost on April 25 did some damage to small grains and alfalfa. Apples and small fruits were also damaged, but to what extent can not be determined at this time. The early planted sugar beets that had just emerged froze to the ground and must be replanted, but this acreage was very small.

No field work could be done during the week because the ground was too wet. The men were employed in repairing and building fences.

The flow of the Belle Fourche River is still sufficient to run the inlet canal to capacity, which is about 1,000 acre-feet per day.

Beyer Aune.

Huntley

During the week ending April 30 the rainfall amounted to 1.56 inches. The maximum temperature was 58 and the minimum 25. Rains were general over most sections and were of much benefit to spring-seeded crops and range. The total rainfall in April was 1.78 inches and in March 2.43 inches, which was 2.17 inches higher than the average for this period.

The seeding of sugar beets in the valley is about 55 per cent completed, and the excellent soil moisture conditions should insure good stands. The total area of beets on the Huntley project will exceed 5,000 acres. A few farmers on the project have applied for and are obtaining Government seed loans to finance the growing of beets, although in most cases farmers are able to finance themselves or to obtain loans locally.

The farm price of alfalfa hay remains at $8 to $9 per ton. Great Northern beans are $1.10 per hundredweight. Butterfat is 15¢ a pound and eggs are 8¢ to 12¢ a dozen.

Station work during the week included repairing fences, buildings, and irrigation systems.

Dan Hansen.

Prosser

Report for week ending April 30

Comparison of weather conditions for the month of April 1931 and 1932:

Year	Temperature				Wind	Precip-	Evap-	Aspect of the sky		
	Max-imum	Mean max.	Min-imum	Mean min.	veloc-ity	ita tion	ora-tion	Clear	Partly cloudy	Cloudy
					m.p.h.	Inch	In.	Days	Days	Days
1931	86	67.7	25	38.7	4.23	0.44	4.539	14	12	4
1932	82	67.0	27	39.2	3.94	.39	4.336	4	24	2

Irrigation of the plots in the apple orchard began April 28. Three additional plots have been added to the series used last year. These plots will be used as a duplicate of the plots receiving irrigations every 30 days. The run-off water is being collected at the foot of each plot in a flume and is measured over a 9-inch weir, using a water-stage recorder to register the height of water at the weir crest. Soil samples are being taken not more than 12 hours prior to irrigation and 24 hours after irrigation. The first foot is being sampled immediately after irrigation and again 24 hours after irrigation.

The construction work on the new canal at the Prosser Dam is progressing satisfactorily. The concrete lining for the side walls is being laid and the bridge over the canal adjoining the steel bridge is almost complete.

The amount of water held in the reservoirs of the Bureau of Reclamation has increased 15,000 acre-feet during the last week. The run-off water in the Yakima River increased more than 2,000 c.f.s. during the week. At the diversion dam in the Yakima River 1,242 c.f.s. are being diverted into the Sunnyside Canal.

Feeder hogs were sold at the station for 3 cents a pound. The demand for hogs is light and the prices have a tendency to be weak. The No. 1 grade of asparagus is bringing 5 cents a pound to the grower. Butterfat and eggs still remain at 14¢ a pound and 15¢ a dozen, respectively.

Farm work for the week ending May 7 consisted of irrigating the plots in the apple orchard and the wheat plots on field E-8. Field C-4 was planted to corn the latter part of the week.

The maximum temperature was 77°, the minimum 38.5, and the greatest daily range 37.5. The first part of the week there was .28 of an inch of rain.

There has been little change in the prices of farm produce the past week. Top prices for hogs are $3.50 a hundredweight. U. S. No. 1 potatoes, in the sack, range from $8.00 to $11 per ton.

Impounded storage water increased 24,220 acre-feet during the week.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending April 30 was 46°, with a maximum of 54; the average minimum was 30, with a minimum of 20. About 3 inches of snow resulted in a precipitation of .35 inch. This makes a total for the growing season (since April 1) of 2.5 inches, which is a little above the average. The wind movement for the

Scotts Bluff (cont'd)

week was 13.7 miles per hour. The evaporation amounted to only 0.522 inch.

The week was cold and windy. On the night of the 25th the temperature dropped to 20 and remained at a freezing temperature until the 27th. Some of the earlier fruit was in bloom and this was killed. Alfalfa had made some growth and it was frosted enough to retard its growth somewhat. The early-planted beets were just beginning to come through and some damage was done to them. The Sugar Company officials, however, estimate that only about 150 acres out of a total of about 56,000 acres will have to be replanted on account of this freeze. Small grain in the sandier sections was damaged some by the winds.

Potato sorting and hauling manure was continued throughout the week. The beet plots were harrowed as the rain and snow had formed a crust over the fields. Small grain is up with a good stand.

Only about 100 cars of lambs are left in the Nebraska district at this time. Only 19 cars of lambs, two of hogs, and two of cattle went to market during the week. The price of lambs and hogs has dropped during the week. At Omaha on Saturday the top prices for lambs was $6.10 and $3.80 for hogs. Butterfat is now selling for 16¢ a pound.

The Beet Growers' Association in the Holly district in Wyoming has at last released the growers and probably the usual acreage will be signed up.

The average maximum temperature for the week ending May 7 was 68°, with a maximum of 81; the average minimum was 44, with a minimum of 38. The wind movement averaged 8.3 miles per hour. The precipitation amounted to 1.13 inches, making a total of 3.63 inches for the season, which is a little above the normal. The total evaporation was 0.968 inch.

Farm work has been retarded by rains the past week. However, the work is well along over the entire project. About 90 per cent of the beets have been planted and the remaining 10 per cent will be in in another week. Land is being prepared for corn and most of that crop will be planted during the next week.

At the station the barley and oats variety test plots were seeded. The three beet plots in the new rotations in field C were manured, plowed, and planted. The potato plots in rotations 25 and 21 were manured, and these together with all other potato plots in K and E were plowed. Field A was prepared for seeding with alfalfa and barley. One of the fields on the Walker tract was seeded to alfalfa with a nurse crop. Practically all of the plowing has been completed on this place.

Beets are coming through nicely and the germination has been very uniform. The condition of the soil is excellent, and all crops are making good growth. The dairy herd has been turned on sweet clover pasture nearly two weeks earlier than usual.

The water situation still looks promising. At the present time 435,000 acre-feet of water is in the Pathfinder reservoir and the inflow is at the rate of about 8,000 acre-feet per day. The present storage, all of which has accumulated during the winter season, is more than the total inflow all last season. As the greater part of

Scotts Bluff (cont'd)

the run-off from the mountains comes in May and June, the prospects seem good for a full reservoir.

Paul Stewart, Extension Agronomist of the Nebraska College of Agriculture, was in the Valley during the week and held several meetings with the bean growers. He spent one afternoon at the station conferring with the Superintendent.

Hog prices are the lowest they have been in 30 years. Broilers are coming on the market now, and the maximum price is about 18¢.

James A. Holden.

Yuma

The mean maximum temperature for the week ending April 23 was 84, with a maximum of 95 on April 17; the mean minimum was 47.6, with a minimum of 37 on the 22d. The greatest daily range was 49.

Cold winds from the north have been prevalent the past week. This kind of weather is fine for the ripening grain plots but is rather severe on the young cotton plants.

Alfalfa hay from the first cutting is still moving to the coast markets, although the price is still low. Good quality baled hay is selling f.o.b. cars or trucks at Yuma for $5.50 per ton. Butterfat prices as quoted from the creamery at Yuma were 17 cents a pound. Eggs are bringing 12 cents a dozen at the project stores. Very little alfalfa seed is being sold, and a large carry-over from the 1931 crop is still in the warehouses. Growers are offering seed as low as 5¢ a pound. Cotton is being planted on the project as the farmers make arrangements for production loans and water for irrigation. The finance companies who have assisted the cotton growers in the past have tightened up on their requirements and are making loans only to capable farmers who have fertile land. Water or construction payments are delinquent on approximately 10,000 acres on the Arizona side of the project and water has been shut off.

The Old Dominion Bank, the only bank that has been open and doing business on the project, closed its doors last week. This leaves the city of Yuma and its trading area without local banking facilities. Through good luck and some foresight the station mess club and employees did not lose any funds in the failure of this bank. The Yuma Valley Bank, which failed in June 1930, and the Security Trust & Savings Bank, which closed in September 1931, have not paid a cent in the process of liquidation.

The low prices offered for farm products and the added burden of bank failures have stimulated the demand for crop mortgage loans from the Farmers' Seed Loan Office. More than a hundred applications have been received at the Yuma office and twelve have been acted upon from the Bard section. The station is working with members of the county loan committee and is also cooperating with the Red Cross in distributing garden seed to about sixty families in this section.

Station work during the week included the thinning and cultivating of cotton, binding barley, pollinating dates, cleaning ditches, and general irrigating and hoeing. A distribution of 200 offshoots from seedling date palms on the station was made to the Yuma Indian School Farm. These shoots were removed from the roadway plantings along the east side of the field station and are to be planted along

Yuma (cont'd)

the west and north sides of the school farm. Only half of the shoots were removed from any palm.

E. G. Noble.

Report for week ending April 30

The mean temperature for April was about normal, the mean maximum being 83.3, the mean minimum 46.5, and the greatest daily range 54. There was considerable variation in the maximum temperatures of the month. Summer temperatures prevailed until the 20th when wind from the west brought unusually cool weather for this time of the year. The mean maximum temperature for the week ending April 16 was 97.4, while the mean maximum for the following week was only 84. There were two slight traces of rain during the month.

There was considerable wind during the last week of April, and the cool weather continued. The mean maximum temperature (82.1) was 1.9 lower than the week before. The mean minimum was 43.0 and the greatest daily range 48.

An experiment in growing sugar beets for seed was started at this station in the fall of 1930. The seed was planted in September, and the crop was to be harvested the following summer. One advantage of the mild winter of this section is that the labor of digging, storing, and resetting can be saved. However, if seed is to be produced, it appears that the beets must go into a dormant stage. Irrigation was withheld several weeks during the winter in an attempt to throw the beets into this stage. The results of the 1931 crop were somewhat discouraging as only 70 plants produced seed on a one-half acre plot. Seed was selected from the best stalks and was planted in another plot that fall. The rest of that plot and the original plot were planted to bulk seed from the north. This spring practically all of the selections have produced seed stalks, while only four seed stalks have appeared in the bulk planting so far this spring.

Station work during the week consisted of harvesting the early plots of small grain, chopping cotton, trimming and pollinating dates, and plowing the date plantings on the A series.

Max E. Crannell.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIV May 14 and 21, 1932 No. 11

Belle Fourche

During the week ending May 7 the maximum temperature was 72 and the minimum 29. The precipitation was .42 inch.

The sowing of oats and alfalfa in field P was completed during the week. About 75 Black Hills spruce, 2 to 3 feet tall, were obtained from the Forest Supervisor at Deadwood and planted along the driveway into the farm. Some were also planted in the irrigated forestry. Some 200 Bull pine were obtained and set out in the nursery. Extensive plantings of pine were made in the burnt-over area in the Hills this spring.

The maximum temperature for the week ending May 14 was 91 and the minimum 43. There was a trace of precipitation.

The planting of oats and sweet clover in field I was completed. This field was irrigated late in the fall and was so wet that planting could not be done at an earlier date. The grain plots in field A, which had been badly infested with wild oats, were double disked, duckfooted, harrowed, and planted during the week. The flax also was seeded. The planting of beets and corn in fields A, F, and G was completed.

Mr. Lyons was at the station on May 14 to plant the fertilizer beets. Eight different combinations of fertilizer was used, replicated four times, and planted in field G.

The sheep were turned out in the different pastures on May 14, and hogs were turned out in rotations 65 and 69 on May 13.

During the week ending May 21 the maximum temperature was 89 and the minimum 31. The precipitation was .41 inch.

Some 22 varieties of corn and five varieties of silage, replicated three times, were planted in field O on May 17. Eight varieties of flax and one of safflower were planted in field G on May 18.

The plots in field A were all marked out, and ditches for irrigation were made during the week. Water was turned into the North canal on May 16 and had reached Newell on May 20. The irrigation of alfalfa will begin the first of next week unless it should rain before then. All crops are in good condition.

Beyer Aune.

Huntley

The maximum temperature during the two-week period ending May 14 was 87 and the minimum 39. The precipitation was 1.26 inches. The rainfall of 1.26 inches during the first week in May following the heavy rains of the latter part of April raised the total during a period of

Huntley (cont'd)

three weeks to 3.04 inches. The total precipitation this year to May 14 was 6.84 inches, which is slightly more than occurred during the entire year of 1931.

Crop conditions are good on both irrigated and dry lands. Satisfactory progress was made during the past week in preparing land and seeding beets and late grains. Stands of beets from early seedings are fairly good and thinning will soon be under way. The acreage cropped to beans on the project will probably be much less than in previous seasons. An increased acreage is being seeded to alfalfa and feed grain crops.

Station work during the period included preparing land for seeding late grains and potatoes and cleaning up orchard and park plantings.

Mr. J. M. Stephens, of the Division of Dry-Land Agriculture, visited the station on May 9.

During the week ending May 21 the maximum temperature was 83 and the minimum 32. The precipitation was .16 inch.

Crop conditions continued favorable during this period. The irrigation of alfalfa and pastures was begun. This is the first irrigation of the season. The thinning of sugar beets is well under way on most parts of the project.

Several species of trees on the station grounds and in the park adjacent to the station have apparently sustained rather severe winter injury. This no doubt resulted from unusually low temperatures during early March following a thaw in February when the sap flow was started and buds formed on the trees. Trees showing greatest injury are Chinese elm, green ash, Boxelder, and plum. The more susceptible shrubbery such as the Spireas were either killed back entirely or partially frozen down. Spruce and pine also show evidence of injury.

Station work during the week included seeding of oats, potatoes, and corn in the irrigated rotations and irrigation of alfalfa and pastures.

Dan Hansen.

Newlands

The average maximum temperature for the five-week period ending May 14 was 66.7, with a maximum of 84 on May 11 and 12; the average minimum was 38.2, with a minimum of 28 on April 15 and 20. The mean temperature was 52.4. The average hourly wind movement was 4.2 miles. The precipitation amounted to 2.31 inches. The 1.80 inches of rain in April was the heaviest rainfall reported in that month since 1915.

The agricultural conditions on the project have not improved much. Butterfat still brings about 20 cents a pound and eggs 17 cents a dozen. Dairymen who need hay are making a few purchases at $12 a ton in the stack. Naturally very little hay is being sold at this price.

During the past week several carloads of Government-owned cracked what has arrived and is being given out to needy farmers by the Red Cross. The maximum allotment to any individual has been 15 sacks. The Red Cross has also had available several hundred sacks of flour. Many of the local Indians who were in need of food obtained some of this flour.

Newlands (cont'd)

The cool weather of April has retarded the growth of alfalfa. As a result the first cutting will probably be a week or more later than usual. A large crop of alfalfa hay is expected this year, with rather low prices in the fall. However, as there is a plentiful supply of labor, the wages paid to harvest hands should be lower, thus making the cost of haying less than usual.

The farmed areas of the project are looking very well for the most part. There is an abundant supply of water for irrigation, which in normal years would be quite encouraging. It is expected that at the end of the present irrigation season about 100,000 acre-feet of water will be left in the reservoir.

At the station the usual spring work has been carried on. Ladino clover has been sown on plots B-2, 3, and 4, and the grass pasture on B-5 and 6 has been reseeded. A portion of this pasture died during the dry season of last year. The reclamation of the new area known as the K series is nearing completion. This work would have been completed early in the spring had there been sufficient funds to hire the necessary men. It should make an interesting experiment when completed. The area usually planted to ensilage corn and also some six acres on the Y series will be seeded to corn within the next few days. This will produce more corn than can be used as ensilage, but it is hoped that information may be obtained which will reveal the progress that is being made in the reclamation of the Y series. That portion of the corn that cannot be fed as ensilage will furnish fodder for the young dairy stock.

The dairy experiment continues to produce some rather interesting data. The individual feeding of cows has shown that many of them eat more hay and grain than their theoretical requirements. Any additional increase in ration did not result in an increase of milk or an increase in body weight. An attempt will be made to feed each cow her theoretical requirements to determine if milk flow and body requirements can be maintained by such a method of feeding.

During the past month work in the orchard has consisted principally of checking the trees for blossoming dates, inspecting for aphis and other injurious insects, and tagging all trees with metal labels. A heavy irrigation was given on May 11 and a thorough spraying two or three days later. At the time of inspection for insects very few trees were infested with any type of the minute pests; those found were green aphis and mealy plum louse. The red spider was found earlier in the year, but evidently the dormant oil spray given in February was effective. It has been customary to spray the orchard about three times every year whether the insects are in evidence or not, as prevention is the best policy. The calyx spray was used, and the apples and pears were treated with a lead arsenate mixture, and the plums, peaches, cherries, and all others were sprayed with a combination of Black Leaf 40 and oil emulsion.

Some progress is being made in drilling approximately 30 test wells on the K and Y series, and it is hoped the wells may be completed in time to sample them all next month. These wells are located on the north and south extremities of each check and placed on a levee so as to be clear of farming operations. They are to be encased to a depth of 12 to 14 feet, with 3½-inch galvanized iron casing, having perforations in all but the top length of casing. They are to be pumped dry

Scotts Bluff

The average maximum temperature for the week ending May 14 was 78° with a maximum of 88; the average minimum was 44, with a minimum of 37. The evaporation has amounted to a daily average of .193 inch. The hourly wind movement has been 6 miles. No precipitation was recorded.

The week has been very favorable for work of all kinds. Fields A and C were seeded to alfalfa. The sweet clover pasture on the Walker tract was planted to corn as a means of filling in some of the low places.

The plots to be pastured in fields K and E were fenced, and five pigs were put on alfalfa in rotation 65. The sows and pigs were taken to alfalfa pasture on the Walker tract. Seven sows have a total of 62 pigs. The dairy heifers and young stock were turned on sweet clover pasture during the week, about a week earlier than last year.

Quite a large acreage of early potatoes is being planted in the Valley, and it is probable that as a result of the low price of seed the acreage of late potatoes will be as large as it was last year, if not larger.

Water is still running into the reservoirs on the Government ditch, and Lake Minatare is more than two-thirds full. No water has yet been turned into the laterals. The other ditches in the Valley are running water now; and if the favorable rains do not continue, irrigation will soon commence.

Livestock prices continue their downward trend. At the end of the week the Omaha top for hogs was $3.15 and for fat lambs $6.10. Beef prices were the lowest in twenty years, the tops being $5.75. Butterfat dropped to 12¢ a pound. Eggs have gained a little, and broilers are selling at 18¢ a pound.

The average maximum temperature for the week ending May 21 was 77°, with a maximum of 90; the average minimum was 48, with a minimum of 31. The average wind movement was 9.1 miles per hour. The average daily evaporation was .174 inch. The precipitation amounted to .45 inch, making a total of 4.08 inches for the season, which is still a little above the normal.

During the week the corn plots in field K were planted. The alfalfa plots in rotations 40, 42, 60, 61, and 62 were seeded, and the fall-seeded plots in 44, 48, and 65 were reseeded. The sweet clover plots in rotations 33 and 41 in field E were fenced and ewes and lambs were put in.

Water has been turned into the laterals, and ditches are being cleaned preparatory to starting irrigation next week.

Through the cooperation of the county commissioners, the Great Western Sugar Company, and the railroads, a special train carrying about 350 Mexicans left the Valley during the period en route to Mexico. In addition to these, a good many families will leave by automobile. These were all families that had not been able to get labor contracts for this season, and with the unemployment conditions as they are it was deemed best to get them away.

At the end of the period the Pathfinder reservoir contained 610,860 acre-feet of water, and the net increase in storage is about 17,000 acre-feet per day. During the past three weeks the storage has increased 175,000 acre-feet. The peak of the inflow will come in June. At the present time there is more water in the Pathfinder

Scotts Bluff (cont'd)

than there was last year at the end of June when the maximum storage is reached.

The eastern part of the project was visited by a heavy rain that flooded the lowlands, washed out bridges, and did considerable damage in one town. The rain was followed by heavy winds for a day or two, and before the beet fields could be harrowed and the crust broken the wind had destroyed quite a large acreage in that section. Practically all of it has been replanted, as there is yet time for a good yield.

James A. Holden.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV May 28 and June 4, 1932 No. 12

Belle Fourche

For the week ending May 28 the maximum temperature was 90 and the minimum 31. The precipitation was 2.02 inches.

Very little field work could be done during the week because of rains. Seed potatoes were treated and cut the first part of the week. The dry and irrigated orchards were sprayed with lime-sulphur. The rest of the time was spent in replacing culverts, cleaning up irrigation ditches, trimming and cleaning up shrubs on the grounds, and hauling manure.

The shearing of the flock of sheep on the station was completed Saturday. The average weight per fleece was 8.1 pounds. As yet no wool has been sold in this territory. So far the best offer made here is 10 to 12 cents. The cooperative wool pool has been advancing 50 cents per head to some of the growers.

During the week ending June 4 the maximum temperature was 82 and the minimum 44. The precipitation was 2.98 inches. The total precipitation for the month of May was 5.77 inches, which is 2.97 inches above the average for that month. The total precipitation from January 1 to June 1 was 9.80 inches, which is 4.91 inches above the average for that period.

No irrigation has been necessary to date. The water in the Orman Dam amounts to 127,000 acre-feet and is being stored at the rate of over 500 acre-feet a day.

On May 30 there was a rain of 2.92 inches with considerable hail. Most of the rain fell in less than an hour and did considerable damage to all crops, particularly to alfalfa and sugar beets. The sugar beets were so badly damaged by washing and crusting over that they were replanted the last of the week. Potatoes were planted in field A during the week. Other work consisted of cleaning up the yards and shrubs on the grounds.

Beyer Aune.

Huntley

The maximum temperature during the week ending May 28 was 85 and the minimum 29. The precipitation was .25 inch. The weather during the week was unseasonably cool and frost occurred on two dates. The more tender garden crops and early-seeded field beans were slightly damaged, although most of the beans were not yet up.

There has been no rain of consequence for nearly a month, and late-seeded crops are being irrigated "up." Sugar beet thinning is well under way in all sections of the valley and the crop, generally, is starting off well.

Huntley (cont'd)

At the station the seeding of oats, corn, and potatoes was completed. Other work included repairing irrigation ditches and irrigating alfalfa.

During the week ending June 4 the maximum temperature was 80 and the minimum 38. The precipitation was .15 inch.

The total rainfall during May was 1.91 inches, which is .23 inch below normal. This rain occurred during the first week in May; but dry weather has prevailed since that time so that irrigation of late-seeded crops has been necessary to provide moisture for germination of seed. Local dry-land crops are showing the effect of drouth. Winter wheat is beginning to burn. This, however, appears to be only a local condition, and dry-land crops in most sections of the State are doing well.

Station work during the week included irrigation of alfalfa and grains, cleaning and repairing irrigation ditches, and cultivation of beets. The thinning of beets was completed, and good stands were obtained in all cases.

Dan Hansen.

Prosser

The maximum temperature for the week ending May 28 was 73.5, the minimum 34, and the greatest daily range was also 34°. There was .01 of an inch of rain the first of the week.

Soil samples were taken from the corn and orchard plots.

The maximum temperature for the week ending June 4 was 79.5, the minimum 40.5, and the greatest daily range 36°. The first of the week there was .13 of an inch of rain.

Comparison of Meteorological Conditions for the Month of May

Year	Temperature				Wind velocity, m.p.h.	Precipitation	Evaporation	Aspect of the sky		
	Maximum	Mean max.	Minimum	Mean min.				Clear	Partly cloudy	Cloudy
						Inch	In.	Days	Days	Days
1931	95.5	80.4	31.5	46.1	3.48	0.01	8.164	19	11	1
1932	85.5	72.4	33.0	42.9	3.04	.62	6.155	12	11	8

During the week soil samples were taken and the orchard plots were irrigated.

The price of prime steers dropped from $5.75 to $5.25, and spring lamb prices dropped from $4.25 to $4.00. Wheat prices declined to 41 cents per bushel on futures. Strawberries are selling at wholesale for $1.10 to $1.15 per crate, and the price has been steady.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending May 28 was 66°, with a maximum of 89; the average minimum was 42, with a minimum of 40. The average daily evaporation was 0.155 inch. The average hourly wind movement was 10 miles. The precipitation amounted to .43 inch, making a total for the season of 4.51 inches.

Scotts Bluff (cont'd)

Water was turned on the first of the week. The alfalfa in field H and on the Walker tract, the sweet clover pasture in field C, and the blue grass and native grass pastures have all been irrigated. The first planting of beets in the time-of-planting test was thinned, and thinning of beets in the rotation plots in field K was begun. The latter half of the week was rainy, which delayed the work.

Thinning of beets over the project is well under way; and as conditions of growth have been very auspicious, a good stand of beets is in prospect.

At the end of the period the Pathfinder contained 722,000 acre-feet of water—a gain of about 112,000 acre-feet during the week. The Guernsey Reservoir is practically full, as are also Lakes Alice and Minatare. The Interstate Canal is diverting 1700 second feet and the Fort Laramie 910 second feet. The other canals in the valley are carrying close to capacity heads.

P. H. Stewart, Agronomist of the State Extension Service, has been in the valley inaugurating bean variety tests and holding demonstrations. The acreage in beans will be considerably increased this year.

There have been few changes in the prices of farm products. Practically all of the lambs have been shipped. Twenty-two cars of livestock, 16 of them cattle, went out the last of the week. The price of lambs increased slightly during the week. On the local market eggs have advanced about 2 cents a dozen and butterfat has dropped to 11 cents a pound.

The average maximum temperature for the week ending June 4 was 76°, with a maximum of 82; the average minimum was 47, with a minimum of 40. The average wind movement was 8.1 miles per hour. The average daily evaporation was 0.169 inch. The precipitation amounted to 0.24 inch, making a total of 4.75 inches for the growing season.

The average temperature for the month of May was 58° as compared with 55½° last year. The precipitation for the month was 2.25 inches as compared with 1.89 inches last year and a 20-year average of 2.83 inches.

The cool, damp weather has been favorable for the ravages of cutworms, and it is reported that a considerable acreage of beets had to be replanted on that account. Rotations 13, 15, 19, 43, and 47 in field E, in which beets followed sweet clover, have been rather badly damaged, and the plot in 47 had to be replanted.

There is an active demand for seed potatoes, and the acreage will be about the same as last year. The price of seed varies from 30 cents per hundred to $1.25, the latter being for high grade, certified potatoes.

Mr. W. W. McLaughlin, of the Bureau of Agricultural Engineering, Berkeley, California, visited the project during the week and inspected the work being done on the station by his office.

The storage in the Pathfinder has reached 750,000 acre-feet. The outflow is rather heavy now and the rate of increase has slowed up.

Heavy rains, resulting in rather serious floods, have occurred in the lower Platte River section and for a time have relieved conditions that were causing considerable uneasiness among the farmers along the river. It was reported that they were practically without water for irrigation when the rains came.

James A. Holden.

Yuma

The maximum temperature for the two-week period ending May 28 was 103, minimum 50, and the greatest daily range 49. The mean maximum temperature for the month of May was 93.4, mean minimum 54.6, mean 74. Two days were cloudy and 29 were clear. No precipitation was recorded during the month.

The maximum and minimum temperatures for the last ten days of May were lower than those prevailing from May 12 to 20. The mean temperature for the month was two degrees lower than for May 1931.

The third cutting of alfalfa is being harvested on the project. Many growers who usually make seed from the cuttings after the first or second hay crop are making hay from all cuttings this year. Hay prices are still low, but seed prices and prospects are relatively lower.

The present cool weather is holding back the vegetative growth of cotton, but the plants are in a very good fruiting condition. All thinning has been completed and some fields are being irrigated for the first time.

The flood stage of the Colorado River showed a discharge reading at Yuma of 75,000 second feet on May 28. Up-river reports indicate that approximately 100,000 second-feet stages will reach here in about ten days. The condition of the river protection works on this project is reported to be very satisfactory.

Station work performed during the two-week period included the plowing of barley stubble plots for grain sorghum plantings, cultivating and hoeing cotton, harvesting alfalfa hay, cleaning ditches, general hoeing and cultivating.

Mr. C. S. Scofield, accompanied by Dr. L. D. Batchelor of the Citrus Experiment Station, Riverside, California, visited the station and project on May 11 and 12. . . . Mr. Max Crannell was called east on May 25 to attend the funeral of his father in Ottawa, Kansas.

E. G. Noble.

M I S C E L L A N E O U S

SALT BALANCE CONDITIONS ON THE EL PASO PROJECT

Mr. L. R. Fiock
Bureau of Reclamation
El Paso, Texas

Dear Mr. Fiock:

By your letter of May 12 I have the data of discharge of the Rio Grande at five points from Elephant Butte to Ft. Quitman for 1931 by months. From these data and the analytical results reported by Breazeale on water samples collected under your direction at these five points throughout the year, I have computed the tonnage of salts carried by the river past these stations.

These results for the calendar year 1931 are summarized in the following table.

Salt Balance Conditions on the El Paso Project (cont'd)

Table 11/32. The discharge and salt burden of the Rio Grande in the vicinity of El Paso, Texas, for the calendar year 1931. Discharge data and water samples from Fiock; analyses by Breazeale.

Station	Water, acre-feet	Number of analyses	Salt content, tons per acre-feet	Total salts, tons
Below Elephant Butte	751,000	9	.83	623,330
Leasburg, N.M.	738,000	50	.87	642,790
El Paso, Texas	518,000	52	1.30	671,350
Fabens, Texas	280,000	65	2.04	571,950
Ft. Quitman	212,000	50	3.00	635,530

This table shows that while the successive diversions for irrigation diminish the discharge of the stream from 751,000 acre-feet at Elephant Butte to 212,000 acre-feet at Ft. Quitman, the salinity of the water is progressively increased so that the salt burden is substantially the same at the lowest station as at the upper. The slightly lower salt burden reported for the Fabens station is probably due to the fact that some water passes that station in channels that are not included in the gaging measurements.

In Table 6/32 I have summarized what data we have with respect to the discharge, salt burden, and quality of the water at the station below Elephant Butte Reservoir. A matter of special interest in this table is the showing of an abrupt change in quality of the water issuing from the reservoir on September 22 and 23. The discharge for these days was excessively muddy, in marked contrast to the conditions throughout the rest of the year when the water was clear or at most slightly turbid. The salinity also was well above the normal, the increase being chiefly in the sulphates of sodium and magnesium.

This discharge of muddy water occurred approximately ten days after a torrential rain-storm in the basin above the reservoir had caused a flood of muddy water to enter the reservoir at San Marcial. The indications are that this incoming flood passed along the bed of the reservoir for a distance of more than 50 miles and emerged from the gates at the bottom of the dam.

In Table 5/32 is a summary of the data for the Leasburg station. It should be noted in connection with this and the subsequent tables that the figures in the column headed "Mean discharge, c.f.s." represent the mean of the discharges reported with the samples and not the actual mean for the month.

Tables 4/32, 3/32, and 2/32 give the summaries for the three stations below Leasburg and appear to require no further comment.

In order to compare conditions at the four stations, Leasburg to Ft. Quitman, I have prepared Table 13/32. This contains some of the same data as Table 11/32, but it includes also data to show the progressive change in the proportions of the salt constituents from station to station. From the analytical data I have computed the tonnage of each constituent passing each station for the year. The table shows that while the total tonnage of salt passing Leasburg is substantially the same as that passing Ft. Quitman, there are pronounced dif-

Salt Balance Conditions, etc. (cont'd)

ferences with respect to the several salt constituents. With the bicarbonate (HCO_3), for example, the tonnage declines rapidly from Leasburg to Ft. Quitman, while with the chlorides (Cl) the tonnage increases. Of the six constituents identified, only two, the chlorides and the alkali bases, increase progressively down-stream, which indicates that the quantity of sodium chloride passing away from the project at Ft. Quitman is much greater than the quantity brought into the project at Leasburg. As a further elaboration of the data in Table 13/32, I have prepared Table 13/32-a in which is shown the percentage of each salt constituent to the total of these constituents, and in the last column the percentage of total to the total salts as determined by weighing the residue from evaporation.

Very truly yours,
C. S. Scofield.

Rubidoux Laboratory,
Riverside, Calif.
May 23, 1932.

Table 6/32. The discharge, salt burden, and quality of water of the Rio Grande at Elephant Butte, New Mexico, for the year 1931. Samples by Fiock; analyses by Breazeale.

Date of sample 1931	Discharge c.f.s.	Disch. acre-feet month	$K \times 10^5$ at 25°C.	Total salts	Tons acre feet	Total salts tons month	Milligram equivalents						Per cent silt
							HCO_3	Cl	SO_4	Ca	Mg	AB	
Jan.	--	389	--	--	--	--	--	-	--	-	-	-	--
Feb.	--	17,600	--	--	--	--	--	-	--	-	-	-	--
Mar. 12	1,085	73,000	79	528	.72	--	2.4	1.2	4.5	3.9	1.1	3.1	clear
Apr. 9	1,900	93,900	88	568	.77	--	3.1	1.2	4.8	3.9	1.3	3.9	clear
May	--	99,900	--	--	--	--	--	-	--	-	-	-	--
June 5	2,162	---	77	564	.77	--	2.7	1.6	4.4	4.9	1.1	2.7	clear
June	--	124,000	--	--	--	--	--	--	--	-	-	-	--
June 30	2,142	---	82	628	.85	--	3.1	2.0	5.0	3.4	1.1	5.6	clear
July	--	128,000	--	--	--	--	--	-	--	-	-	-	--
Aug. 9	1,300	103,000	81	664	.90	--	3.5	2.0	4.9	3.7	1.2	5.5	clear
Sept.13	1,575	69,500	82	540	.73	--	3.9	.8	4.9	4.0	1.0	4.6	trace
Sept.22	644	---	142	1,168	1.59	--	3.9	2.8	10.6	6.7	2.5	8.1	2.98
Sept.23	699	---	126	912	1.24	--	2.7	3.0	8.7	5.1	1.7	7.6	5.21
Oct. 5	570	19,900	97	720	.98	--	3.6	1.6	6.5	4.5	1.2	6.0	turbid
Nov. 9	3	16,700	87	648	.88	--	3.2	1.6	5.5	6.0	2.3	2.0	--
Dec. 16	540	4,800	91	648	.88	--	2.8	1.6	5.5	3.8	1.3	4.8	turbid
Total and mean	--	751,000	---	---	.83*	623,330*	--	--	--	-	-	-	--

*Estimated from nine analyses, excluding those of September 22 and 23.

Salt Balance Conditions, etc. (cont'd)

Table 5/32. The discharge, salt burden, and quality of water of the Rio Grande at Leasburg, New Mexico, for the year 1931. Samples by Fiock; analyses by Breazeale.

Month	No. of samples	Mean discharge c.f.s.	Disch. acre-feet month	Mean $K \times 10^5$ at 25°C.	Mean total salts	Mean tons acre-feet	Total tons salts month	Mean milligram equivalents					
								HCO_3	Cl	SO_4	Ca	Mg	AB
Jan.	1	54	3,870	165	1,008	1.37	5,300	3.5	9.0	4.6	5.4	1.6	10.1
Feb.	3	383	17,000	88	605	.82	13,940	3.1	2.1	4.7	3.9	1.6	4.4
March	4	1,073	67,600	87	597	.81	54,760	3.2	1.7	4.9	4.4	1.6	3.8
April	4	1,528	93,800	88	648	.88	82,540	3.6	1.5	5.3	4.0	1.3	5.1
May	5	1,309	86,600	89	637	.87	75,340	3.3	2.4	4.6	4.2	1.2	4.9
June	4	1,831	112,000	85	606	.82	91,840	2.8	1.6	5.0	3.8	1.0	4.6
July	5	1,883	117,000	87	588	.80	93,600	2.9	1.6	4.9	3.8	1.1	4.5
Aug.	6	1,807	111,000	86	597	.81	89,910	3.4	1.7	4.5	4.0	1.2	4.4
Sept.	2	917	71,800	105	751	1.02	73,240	3.7	2.6	5.9	4.4	1.6	6.2
Oct.	6	360	27,000	131	855	1.16	31,320	4.0	3.2	5.5	5.7	2.6	4.4
Nov.	4	464	21,700	102	724	.98	21,270	3.6	2.8	5.2	4.1	1.5	6.0
Dec.	6	161	8,930	118	801	1.09	9,730	3.9	4.3	4.9	5.0	1.9	6.2
Total and mean		---	738,000	---	---	.87	642,790	--	-	-	--	--	--

Table 4/32. The discharge, salt burden, and quality of water of the Rio Grande at El Paso, Texas, for the year 1931. Samples by Fiock; analyses by Breazeale.

Month	No. of samples	Mean discharge c.f.s.	Disch. acre-feet month	Mean $K \times 10^5$ at 25°C.	Mean total salts	Mean tons acre-feet	Total tons salts month	Mean milligram equivalents					
								HCO_3	Cl	SO_4	Ca	Mg	AB
Jan.	5	148	9,100	211	1,476	2.01	18,290	5.3	10.9	8.1	5.2	3.0	16.1
Feb.	3	226	13,900	177	1,181	1.61	22,380	4.5	7.0	7.1	5.9	2.1	9.6
March	5	808	40,500	136	914	1.24	50,220	3.8	4.5	6.5	5.5	1.7	7.6
April	4	1,330	56,800	131	914	1.24	70,430	3.8	4.1	6.8	4.9	1.4	8.4
May	4	770	53,700	144	992	1.35	72,490	3.3	6.0	6.7	5.6	1.3	9.1
June	5	1,243	63,100	127	856	1.16	73,200	3.7	3.7	6.2	5.2	1.6	6.8
July	5	1,397	76,440	127	842	1.14	87,140	3.8	3.7	6.6	4.8	1.6	7.7
Aug.	5	1,858	88,640	122	829	1.13	100,160	3.7	3.8	5.9	5.2	1.4	6.8
Sept.	4	876	52,480	136	949	1.29	67,700	4.1	4.7	6.7	5.3	1.5	8.7
Oct.	4	531	26,740	164	1,194	1.62	43,320	5.1	5.3	7.3	5.2	1.7	10.8
Nov.	4	287	22,250	185	1,313	1.78	39,600	5.2	8.6	7.7	5.8	2.3	13.4
Dec.	4	217	14,130	200	1,375	1.87	26,420	5.0	8.5	8.3	6.3	3.0	12.5
Total and mean		---	518,000	---	---	1.30	671,350	--	--	-	--	--	--

Salt Balance Conditions, etc. (cont'd)

Table 3/32. The discharge, salt burden, and quality of water of the Rio Grande at Fabens, Texas, for the year 1931. Samples by Fiock; analyses by Breazeale.

Month	No. of samples	Mean discharge c.f.s.	Disch. acre-feet month	Mean $K \times 10^5$ at 25°C.	Mean total salts	Mean tons acre-feet	Total tons salts month	Mean milligram equivalents					
								HCO_3	Cl	SO_4	Ca	Mg	AB
Jan.	6	140	8,300	258	1,670	2.27	18,840	4.1	14.5	8.8	6.9	2.6	17.9
Feb.	3	238	11,600	213	1,376	1.87	21,690	4.3	10.5	7.5	6.2	2.3	13.8
March	6	291	18,400	226	1,425	1.94	35,700	4.8	11.1	7.7	6.9	2.6	14.1
April	5	670	32,100	185	1,252	1.70	54,740	4.5	9.0	7.1	6.4	1.9	12.3
May	6	412	23,100	244	1,619	2.20	50,820	4.7	13.3	8.9	7.6	2.6	16.7
June	5	413	23,700	255	1,641	2.23	52,850	5.1	13.4	8.4	7.9	2.6	16.4
July	6	369	32,500	216	1,444	1.96	63,700	4.5	11.7	8.2	6.7	2.5	15.2
Aug.	5	1,056	54,600	211	1,446	1.97	107,560	4.4	11.0	8.0	6.4	2.7	14.3
Sept.	5	517	30,100	212	1,441	1.96	59,000	4.2	10.6	8.1	6.7	2.5	13.7
Oct.	5	274	16,800	276	1,850	2.52	42,340	5.0	15.0	9.5	8.1	3.2	18.2
Nov.	6	323	17,200	232	1,517	2.06	35,430	4.6	11.4	8.4	7.4	3.1	13.9
Dec.	7	189	12,100	276	1,781	2.42	29,280	6.4	14.2	8.3	7.7	3.5	17.7
Total and mean		---	280,000	---	---	2.04	571,950	--	--	-	--	--	--

Table 2/32. The discharge, salt burden, and quality of water of the Rio Grande at Fort Quitman, Texas, for the year 1931. Samples by Fiock; analyses by Breazeale.

Month	No. of samples	Mean discharge c.f.s.	Disch. acre-feet month	Mean $K \times 10^5$ at 25°C.	Mean total salts	Mean tons acre-feet	Total tons salts month	Mean milligram equivalents					
								HCO_3	Cl	SO_4	Ca	Mg	AB
Jan.	4	156	9,410	345	2,265	3.08	28,980	5.2	21.6	10.3	8.5	4.1	24.5
Feb.	4	188	10,200	327	2,158	2.93	29,890	4.9	21.7	9.7	8.4	4.0	24.0
March	5	175	10,100	376	2,462	3.35	33,830	4.6	25.7	10.6	9.6	4.4	27.1
April	2	150	34,700	333	2,088	2.84	98,550	4.1	24.9	7.4	7.5	2.3	26.7
May	4	483	21,700	362	2,371	3.22	69,870	3.9	23.6	11.5	10.4	4.1	24.6
June	4	129	8,750	417	2,777	3.78	33,070	3.4	31.0	11.7	11.1	3.8	31.2
July	6	270	17,220	334	2,239	3.04	52,350	4.5	22.3	11.0	8.8	3.2	25.8
Aug.	4	540	36,600	342	2,277	3.10	113,460	4.1	23.5	10.8	8.8	2.8	26.8
Sept.	4	231	17,640	318	2,102	2.86	50,450	4.4	20.5	9.6	8.2	3.8	22.5
Oct.	5	256	14,300	324	2,200	2.99	42,760	4.4	22.0	10.1	8.7	4.9	22.9
Nov.	4	259	16,480	292	1,876	2.55	42,020	4.3	19.6	9.5	8.0	3.4	22.0
Dec.	4	245	14,550	324	2,037	2.77	40,300	4.1	18.8	10.0	8.8	3.4	20.7
Total and mean		---	212,000	---	---	3.00	635,530	--	--	--	--	--	--

Salt Balance Conditions, etc. (cont'd)

Table 13/32. The discharge, salt burden, and tonnage of each salt constituent at four stations on the Rio Grande near El Paso, Texas, for the year 1931.

Station	Discharge acre-feet	Total salts, tons	Constituents in tons						
			HCO_3	Cl	SO_4	Ca	Mg	AB	Total
Leasburg	738,000	642,790	100,504	70,552	240,618	82,718	16,121	111,142	621,655
El Paso	518,000	671,350	84,933	120,062	224,289	75,198	13,871	137,448	655,801
Fabens	280,000	571,950	53,907	158,354	149,223	53,033	12,095	127,731	554,343
Fort Quitman	212,000	635,530	37,356	234,084	137,882	50,272	11,993	165,647	637,234

Table 13/32-a. The percentage of each constituent to the total constituents identified, and of this total to the total salts as shown in Table 13/32.

Station	HCO_3	Cl	SO_4	Ca	Mg	AB	Total
Leasburg	16.1	11.4	38.7	13.3	2.6	17.9	96.7
El Paso	12.9	18.3	34.2	11.5	2.1	20.9	97.6
Fabens	9.7	28.5	26.9	9.6	2.1	23.0	96.9
Fort Quitman	5.9	36.7	21.6	7.9	1.9	26.0	100.2

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Mr. C. S. Scofield arrived in Washington on June 7 from California, where he spent the last five months.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV June 11 and 18, 1932 No. 13

Belle Fourche

The maximum temperature for the week ending June 11 was 87 and the minimum 48. The precipitation amounted to 1.50 inches.

All the beets were replanted on June 6. Due to rains during the latter part of the week very little field work could be done, and the men were employed in cleaning up yards and trees in the irrigated forestry and repairing fences and culverts.

The maximum temperature for the week ending June 18 was 86 and the minimum 45. The precipitation was .87 inch.

Haying was started on June 14 in fields A, M-P, and O. Due to the severe hailstorm on May 30 the first crop of alfalfa is very light. The variety beans and forage crops were planted during the week. The fertilizer beet experiments were also replanted. These plantings were very much delayed by frequent rains, which made it impossible to complete this work at an earlier date. During the week all the corn was cultivated, and the roads were cleaned up in fields B, C, F, and G.

On Saturday the Irrigation District Board visited the station in regard to holding the farm picnic this year. The Board was very much in favor of the picnic being continued as an annual event and agreed to sponsor it. Plans for the picnic are now being made, and the date has been set for July 18.

Beyer Aune.

Newlands

The average maximum temperature for the five-week period ending June 18 was 75.6, with a maximum of 88 on June 13; the average minimum was 45.5, with a minimum of 34 on May 23. The mean temperature was 60.6. The average hourly wind movement was 4.02 miles. There was .74 of an inch of precipitation.

The spring plantings on all the experimental plots have been finished. The temperatures have continued below normal, and as a result the alfalfa and corn plantings are not growing fast. Grain plantings are looking very well. Heavy yields of wheat and barley are indicated in the station plantings. Much of the newly leveled area of the station is showing as much growth as could be expected on this raw desert land, but in a year or two it will show improvement.

Two irrigations have been given during this period. The rather cool weather has made it unnecessary to irrigate more frequently. This condition has prevailed over the entire project and has resulted in a gain each day in the amount of water stored in Lahontan Reservoir, there being 209,000 acre-feet at present. This is some 65,000 acre-feet short of the maximum storage capacity. The present outlook for water both this year and next is excellent.

Newlands (cont'd)

Beef is selling for 4½ and 5 cents; veal, 3½ cents on foot; hogs, 4 cents; and lambs, 4½ cents. A low price for hay is indicated. It is expected that it will bring about $6.00 a ton in the stack, but at the present time there is no demand. The local price for eggs is 8 cents a dozen and for butterfat 18 cents a pound.

A recently completed bulletin of the Nevada Agricultural Experiment Station, dealing with cost accounting studies in Nevada, contains interesting data on the economic condition of some of the farms on the Newlands project. On those farms cooperating in these cost studies it was shown that during the year 1931 minus returns were obtained for farm labor in dairying and raising hogs and beef cattle. The only plus returns for labor were with chickens and turkeys. The final labor returns were figured after all costs of farming operations, such as interest on investment, depreciation, and other overhead expenses were deducted. The outlook for the year 1932 is not any more encouraging.

At the station during this period the corn has been cultivated, the first crop of hay has been cut, and some new ground has been late seeded. The orchard received a heavy irrigation on June 13, and all trees infested with insect pests, particularly aphis, were sprayed with nicotine sulphate and whale oil soap on June 17. The orchard is in fine condition. Several of the new plantings are slow in leafing out and a few appear to be dead. A number of the pear trees are showing evidence of being badly blighted; in fact on several species the blight has advanced to such a state that removal of the entire tree seems to be the only remedy. Because of the presence of several different species of aphis on the plum, peach, prune, cherry, and apple trees they were thoroughly sprayed. This year seems to be ideal for the spread of all insect pests in this locality and immediate control measures are being recommended.

A medium set of fruit is in evidence at present, with plums and certain varieties of apples having somewhat heavy sets. One of the S. P.I. trees, Amygdalus davidiana, known as a wild peach, has produced a medium set of fruit for the second time since the tree was planted in 1915. Two ornamental shrubs, Prunus triloba and Prunus tomentosa, also planted in 1915, have fruited, which seems to be unusual for this locality. A few of the apricot and apple trees have leaves that indicate a chlorotic condition, and steps are being taken to determine the cause. Many leaves seem to have the appearance of characteristic boron injury, but whether this is due to boron, a high salt content, or some physiological cause is not known as yet.

E. W. Knight.

Prosser

The maximum temperature for the week ending June 11 was 89.5, the minimum 35, and the greatest daily range 42°.

The irrigation of the orchard plots was finished and the corn was cultivated. Field E-7 has been seeded to alfalfa. The first cutting of alfalfa hay was made on the small basin plots, and the remaining plots on field E-5 will be cut next week. The wheat plots are growing rapidly and the heads have begun to fill. One of the wheat plots received 2 acre-inches of water the middle of April, and has been doing fairly well because of the cool weather.

Prosser (cont'd)

Markets: Choice steers, $5.25; choice hogs, $3.50; prime spring lambs, $3.75. The price of butterfat has declined to 12 cents a pound and wheat futures to 36 cents a bushel. The first carloads of Bing cherries are being shipped from Kennewick at the lower end of the Yakima Valley. The first shipments will bring about $1.50 a box to the growers.

The maximum temperature for the week ending June 18 was 95, the minimum 39, and the greatest daily range 43.

The first cutting of alfalfa hay has been stacked. Because of the favorable weather the hay cured well and is of good quality.

The first cutting of No. 1 alfalfa hay is selling for $7.00 to $8.00 a ton for future delivery. U. S. No. 1 potatoes are bringing $13 to $15 a ton. Wheat futures are now quoted at 35 cents a bushel. The price of butterfat has remained at 12 cents a pound.

Carl A. Larson.

San Antonio

Report for the three-week period ending June 4.

The first rain of more than very temporary value since the first of March occurred on May 15. Although the greater portion of the 1.57 inches received came in heavy showers, the land was mostly in a proper state of cultivation and not a great deal of run-off occurred. Flax and most of the small grains were either already ripe or were too badly burned by drought to benefit from this rain. Spring-planted crops were greatly benefited. Maximum temperatures for May ranged somewhat lower than usual, and minimum temperatures were above normal; as a result the mean was practically normal. Corn and sorghums made excellent growth and flowered under favorable conditions, assuring a good set of grain. The ground in fields of these crops was cracking and additional moisture was badly needed at the close of the period. Although cotton plantings present a very uneven appearance because of spotted emergence and early growth, they are making satisfactory progress. Boll weevils were noted in the field by the time the earliest cotton emerged, and a few scattered plants were found dying from rootrot by June 1.

Threshing of small grains and flax was begun June 2.

Summary of Meteorological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							In.	Days	Days	Days
May 21	90	85.3	56	60.1	72.7	29	1.57	4	3	0
" 28	93	91.1	64	66.6	78.9	28	.55	5	2	0
June 4	93	91.1	67	69.7	80.4	24	Tr.	1	4	2
Month of May	93	86.7	56	64.2	75.5	29	2.68	13	13	5

Official visitors at the station included Mr. D. R. Hooton, May 26 to 28; and Mr. R. F. Saunders, May 28--both of the Division of Cotton, Rubber, and Other Tropical Plants.

San Antonio (cont'd)

For the two-week period ending June 18 the maximum temperature recorded was 101, minimum 62, mean 84.9, and greatest daily range 34. The precipitation totaled 1.30 inches. There were nine days with a clear sky and five were partly cloudy.

A heavy shower of .83 inch occurred between 7:00 and 7:30 a.m. June 10, which furnished temporary relief to corn and sorghums (both hay and grain). Another local shower of .44 inch on June 12 served principally to give temporary relief from the heat. Wind movement and temperatures have been high during the last week, and at the close of the period the corn crop in most fields was deteriorating very rapidly. Sorghums were firing rapidly, but cotton was still making good growth. Cotton boll weevils are numerous, and rootrot is showing at least normal infection.

The threshing of all small grains and flax, except the two latest dates of planting and the Argentine selection nursery rows, was completed under ideal weather conditions. Yields of small grains were extremely variable, depending almost entirely on the stored moisture preceding planting and the "drouthiness" of the plot. On land plowed in summer or early fall and kept free of weeds until planting time the yields were fair to good, while on land which was cropped in 1931 to sorghum or cotton, or which was weedy, and plowed after September, there was practically no grain produced. Flax yields were very satisfactory, notwithstanding the fact that most varieties suffered severe freezing-back in March.

The yields of grain threshed from rotation plots, variety test plots, and field plantings, and of flaxseed from variety test plots and increase plots are given in the following tables.

Oats: Rotation and Tillage Experiments

Rotation	Grain yield		Straw	Rotation	Grain yield		Straw
	Per plot	Per acre	per acre		Per plot	Per acre	per acre
	Lbs.	Bus.	Tons		Lbs.	Bus.	Tons
A4-C	278	34.75	1.18	A5-D	(1)	0.0	1.86
-F	(1)	0.0	.62	-E	(1)	0.0	1.40
-G	(1)	0.0	.70	A6-F	(1)	0.0	1.66
A5-C	154(2)	19.25	.77	B5-8	(1)	0.0	.58

(1) Entire plots were so badly burned by drought that no grain was produced.

(2) Only the portion of this plot where all the preceding crop of cotton had died from cotton rootrot produced grain.

Increase Plantings of Flax - 1932

Location	Variety	Area of plot	Flaxseed		Test weight per bushel
			Per plot	Per acre	
		Acre	Lbs.	Bus.	Lbs.
A-3	Rosquin	0.564	Data not yet available		
B-4(N)	Rio	.2	98.5	8.8	56.0
B-4(S)	Rio	.2	103.0	9.2	56.0
B-4	C.I. 342	.145	78.0	9.6	54.5
B-4	C.I. 690-691	.189	79.5	7.5	54.5

San Antonio (cont'd)

Flax Variety Test - B-4 - 1932

Variety	Flaxseed per acre (bushels)				Test weight per bushel	Average straw yield per acre
	First plot	Second plot	Third plot	Average		
					Lbs.	Ton
N.D.R. 114	11.5 10.5	11.4 11.6 10.7	11.1 11.1 12.1	11.3	56.0	.70
Redwing	8.5	9.1	9.4	9.0	56.0	.53
Morteros	11.6	11.6	11.6	11.6	55.5	.67
Rosquin	11.2	10.5	10.3	10.7	56.0	.70
C.I.690-691	12.6	13.2	11.2	12.3	54.5	.57
Rio	11.7	11.5	10.3	11.2	56.0	.75
Bison	9.6	10.3	11.2	10.4	55.5	.75
Linota	10.6	11.4	11.1	11.0	56.0	.85

Small Grain Variety Test - Field C-3 - 1932

Variety	Grain per acre (bushels)				Straw yield per acre
	First plot	Second plot	Third plot	Average	
					Tons
Wheat:					
Kubanka	9.0 13.5	13.5 14.3	17.0 16.3	13.9	1.39
Ceres	11.3	11.8	13.3	12.1	.88
Marquillo	10.3	11.8	12.8	11.6	.85
Hope	5.0	9.8	5.5	6.8	.70
Reliance	6.0	11.3	10.8	9.4	.67
Mindum	13.8	15.0	16.5	15.1	1.23
Oats:					
Texas Red Rustproof	9.0	5.8 7.5	8.0 7.5	7.6	.65
Ferguson922	6.5	7.5	6.8	6.9	.70
Nortex	5.0	7.5 7.3	7.8	6.9	.81
Brunker	9.8	11.5	12.3	11.2	.76
Victoria	--	8.8	--	8.8	1.23
Barley:					
Texas Winter	16.5	14.5	16.5 18.5	16.5	.94
Vaughn	23.5	20.5	22.8	22.3	.68
Hannchen	12.3	13.5	16.5	14.1	.83
Trebi	3.0	2.3	4.3	3.2	.80

San Antonio (cont'd)

Official visitors were Mr. H. N. Vinall, of the Division of Forage Crops and Diseases, on June 12; and Messrs. E. R. Collins and W. V. Black, of the Division of Soil Fertility, Bureau of Chemistry and Soils, June 13 to 15.

Geo. T. Ratliffe

Scotts Bluff

The average maximum temperature for the week ending June 11 was 77°, with a maximum of 85; the average minimum was 46, with a minimum of 41. The average wind movement was 6.6 miles per hour. The average daily evaporation was 0.187 inch. The precipitation was 0.28 inch, making a total for the growing season of 5.03 inches as compared with 2.59 inches last year and a 20-year average of 5.80 inches.

During the first ten days of June the temperature has averaged about 5° cooler than for the same period last year. Notwithstanding this fact, crops have made good growth and are well ahead of last year. The first cutting of alfalfa will commence from a week to ten days earlier than last year. While the moisture has been only about normal, it has been well distributed. Most of the beets have been blocked and thinned, and the stand will probably be a little better than normal.

Irrigation has been continued throughout the week, and most of the alfalfa plots in field K have been watered. The new alfalfa in field A and on the Walker place is now being watered. A good stand was secured.

There has been little change in the prices of farm products, but little is left on the farms in this section, so that prices haven't much effect on conditions. Most of the farmers seem fairly optimistic: the prospects for a good crop this year is keeping them in good spirits.

The average maximum temperature for the week ending June 18 was 79°, with a maximum of 87; the average minimum was 50, with a minimum of 44. The precipitation amounted to 1.10 inches, making a total for the growing season of 6.13 inches, which is slightly below the average for this period. The average daily precipitation was 0.146 inch. The average wind movement was 7.2 miles per hour.

The first half of June was several degrees cooler than last year, but the crops have made splendid growth because of the well timed rains together with plenty of irrigation water. Grain has headed out nicely. A large part of the first crop of alfalfa over the project has been cut. Beets are coming up to a good stand, probably a little above normal.

During the week practically every section of the project has received a good rain, but in some places fields were badly washed. At the station water has been run continuously throughout the week, and the grain in fields E and A and the grain plots in field K have been irrigated. The bean plots in E and C were planted. The planting of potatoes in field K was begun on the 16th.

Mr. W. A. Hutchins, of the Bureau of Agricultural Engineering, visited the station during the week. He was making studies of the return flow of irrigation waters. A representative of the station took him over the North Side project.

The storage in the Pathfinder and Guernsey Reservoirs was 840,000 acre-feet as compared with 604,000 at the same time last year.

James A. Holden.

Yuma

Station work performed during the week ending June 18 consisted of making alfalfa hay, plowing for grain sorghum, cleaning ditches of weeds and silt, hoeing cotton for Bermuda grass, and general irrigation.

The people in this section are putting their electric fans into motion. The general opinion is that summer has arrived. The maximum temperatures are beginning to stay up near and above 100. The highest temperature so far this season has been 108, which came on June 12 and 13. There has been practically no air movement during the month. That is the usual condition during the summer except during a few storms.

The third crop of alfalfa hay was cut during the week ending June 11 and hauled in the following week. The quality was excellent. The yields of all plots in the rotations, with the exception of the young alfalfa planted last spring, were 1676, 1496, and 1828 pounds per acre for the three cuttings, respectively. This is probably not far from the average of the valley.

It is of interest to note that over 4,000 tons of alfalfa hay was shipped through Yuma by truck during the month of May. All of this hay was on its way to the Los Angeles market. Most of it came from the Yuma Valley and other alfalfa-producing regions of Arizona.

Summary of Climatological Data

Week ending	Temperature						Aspect of the Sky		
	Maximum		Minimum		Mean	G. D. R.	Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean					
							Days	Days	Days
June 4	91	87.6	49	51.1	69.3	42	6	1	0
" 11	106	97.9	51	54.7	76.3	49	7	0	0
" 18	108	101.6	54	57.1	79.4	50	5	2	0

Note: No precipitation was recorded.

Yuma (cont'd)

Barley Yields in the Irrigated Rotations
at the Yuma Field Station

Rotation No.	Yield, bushels per acre											Rank
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	Average	
8	64.8	30.8	16.5	23.0	11.9	9.5	8.5	13.3	10.8	9.2	19.8	12
9	49.2	25.4	21.6	30.8	10.5	12.4	7.8	10.8	8.3	12.8	18.9	15
11	22.8	26.0	22.2	16.3	20.0	12.3	15.7	19.2	18.8	20.6	19.4	14
12	18.9	15.0	2.9	6.3	7.8	3.5	3.8	2.9	4.4	2.2	6.7	17
24	15.0	4.6	7.1	8.2	5.7	5.9	4.9	2.7	3.4	7.1	6.5	18
26	--	--	--	--	--	46.1	43.1	19.2	11.3	17.4	27.4	4
28	--	--	--	--	--	49.8	30.4	8.9	8.4	13.9	22.3	9
30	9.7	10.4	2.8	6.4	4.3	6.7	2.9	4.6	7.9	5.3	6.0	19
31-1	--	--	--	--	--	30.1	15.8	17.5	12.1	9.6	21.0	11
31-2	--	--	--	--	--	47.3	11.6	13.7	10.2	14.6	19.5	13
32	--	--	--	--	--	62.7	46.7	50.0	36.2	38.3	46.8	1
42	46.5	23.2	14.3	17.9	16.4	17.2	11.2	29.3	11.6	26.5	21.4	10
46	45.3	25.3	31.0	43.3	30.3	19.7	24.8	31.6	28.7	34.3	31.4	2
50	28.7	17.4	31.5	22.7	19.7	18.3	22.6	28.8	21.1	21.8	23.3	8
54	--	--	--	--	--	39.8	30.3	14.5	9.3	24.2	23.6	6
56	--	--	--	--	--	43.2	45.2	16.3	13.3	34.2	30.4	3
60	24.6	19.0	17.9	26.1	21.2	18.0	24.4	21.1	28.8	34.3	23.5	7
63	27.3	12.5	6.1	20.6	10.8	9.3	16.1	9.5	12.8	14.0	13.9	16
65	--	--	--	--	--	37.3	46.0	19.0	12.8	7.5	24.5	5
Maximum	64.8	30.8	31.5	43.3	30.3	62.7	46.7	50.0	36.2	38.3	46.8	
Minimum	9.7	4.6	2.8	6.3	4.3	3.5	2.9	2.9	3.4	2.2	6.0	
Average	32.1	19.1	15.8	22.2	14.4	26.8	11.6	17.5	14.2	18.3	21.4	

Max E. Crannell.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV June 25 and July 2, 1932 No. 14

Belle Fourche

During the week ending June 25 the maximum temperature was 90 and the minimum 54. The precipitation was .01 inch.

The first cutting of alfalfa was completed on June 23. It was rather light due to the hailstorm on May 30. The irrigation of small grains and alfalfa was commenced on June 25.

The replanted sugar beets came up with a good stand and made excellent growth. The outbreak of web-worms was first noticed in field G on June 20. Two applications of spray have been used, but owing to the small size of the beets the worms are difficult to control. These worms are causing much trouble in different areas of the project. The Sugar Company has several sprayers that are being loaned to the farmers. No serious trouble with grasshoppers has been encountered in this locality.

Beyer Aune.

Huntley

The maximum temperature during the two-week period ending June 25 was 96 and the minimum 47. The precipitation was .95 inch.

Following the heavy rains in early June crops are in excellent condition. So far irrigation has been required only for early grains and alfalfa. The sugar beet crop is in good condition, thinning being completed by June 15.

At the station the first cutting of alfalfa was harvested during the week. Although this work was interrupted by occasional light showers, the hay is of good quality. Good yields of hay are reported from all sections of the valley. Range conditions are better than for several years, and dry-land crops in most sections of the State are good.

Bids on wool in the Huntley wool pool were requested. The best offer received was 6½ cents a pound, and the directors of the pool have decided to consign the wool to the Boston market in hope of obtaining a better price.

The price of butterfat is 11 cents and 13 cents a pound. Fat hogs are bringing 3 cents top on the local market.

Mr. Wm. Baird, of the Mandan (North Dakota) Field Station was a visitor on June 25.

Dan Hansen.

San Antonio

Strong, parching winds from the south and southeast prevailed during most of the two weeks ending July 2. The drouth was effectively broken by rains which started the evening of June 30 and continued through the close of the period. In the immediate vicinity of the sta-

San Antonio (cont'd)

tion the rains were of a torrential nature for brief periods of time, but very little soil washing resulted. North and west of San Antonio unusually heavy rains occurred, causing record-breaking rises in the Guadalupe, Frio, and Neuces Rivers and their tributaries. Many deaths are being reported, and the property damage will be enormous.

Corn on the station fired badly, but a very good yield was practically made before the drouth became effective. The rains will be of limited benefit to that crop. The principal grain sorghum varieties were mature at the end of June and will deteriorate as a result of this rainy weather. Hay crops, pastures, and orchards will benefit immensely.

Cotton boll weevils were present early in the season, but up to this time they have caused much less damage than usual. The plants are flowering heavily and many bolls are fully three-fourths grown.

Summary of Meteorological Data

Week ending	Temperature						Precipitation	Aspect of the Sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
June 25	100	94.4	71	73.4	83.9	28	.12	1	2	4
July 2	99	92.3	72	74.3	83.3	24	3.20	0	4	3
Month of June	101	94.2	62	71.2	82.7	34	2.03	10	13	7

Official visitors have included Messrs. H. V. Jordan and H. Nelson, of the Bureau of Chemistry and Soils, on June 24, and Dr. D. C. Neal, of the Division of Cotton, Rubber, and Other Tropical Plants, on June 28 and 29.

Geo. T. Ratliffe.

Prosser

The maximum temperature for the week ending June 25 was 96.5°, the minimum was 44, and the greatest daily range was 44.

During the week the corn has been hoed and thinned and seed potatoes prepared for planting on field E-6.

Summary of the Specific Conductivity of Water Samples from the Sunnyside Canal and the Yakima River, May 21 to June 18.

Date 1932	Sunnyside Canal		Yakima R. (Prosser)		Approximate p.p.m.	
	Volume flow	$K \times 10^{-5}$ at 25° C.	Volume flow	$K \times 10^{-5}$ at 25° C.	Sunnyside Canal	Yakima River
	c.f.s.		c.f.s.			
May 21	1300	11.30	6400	16.15	79.1	113
" 28	1300	11.30	5690	19.95	79.1	139.5
June 4	1248	9.69	3790	18.85	67.8	132
" 11	1238	9.69	4270	19.95	67.8	139.5
" 18	1273	8.70	5610	13.05	60.8	91.3

Markets: Wheat futures, 36 cents a bushel; choice hogs, 160 to 200 pounds, $4.25; choice hogs, 140 to 155 pounds, $3.75; U. S. No. 1 new potatoes, $20 to $22 per ton; old potatoes, $13 to $15 per ton.

Prosser (cont'd)

The water-users of the Sunnyside Irrigation District have entered into litigation with the Bureau of Reclamation because of two controversial questions. The first is whether the Bureau of Reclamation has the right to transfer rentals from supplemental water to the building of the Cle Elum Dam; and the second is whether the Bureau of Reclamation has the right to deliver water on supplemental contracts other than for beneficial use, which has been practiced in the past. At the present time a mandatory injunction has been issued against the Bureau of Reclamation by the Federal District Court of Spokane, forcing the Bureau to deliver water as it has been delivered in the past until the case comes to trial next fall.

The first part of the week ending July 2 was continuously hot, but during the latter part of the week the temperature declined. The maximum temperature was 96.5, the minimum 50, and the greatest daily range 44.5.

The reservoirs of the Bureau of Reclamation have been filling continually since winter and have now reached their capacity of 660,307 acre-feet. Last year on July 2 the total storage water held amounted to 489,219 acre-feet.

Farm work consisted of irrigating the orchard and taking soil samples. The volume of water flowing through the metal flume which supplies the orchard plots has been measured in order to check the accuracy of the meter.

Hog prices have been consistently increasing for the last few weeks. The price of choice 160 to 200-pound hogs is $4.50 per hundred.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending June 25 was 84°, with a maximum of 89; the average minimum was 59, with a minimum of 51. The precipitation amounted to .40 inch, making a total for the growing season of 6.53 inches, which is still a little below the average. The average daily evaporation amounted to .216 inch and the average wind movement was 5.4 miles per hour.

While the precipitation has been below normal, it has been so well distributed that the crops have received the maximum benefit from it. A rather odd feature of the rainfall is that since the rains began on April 6 there has been precipitation on eight of the twelve Saturdays and on two other week-ends the rain came either on Friday or on Sunday. Fifteen of the 21 rains came on Friday, Saturday, or Sunday. The longest dry period during the three months has been eight days. In consequence, crops are in splendid condition.

In places in the valley grasshoppers are appearing in destructive numbers and various measures are being adopted to control them, but they are doing no damage at the station.

Planting of potatoes in fields K and E was completed and about four acres of indexed seed was planted on the dry land on the Walker tract. A small plot of dry land was also planted to Cobblers.

The first cutting of alfalfa was harvested and stacked in good condition. The yield was very good, being much heavier than a year ago.

Scotts Bluff (cont'd)

Chancellor E. A. Burnett and L. F. Seaton, Operating Superintendent, of the University of Nebraska, visited the station during the week.

The storage in the Pathfinder and Guernsey Reservoirs was 866,000 acre-feet at the end of the week, a gain of about 26,000 acre-feet. The demand for water has not been heavy and the rotation of water has not begun.

The average maximum temperature for the week ending July 2 was 87° with a maximum of 92; the average minimum was 56, with a minimum of 51. The precipitation was 0.22 inch, making a total for the growing season of 6.75 inches, as compared with a total of 2.67 inches last year and a 20-year average of 7.06 for the same period. The average daily evaporation amounted to 0.224 inch. The average wind movement was 5.1 miles per hour.

The average temperature during the month of June was cooler than normal and was 6.5° cooler than last year. The precipitation for the month--1.99 inches--was also below normal as compared with an average of 2.40 inches, but it was more than four times what it was last year.

All crops have continued to make good growth. It has been comparatively easy this year to keep irrigation well in advance of the needs of the crops. The grain crop is heading and filling well. Under dry land conditions, however, the wheat crop is practically a failure. Wheat growers claim that it is the worst prospect they have ever had in this section.

At the station water has been run continuously and the alfalfa in field H and the plots in field K were irrigated, as was the grain in field C. A good stand of alfalfa has been obtained in all the fields. The alfalfa from the Walker tract was stacked. The potato plots were cultivated and harrowed during the week.

Drop lines are being put in on some of the field laterals. There has been a considerable drop in the cost of cement, from 90 cents to 65 cents a sack, making it a very favorable time for such work.

The storage in the Pathfinder and Guernsey Reservoirs continues to increase, it having reached a total of 880,000 acre-feet at the end of the week. This is nearly 505,000 acre-feet more than was in storage at this date last year.

At the station the first crop of alfalfa has been harvested. The maximum yield per acre was 2.32 tons, the minimum 1.10 tons, and the average 1.63 tons.

The prices of farm products are making considerable gains. Cattle and hogs have gained more than a dollar a hundred the past week and eggs have gained 1 cent a dozen. Butterfat, however, has dropped to 10 cents a pound. This being the pasture season is all that saves the dairy business, as this price would not by a considerable amount cover the cost of grain feed.

James A. Holden.

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M I S C E L L A N E O U S

Mr. S. H. Hastings, Principal Agronomist, will leave Washington on July 14 for a field trip. He will visit the following field stations of this division: Belle Fourche, Scotts Bluff, Newlands, Umatilla, Prosser, and Huntley. He expects to be gone about a month.

HARDNESS IN IRRIGATION WATER

In a letter dated June 29, 1932, Mr. L. R. Fiock, of the Bureau of Reclamation, El Paso, Texas, asked several questions concerning the effects of reactions between the salts carried in irrigation water and the soil to which that water is applied. The following letter, dated July 6, 1932, is a reply.

Your letter of June 29 is received. Your question relates to the effect on the physical condition of the soil of the cumulative deposition of lime and gypsum from the soil solution. It is assumed that such deposition occurs as the result of the concentration in the root zone of the solution applied as irrigation water; this concentration being the result in part of the loss of water by direct evaporation from the soil and in part by the absorption of water by plant roots. As the soil solution is thus concentrated it becomes saturated with respect to lime (calcium carbonate) and gypsum (calcium sulphate), and these two salts are then precipitated in the soil.

Now the specific question is: Does such precipitation of lime and gypsum in an irrigated soil have a cementing or binding action, or tend to form a hard-pan?

There are certain conditions under which a cemented or hard-pan layer may be formed in the soil through the precipitation of lime; but it is my belief, based on long experience, that these conditions exist very seldom if ever in irrigated land. They occur frequently in soils naturally rich in lime where the annual rainfall is not adequate to leach the root zone. Under such conditions a lime hard-pan may be formed in some zone below the soil surface where the precipitation of lime occurs chiefly as the result of the loss of carbon dioxide from the soil solution.

It is conceivable that such a hard-pan might be formed in irrigated land if the irrigation water applied each year were uniform in quantity and not adequate to result in an occasional leaching of the root zone. But such conditions are very unlikely to be met in irrigated land.

I think it is safe to assume that under the conditions you have on your project the formation of a lime or gypsum hard-pan is not likely to occur to any serious extent. It might occur in very limited areas as a secondary phenomenon where the soil profile includes some dispersed or impermeable silt which prevents the leaching of the root zone. But even in these areas I think that the normal processes of hard-pan formation would be impeded or masked by the accumulation of other salts of higher solubility.

Our experience both in the field and in the laboratory leads us to believe that the salts carried in irrigation water may have a profound influence on the physical properties of the soil through the chemical reactions of base exchange. With respect to the effects of these reactions, the salts fall into two groups. The salts of calcium and magnesium characterize one group and the salts of sodium and potassium the other. The effect on the soil of calcium and magnesium is in the direction of flocculating its colloidal material and thus

Hardness in Irrigation Water (cont'd)

making the soil friable to tillage and permeable to water. The effect of sodium and potassium is to disperse the soil colloids and make the soil gelatinous and impermeable to water. These two tendencies operate against each other when both groups of salts are present, and the final result is determined by the relative proportions of the salts of each group in the soil solution.

The salts of calcium and magnesium constitute what is known industrially as the hardness of water. For industrial purposes the hardness of water is measured by the absolute quantity of calcium and magnesium it contains (computed as calcium carbonate). For irrigation purposes the hardness of water is determined not by its absolute quantity of calcium and magnesium but by the relative proportions of calcium and magnesium on the one hand to sodium and potassium on the other. Thus if the sum of the milligram equivalents of the calcium and magnesium equals the sum of the milligram equivalents of sodium and potassium, we say the water is neutral. If the sum of the first two is greater than that of the second pair, we say the water is hard, and its degree of hardness depends upon the dominance of the first pair over the second pair. On the other hand, if the sum of the calcium and magnesium is less than that of the sodium and potassium, we say the water is soft, and its degree of softness is measured by the ratio of the two groups of constituents.

Because the final effect on the physical condition of the soil is determined by proportion of these constituents to each other, we say that "a hard water makes soft land and a soft water makes hard land."

This leads us to emphasize at least two characteristics of an irrigation water or of a soil solution. One of these is its total salinity as measured by specific electrical conductance or total salts expressed as in parts per million. The other is its relative hardness as measured by the ratio $Ca+Mg : Na+K$; or by the softness factor derived from the equation $\frac{Na+K}{Ca+Mg} =$ softness factor. Thus when the softness factor is less than 1 the water is said to be hard, and as the value of the factor decreases, the quality of the water from this point of view improves. We have chosen this form of the equation so that lower values would indicate better quality in the same sense that lower values of total salinity indicate better quality.

I have gone into this subject in some detail because it seems desirable that you should understand our present views with respect to the effects of the basic constituents of the salts of irrigation water on the physical condition of the soil. If I have not made myself clear, I hope you will not hesitate to tell me what points need further elucidation.

C. S. Scofield.

W E E K L Y R E P O R T S

Of the Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV July 9 and 16, 1932 No. 15

Huntley

The maximum temperature during the two-week period ending July 9 was 97 and the minimum 40. The precipitation was .14 inch.

The weather continued hot and dry and the irrigation requirements were high. With normal high water in the river it has been possible to fill the canals to capacity at all times and to deliver water to all users as required. Crops on the project are for the most part in good condition, and beets are especially well advanced for this season of the year. Dry lands are rather deficient in moisture for maturing grains, and yields in many cases will probably be cut due to drouth during the past three weeks, although fair yields are still in prospect in most sections.

Station work during this time included stacking of first cutting alfalfa and irrigation of beets, grains, and alfalfa. The average yield of the first cutting of alfalfa in the irrigated rotations was 1.45 tons per acre. The yields of the variety test in field O were as follows:

Average of		Tons per acre
3 plots	Grimm	2.35
2 "	Ladak	2.55
2 "	Common	1.94
2 "	Cossack	2.09
2 "	Baltic	1.90

Station visitors were Professors Clyde McKee and H. E. Morris, of the Montana State Station, and LeRoy Moomaw and W. E. Baird, of the Division of Dry-Land Agriculture.

The maximum temperature during the week ending July 16 was 96 and the minimum 48. The precipitation was .03 inch.

Hot and dry weather prevailed during this period, making the continued heavy use of irrigation water necessary. In general, crop conditions are good. It is reported that the sugar beet webworm is causing some damage in other sections of the valley, although locally there has been none.

The harvest of winter wheat on dry lands was begun. Drouth during the past month will reduce local yields to some extent, although there is still a fair crop.

A district meeting of county agents, held at the station on July 16, was attended by eight county agents from this section of the State as well as by extension leaders from the State College. The day was spent in going over the work of the station and in discussing extension activities for the year.

Mr. J. O. Belz, of the Division of Genetics and Biophysics, visited the station on July 15.

The annual Huntley Project Picnic will be held in the Project Park at the station on July 22.

Dan Hansen.

Newlands

The average maximum temperature for the four-week period ending July 16 was 90.4, with a maximum of 98 on June 30; the average minimum was 53, with a minimum of 43 on July 14; and the mean was 71.7. The average hourly wind movement was 2.95 miles. There was no precipitation.

The peak storage in the Lahontan Reservoir lacked about 30,000 acre-feet of reaching its total capacity of 276,000 acre-feet. The indications are that the present irrigation season will end with some 100,000 acre-feet in storage. This amount of water, with a normal snowfall in the mountains this winter, should assure sufficient water for irrigation purposes next year.

The present prices of farm products remain low, with no immediate prospect for an improvement. Butterfat is quoted at 17 cents, veal 3½ cents, lambs 4½ cents, eggs 16 cents, and hay $4.00 to $5.00 a ton in the stack. The price of hay is the lowest in years. Most of the dairy farmers produce their own hay, very little being purchased for feed. The greater part of the hay sold is purchased by stockmen for winter feeding of cattle or by a local alfalfa mill for grinding. The meal is shipped to points outside the State.

The field work on the station has consisted of irrigating, cultivating corn, harvesting the first crop of alfalfa, and cutting barley. The average yield of the various plots of alfalfa was 1,990 pounds per acre, which was much smaller than usual for the first crop of hay. This was about 1,000 pounds less per acre than the average of the first crop last year. This decrease was due, in all probability, to the cool weather and a heavy infestation of weevil.

The orchard received a heavy irrigation on June 28. The trees appear to be in good shape. The new plantings are doing well, and the percentage of loss will be quite low. There seems to be a good setting of apples and fair settings of peaches and plums. The yield of apricots was light, and in many cases brown rot was present. The presence of so many different species of insects in the orchard this year does not seem to have affected the fruit or trees to any marked extent. The work of the rosy apple aphis is manifest on a few apple varieties. Spraying, however, has reduced the minute pests to a minimum.

The laboratory work has consisted of the regular routine analyses of waters and a few soil samples. Analyses for boron have been completed on the new K series of wells. An exceedingly high content of boron was found in K-3 north well. It was more than 76 parts per million, the highest amount so far discovered in an underground water of this vicinity. This well is 12 feet deep and the casing is perforated from 3 to 12 feet. This area has been irrigated twice since being put into cultivation.

E. W. Knight.

Prosser

The maximum temperature for the week ending July 9 was 92°, the minimum 42.5, and the greatest daily range 44. Precipitation, on July 3, .05 inch.

The third irrigation has been applied to the apple orchard plots, which receive water every 30 days.

A Field Day has been planned at the Experiment Station for July 20.

Prosser (cont'd)

Markets: Hogs, 160 to 200 pounds, $5.00; No. 1 alfalfa hay, first cutting, $6.00 and $7.00 per ton; new potatoes, $18 to $20 per ton.

The maximum temperature for the week ending July 16 was 87°, the minimum 44, and the greatest daily range 36.

Farm work consisted of cutting weeds along flumes and hoeing potatoes in field E-6. No. 1 wheat plot was bound and shocked. The remaining four plots were not yet mature.

The release of irrigation water from the reservoirs amounted to about 13,000 acre-feet during the week. The amount held in storage is 640,357 acre-feet.

The price of choice hogs, 160-200 pounds, advanced to $5.50—an increase of 50 cents per hundred. Wheat futures declined to 34 cents per bushel, and eggs are now 15 cents per dozen.

During the week ending July 14 a total of 635 carloads of produce were shipped from the Yakima Valley as compared with 660 carloads for the corresponding week last year.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending July 9 was 88°, with a maximum of 91; the average minimum was 50, with a minimum of 50. The average wind movement was 7.2 miles per hour. The daily evaporation amounted to 0.298 inch. There was no precipitation at the station, but there were local showers in some other portions of the valley.

Grain is beginning to ripen rapidly. The hot, dry weather has made it necessary to commence irrigating the beets, and the extra demand for water has forced the district to begin the rotation system of irrigation.

The inflow into the Pathfinder Reservoir has dropped below the outflow, and the storage is decreasing; but the Pathfinder and Guernsey Reservoirs still contain over 850,000 acre-feet.

Work at the station has included the building of lateral structures, irrigating alfalfa in H and completing the plots in K, the grain plots in K and E, and the grain and alfalfa in field A.

Mr. J. O. Belz, of the Division of Genetics and Biophysics, visited the station the last of the week and inspected the equipment used for taking meteorological observations.

The prices for cattle and hogs have increased slightly the past week, but other products have held steady at last week's prices.

James A. Holden.

Yuma

The weather during the two-week period ending July 16 has been rather cool for this time of the year. The maximum temperature was only 99 on July 4, the lowest temperature recorded on this date since weather recording was started in this region. On July 14 and 15 the minimum temperature fell to 65 and 61, respectively. These minimum

Yuma (cont'd)

temperatures are unusually low for July. They made people get up during the night and dig out bed covers that had been packed away for the summer.

The fourth crop of alfalfa was cut during this period. The quality was good, but not so good as the second or third cuttings. It is difficult to prevent the loss of leaves during the high temperatures that prevail at this time of the year. Irrigation will be withheld from the alfalfa for the next several weeks to prevent the growth of grass. The acreage devoted to the production of alfalfa seed is considerably smaller this year than it was last year due to the low prices and slow sales. A part of the last two years' crop is still on hand. The quicker returns from hay is another contributing cause to the reduced acreage of alfalfa seed. The first seed was thrashed last week; the yields varied between 300 and 400 pounds per acre.

There has been an outbreak of "Kansas horse plague" in the valley during the last three weeks. About 15 cases have been reported so far. Last year there were about 100 cases, several of which resulted in death. The station had one case, which has recovered. One farmer, who lives just north of the station, lost three horses from this disease.

The technical name for this disease is Epizootic Encephalomyelelitis. It is supposedly caused by filtered passing virus, which produces an inflammation in the brain and spinal cord It is a rapidly spreading disease, especially during hot weather, but generally disappears as soon as cool weather begins.

The following station work has been performed during this period: Chopping milo, hoeing grass out of cotton, ditch repairing, harvesting alfalfa hay, and general irrigating.

Mr. R. McKee, of the Division of Forage Crops and Diseases, visited the station on July 14.

Summary of Climatological Data

Week ending	Temperature						Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.	Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean					
							Days	Days	Days
July 9	108	102.7	69	74.0	89.3	35	6	1	0
" 16	108	103.9	61	69.9	86.9	45	4	2	0

Note: No precipitation was recorded.

E. G. Noble.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV July 23 and 30, August 6 and 13, 1932 No. 16

Belle Fourche

The maximum temperature for the week ending July 9 was 84 and the minimum 47. The precipitation was .63 inch.

The thinning of the replanted beets was finished during the week. All grains and alfalfa were irrigated, potatoes and corn were cultivated, and weeds were cleaned up.

Mr. J. A. Clark visited the station on July 6.

For the week ending July 16 the maximum temperature was 98 and the minimum 53. The precipitation was .29 inch.

All the potatoes were sprayed with Paris green and Bordeaux mixture. On all early planted potatoes there seems to be a general outbreak of blight. All the beet plots were ditched for irrigation. The beets, variety beans, and soy beans in field G, and the potatoes and corn in fields A, G, and M-P were irrigated. Some time was spent in getting ready for the farm picnic on July 18.

For the week ending July 23 the maximum temperature was 100 and the minimum 54. There was no precipitation.

The eighteenth annual farm picnic was held on July 18. The weather was ideal. More than 700 cars passed through the gate, and it was estimated that over 2,000 people visited the station through the day.

The harvesting of barley was commenced and also the cutting of oats and barley on the dry land rotations. All the sugar beets were irrigated during the week. The continuous hot, dry weather ripened the grain, particularly on the dry land and consequently the quality will not be so good as was anticipated.

Mr. Hastings visited the station on July 17, 18, and 19.

During the week ending July 30 the maximum temperature was 96 and the minimum 56. The precipitation was .25 inch.

The second cutting of alfalfa was harvested in fields A, O, and P. The beets, beans, and potatoes in G and M-P were irrigated. The last of the week the potatoes and alfalfa in field A were also irrigated.

Threshing on the project has commenced, and the yields reported are considerably above average. The prices offered at the local elevator are 25¢ a bushel for wheat, 25¢ a hundred for barley, and 37¢ a hundred for oats. Very little grain is coming in at the prices offered. Those that can are holding their grain to feed or for a possible advance in price. Butterfat is bringing 14¢ a pound and eggs 13¢ a dozen.

For the week ending August 13 the maximum temperature was 96 and the minimum 47. The precipitation was .52 inch.

Belle Fourche (cont'd)

The potatoes and beets in field A were irrigated during the week. The variety barleys were threshed. This barley test was grown on disked corn ground in field O and received one irrigation. On Saturday the barley and oats were threshed in fields A and M-P. In the maximum production test the yield of oats was 108.7 and the yield of barley 68.7 bushels per acre.

The maximum yield of oats, 97.5 bushels per acre, was in rotation No. 69, and the minimum yield, 46.2 bushels, was in rotation No. 32. The average for all the plots threshed was 74 bushels per acre.

Dr. C. E. Leighty and Mr. John Stephens, of the Division of Dry Land Agriculture, visited the station on August 10.

Beyer Aune.

Huntley

During the week ending July 23 the maximum temperature was 98 and the minimum 47. The precipitation was .14 inch. Hot and dry weather prevailed during this period, although crops that have been sufficiently irrigated are in good condition.

Grains on dry land are being harvested, and in many cases yields will be short because there was not sufficient moisture for the crop to mature properly.

The harvest of the second cutting of alfalfa was started during the week; the yields will be fairly good.

The annual Huntley Project Picnic was held on July 22. The attendance was smaller than usual. President Alfred Atkinson, of the Montana College of Agriculture, was the principal speaker. Mr. J. Homer Hancock, of the Huntley Water Users' Association, gave a brief history of the progress of the project. This picnic celebrated the twenty-fifth anniversary of the opening of the project.

The maximum temperature for the two-week period ending August 13 was 100 and the minimum 42. The precipitation was .01 inch.

The weather continued hot and dry, and growing conditions were excellent for most crops. Conditions are particularly favorable for sugar beets. The pre-harvest estimate of yields of this crop is set by the Sugar Company at about 14 tons per acre for the entire district.

The harvest of the second cutting of alfalfa at the station was completed during this period. The average yield in the irrigated rotations was 1.46 tons per acre.

Yields of winter wheat on dry lands are reported to average 20 to 25 bushels per acre, but yields of spring wheat are much lighter.

Station work during this period included harvesting alfalfa, irrigating all crops except grains, and threshing all dry-land grains.

Mr. S. H. Hastings visited the station from August 5 to 7.

Dan Hansen.

Newlands

The average maximum temperature for the three-week period ending August 6 was 91.2, with a maximum of 98 on August 6; the average minimum was 51.2, with a minimum of 42 on July 20. The mean temperature was 71.2.

Newlands (cont'd)

The average hourly wind movement was 2.12 miles. There was a trace of precipitation.

The local prices being paid for farm produce have improved. Beef is selling at 6¢, pork at 5¢, lamb at 5¢, butterfat at 21¢, and eggs at 21¢. The small amount of hay that is being sold is still bringing $6.00 or $7.00 a ton.

The general condition of the farms of the project is about normal; that is, a normal crop of hay and grain will be harvested. Some further sales of dairy cows are reported from time to time. However, with the low price of hay there is a tendency to maintain the number of dairy animals at its present total. As a general thing the dairy cows on the project are not returning a profit to their owners, but they are furnishing a market for hay. Otherwise there would be a large surplus of hay without a market. As a result of the present butterfat prices a number of inferior cows have been slaughtered, thereby improving the quality of the herds.

At the station during this period the grain has been cut and threshed and the second crop of alfalfa harvested. Two irrigations have been given, one a general irrigation and the other to the pasture and the orchard.

Mr. Hastings visited the station on July 24 and 25. Mr. J. O. Belz, of the Division of Genetics and Biophysics, spent July 26, 27, and 28 at this station. During Mr. Hastings' visit detailed plans of future experiments were outlined and the results of last year's work was studied.

The average maximum temperature for the week ending August 13 was 87.3, with a maximum of 96 on August 7; the average minimum was 48.3, with a minimum of 43 on August 10. The mean temperature was 67.8. The average hourly wind movement was 3.02 miles. There was no precipitation.

The majority of the farmers are harvesting the second crop of hay. The indications are for a normal crop for this cutting. The wages being paid to laborers during the haying operations are $1.50 per day and board. This is the lowest wage paid in many years.

At the station one irrigation has been given. Those plots planted to oats, barley, and wheat have been threshed, and the second crop of hay has been cut.

E. W. Knight.

Prosser

The maximum temperature during the week ending July 23 was 97°. This was also the highest temperature for the year.

Farm work during the week consisted of irrigating and taking soil samples on plots 4, 5, and 6 in the apple orchard, binding the wheat in irrigation plots, and cutting alfalfa hay on the flood basin plots.

The thirteenth annual field day at the Experiment Station was held on July 20. Visitors registering for the field trip in the morning numbered 220 and many others arrived later.

Mr. J. O. Belz visited the station on July 23 to examine the meteorological instruments.

Prosser (cont'd)

The maximum temperature during the week ending August 6 was 97° and the minimum was 52°.

Prime steers are selling for $4.50 to $5.00 per hundred pounds and top prices of hogs are from $4.75 to $5.00. No. 1 alfalfa hay is selling for $6.00 to $7.00 per ton for the first cutting. Prices of new potatoes have declined to $11 and $12 per ton, which is the same price that was received for old potatoes six weeks ago. The prices of barley and oats have remained constant for the past two weeks at $11 and $14 per ton, respectively. Dairymen in the Yakima Valley were encouraged considerably by the advance of 3 cents a pound for butterfat, which is now selling for 15¢.

A threshing crew with their equipment arrived at the station during the week and threshed wheat. The yield from farm fields averaged 34.2 bushels per acre. This yield exceeded that of last year by 6 bushels per acre.

A comparison of the specific conductance of water from the Sunnyside Canal and the Yakima River, taken at weekly intervals, is shown in the following table.

Date 1932	Sunnyside Canal		Yakima R. (Prosser)		Approximate p.p.m.	
	Volume flow	$K \times 10^{-5}$ at 25° C.	Volume flow	$K \times 10^{-5}$ at 25° C.	Sunnyside Canal	Yakima River
	c.f.s.		c.f.s.			
June 25	1,285	12.3	4,030	19.6	86.1	137.0
July 2	1,301	13.9	1,200	23.8	97.3	166.4
" 9	1,309	12.8	420	30.3	89.6	212.0
" 16	1,309	13.3	140	44.4	93.1	310.0

The specific conductance of water from the Yakima River and the Sunnyside Canal was the same at a point three miles below the diversion dam near Yakima on July 9, 1932.

During the week ending August 13 the maximum temperature at the station was 100° on August 7 but declined to 75° on August 11. The minimum temperature ranged from 45 to 47° the major part of the week. A trace of rain fell August 11.

Irrigation water is being released from the storage reservoirs at the rate of approximately 6,000 acre-feet per day. Farm work consisted of taking soil samples and hoeing potatoes and corn.

Market fluctuations in the Yakima Valley were not extensive but the small increases were very encouraging. The price of butterfat is now 17¢ a pound, which includes an increase of 5¢ a pound during the last two weeks. Eggs have also advanced 2¢ a dozen and are now 17¢. Wheat advanced 4¢ a bushel and is now selling for 44¢. Oats advanced $1.00 a ton and are now being sold for $15. Hog prices decreased 25¢ per hundred and choice 160 to 200-pound hogs are now selling for $4.75 per hundred.

The first carload of Washington Bartlett pears have reached the eastern market and were sold at auction for $1.14 per box for the extra fancy grade. Also the first carload of Italian prunes have been shipped from the Kennewick district to be sold at auction in the eastern market. They are expected to bring a favorable price due to the reported shortage of prunes from the eastern districts.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending July 16 was 90°, with a maximum of 97; the average minimum was 61, with a minimum of 55. The precipitation amounted to 0.26 inch, making a total of 7.01 inches for the growing season. The average daily evaporation was 0.201 inch. The wind movement was 5.5 miles an hour.

The growth of crops has continued very satisfactory. While the precipitation for the week was small, it has been of some help in irrigation. Water has been run continuously. The barley and alfalfa seeding in fields A and C, alfalfa on the Walker tract, the beet plots in K and E, and most of the corn on both places have been irrigated.

The Pathfinder district has inaugurated the rotation system, and the heads where a steady run is used have been reduced. However, no crop is suffering from the dry weather and grain is filling out well.

The average maximum temperature for the week ending July 23 was 94°, with a maximum of 99; the average minimum was 61, with a minimum of 59. There was 0.02 inch of rain at the station. The average daily evaporation amounted to 0.271 inch. The wind movement was 3.9 miles per hour.

While the precipitation at the station was practically nothing, there were fairly good rains in some other sections of the valley. On the south side above irrigation the rain assumed cloudburst proportions and did considerable damage to the highway.

At the station water was run continuously throughout the week. All the potato plots and the replanted beet plots were irrigated. The Werner experimental plots of potatoes were cultivated and watered. The corn, potato, and bean plots, including those on the dry land on the Walker tract, were hoed. The barley in field C, the oat plots in fields K and E, and the winter wheat in K were harvested and shocked.

In some sections of the valley threshing has commenced. The price for new grain--barley and oats--is about the lowest it has ever been. The elevators are offering only 40¢ per hundredweight for barley and 60¢ per hundredweight for oats. Wheat is about the same price as last year--28¢ per bushel.

There was a slight recession in the prices of cattle and hogs during the week, but they are still considerably above the low mark of a month or so ago. The factory price for butterfat in whole milk has been 17¢ for some time.

Mr. S. H. Hastings, of the Washington office; Mr. W. W. Burr, Dean of the Nebraska College of Agriculture; and Mr. Beyer Aune, Superintendent of the Belle Fourche Field Station, visited the station during the week.

The storage in the Pathfinder and Guernsey reservoirs amounts to about 730,000 acre-feet. There is a net loss of about 9,000 acre-feet per day. The supply of water will be sufficient for the season.

The average maximum temperature for the week ending July 30 was 89°, with a maximum of 98; the average minimum was 59, with a minimum of 55. The precipitation amounted to 0.23 inch, making a total of 7.26 inches since April 1. The average daily evaporation was 0.217 inch. The wind movement averaged 5.7 miles per hour.

With the exception of the last two days the week was hot and dry and water was run continuously. The precipitation came in three small

Scotts Bluff (cont'd)

showers, but the weather was cool and cloudy and the air was saturated. The precipitation is steadily falling below the normal, which is 8.72 inches to this date.

Beets and corn plots in fields K and E were irrigated during the period and the potatoes were given another cultivation. All of the alfalfa on both places has been shocked, but the rain the latter part of the week delayed the stacking. The yield of the second cutting seems to be very heavy. The cutting of grain was continued and is all harvested now except the wheat plots in field K and one or two small plots in field C and on the Walker tract.

There have been many local showers over the valley, some of them amounting to heavy rains. Threshing is quite general over the entire section. Yields in the dry land areas are low.

Prices on livestock are holding the recent gains. Butterfat has advanced to 14¢, the highest it has been for several months, and eggs increased 3¢ per dozen last week, this being the highest price received since last January. There has been no advance in the price of grain. Beet growers feel a little encouraged over recent advances in sugar prices.

The average maximum temperature for the week ending August 6 was 91° with a maximum of 95; the average minimum was 54, with a minimum of 49. There was no rain. The daily evaporation has averaged 0.249 inch. The average hourly wind movement was 5.2 miles.

The month of July has been hot and dry. While the temperatures have not been as high as last year, yet the month's average was 90° as compared with 91 last year. The average minimum was also 1° below last year's average of 59. The precipitation for the month was 0.26 inch as compared with 0.39 inch last year and a 20-year average of 1.16 inches. However, the water supply was abundant and the crops came through the month in good shape.

During the week the alfalfa hay on the Walker place was stacked. The chicken houses were cleaned of the old sand and fresh sand put in, preparatory to putting the pullets in the laying houses. One unit has been filled with the earlier developing pullets which have commenced laying.

We are getting ready for the station picnic, which will be held on August 11.

On Monday afternoon at 3:30 a break, presumably from a gopher hole, occurred in the Interstate Canal at about Mile 50 just across the State line in Nebraska. At this point the ditch was carrying 1500 second-feet. The break came in a fill and when found was flowing through the bank in such volume that it could not be checked. Some 200 feet of bank was carried out for 8 or 10 feet below grade and considerable damage was done to farms below. Two draglines from the Nebraska highway department were taken from near-by work and two from the district were at work within a few days. About 2,000 feet of entirely new ditch will be built, involving some 70,000 yards of excavation. It is expected that water will be back in the laterals within two weeks. At the end of the first week crops generally are not suffering greatly, but it will probably reduce the yields of beets and potatoes very considerably if there are no rains during the next week.

The average yield of the second cutting of alfalfa on the station was 1.52 tons per acre.

Scotts Bluff (cont'd)

The average maximum temperature for the week ending August 13 was 93°, with a maximum of 106; the average minimum was 58, with a minimum of 47. The precipitation amounted to 0.14 inch, making a total of 7.40 inches for the growing season. The evaporation amounted to a daily average of 0.205 inch. The average hourly wind movement was 5.8 miles.

The annual station picnic was held on August 11. The attendance this year was not as large as was expected. A greater interest is being taken in the club work, and this part of the program is assuming considerable importance. Representatives from the Nebraska Agricultural College were present and held judging schools in both the livestock and home economics clubs. This was a district meeting comprising the counties in the Panhandle section. It was the first one of the kind to be held, but will probably become a regular feature of the picnic and may be extended to include the counties in eastern Wyoming that are a part of the North Platte project.

The break in the canal was repaired sooner than was expected and water was turned through it on Tuesday. Water was turned into the laterals, and deliveries in small heads were begun on Saturday. The canal will be filled to its capacity by the middle of next week. Crops have not suffered as greatly as was feared, but the loss in yield of both potatoes and beets will be considerable.

The storage in the Pathfinder and Guernsey reservoirs totals 587,000 acre-feet at the end of the week.

There has been little change in the price of livestock during the week. Fat cattle made a gain of about 25¢. Eggs have advanced on the local market to 16¢ a dozen and butterfat is up to 17¢ a pound for sour cream. Feed prices are still declining, so that the dairy and poultry industries are in a favorable condition. Bran is selling at 50¢ a hundred pounds and other feeds in proportion.

James A. Holden.

Umatilla

During the week ending August 6 the maximum temperature was 101 and the minimum 52. Soil-moving winds prevailed during one 24-hour period. No precipitation was recorded.

Work with tractor, teams, and labor continued in the development of the southwest 40 acres for plot land. When completed this field will have 106 quarter acre plots. The first series of 21 plots is nearly finished.

The sweet clover pasture was irrigated. Some water was applied to the second series of the plot land. The soil is so dry that wetting prior to grading greatly facilitates the work.

Mr. S. H. Hastings, accompanied by Mr. Carl A. Larson of the Prosser station, visited this station on August 2 and 3. Mr. M. R. Lewis, of the Bureau of Agricultural Engineering, who is stationed at Corvallis and who has been cooperating in the engineering features of the development of the station, was here to confer with Mr. Hastings.

The week ending August 13 was generally cooler and cloudy or partly cloudy. The maximum temperature was 101 and the minimum 52. There was no precipitation. Soil-moving winds prevailed four days during the week.

Umatilla (cont'd)

Work with tractor and team on the plot land was continued. The irrigation system was completed for the first series, and the plots were given an irrigation to determine the high and low points. The concrete piers were poured for the bridge across the feed canal which will make accessible the upper 30 acres of the station.

On Saturday the local turkey growers while on a tour spent an hour on the old station site inspecting the turkey experiments in progress there. The growers, numbering 140, were very much interested in the explanations of the various tests. Four lots of 100 turkeys each are fed: (1) mash and scratch without green feed, (2) mash and scratch with 10 per cent alfalfa leaf and blossom meal added to the scratch, (3) mash and scratch with chopped green alfalfa, and (4) mash and scratch with access to alfalfa pasture. All the turkeys are kept under confinement. The general opinion of the growers was that these turkeys were at least as well developed as any in the vicinity and far better than the average. The starting and developing mashes were devised by the station in cooperation with the Extension Service and have become standard over the greater part of Oregon.

Official visitors were Mr. M. A. McCall, Chief of the Division of Cereal Crops and Diseases, and Mr. D. E. Stephens, of the Moro (Oregon) Station.

H. K. Dean.

Yuma

The temperature returned to normal after a period of relatively cool weather. The mean maximum for the week ending July 23 was 108.4, mean minimum 70.3, greatest daily range 42. Two days during the week were partly cloudy, but the rest were clear. There was no precipitation. With the exception of a few slight traces, there has been no rain since February 19.

The milo was planted on June 27 and July 2, and a good stand came up on most plots. The first planting was thinned when the plants were from 2 to 4 inches tall. This thinning proved to be an unwise practice this year as an infestation of worms reduced the stand below the point desired and some plots had to be replanted. This worm has not been definitely identified, but it is probably the larva of the Lesser Corn Borer. It attacks the plant at ground level by boring into the stalk and forming a web in the soil by the stalk into which the larva retreat when not feeding.

The alfalfa and sweet clover seed was threshed during the week. There was a wide variation in the Yields of three plots of alfalfa, from 72 to 656 pounds per acre. In five-year rotation No. 56 (one year of barley and grain sorghum, three years of alfalfa, and one year of cotton) the first year of alfalfa receives 500 pounds of acid phosphate. The alfalfa during the second and third years is not fertilized and is allowed to go to seed. The second year alfalfa yielded 308 pounds, while the third year yielded only 72 pounds per acre. The highest yield was obtained in six-year rotation No. 64, consisting of three years of cotton and three years of alfalfa. The yield of third year alfalfa seed was unusually high this year, producing 656 pounds per acre. Each year the

Yuma (cont'd)

alfalfa in this rotation receives 300 pounds of acid phosphate. The variation in yields is probably due to the quantity and method of application. The fertilizer affects not only the quantity of plant growth and set of seed but the stand as well.

Station work during the week consisted of threshing, hauling hay, cleaning irrigation ditches of grass and weeds, chopping milo, and general irrigating.

Max E. Crannell.

M I S C E L L A N E O U S

A paper entitled "Measuring the Salinity of Irrigation Waters and of Soil Solutions with the Wheatstone Bridge," by Carl S. Scofield, has been published as Circular No. 232 of the U. S. Department of Agriculture.

Mr. S. H. Hastings, Principal Agronomist, has returned to Washington from a western field trip.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV August 20 and 27, 1932 No. 17

Belle Fourche

For the week ending August 20 the maximum temperature was 92 and the minimum 55. The precipitation was 1.58 inches.

During the week all potatoes in fields A, B, G, and M-P were sprayed with bordeaux mixture and paris green. This is the third application of bordeaux mixture, and blight has been kept well in check to date.

On August 14 a hailstorm struck a strip about two miles wide, north and south across the project. The station was just on the edge of this strip, and very little damage was done to crops on the station.

The threshing of the variety oats and wheat was completed during the week. In the irrigated wheat varieties the maximum yield was 43.1, the minimum was 28.9, and the average was 36.8 bushels per acre. In the irrigated oat varieties the maximum yield was 104.7, the minimum was 77.6, and the average was 97.1 bushels per acre. The wheat was grown on disked beet ground, and received two irrigations. The oats were grown on disked beet ground and on disked corn ground. The oats received two irrigations.

The annual beet tour of the project will be held on August 29.

Beyer Aune.

Huntley

The maximum temperature during the week ending August 27 was 95 and the minimum 47. The precipitation amounted to .36 inch.

Crops on the east end of the project were seriously damaged by a hail-storm which occurred on August 23. The storm area reached from Worden to Pompeys Pillar. The greatest damage was to sugar beets, and the yields of this crop on about 2,000 acres will probably be cut about 2 tons per acre. There was no hail at the station nor on the upper end of the project.

Threshing of grains, excepting oats, was completed during the week. In the wheat variety test the Pringle variety made the highest average yield--86.3 bushels per acre, while Reward made the lowest yield--59.3 bushels per acre. The average yield of all varieties was 73.6 bushels per acre.

Other station work included repairing the irrigation system and roads and irrigating.

Dr. C. E. Leighty and Mr. J. M. Stephens, of the Division of Dry-Land Agriculture, were station visitors on August 21.

Dan Hansen.

Newlands

The average maximum temperature for the week ending August 20 was 90.3, with a maximum of 94 on August 18 and 19; the average minimum was 47.9, with a minimum of 45 on August 15. The mean was 69.0. The average hourly wind movement was 2.24 miles. There was no precipitation.

The second crop of hay is making an average yield. The prospect is for a normal hay crop this year with prices the lowest in years. The low prices of hay should help the dairymen.

The need for economy in station funds has made it necessary to use labor as sparingly as possible. Just enough men are being employed to do the work that is necessary in continuing the station activities that have been in progress. No additional experiments are being planned.

At the station the second crop of hay has been cut and stacked. The maximum yield was 4944 pounds per acre, the minimum was 1596, and the average was 3454.

The average maximum temperature for the week ending August 27 was 90.5, with a maximum of 94 on August 24 and 25; the average minimum was 48.5, with a minimum of 41 on August 21 and 22. The mean temperature was 69.5. The average hourly wind movement was 2.27 miles. There was .01 of an inch of precipitation.

The work at the station during the week has consisted of irrigating, planting alfalfa, and cultivating corn. Alfalfa was planted in the wheat stubble on B-7 to 17. Sweet clover was planted in the barley stubble on D-2 and D-5.

Prices as low as $3.50 a ton are being offered for hay in the stack. Buyers are offering, in some cases, $50 for dairy cows, but at present very few sales are being made. Farmers are holding their stock and produce in hope of receiving a better price.

E. W. Knight.

Prosser

The maximum temperature for the week ending August 20 was 96 and the minimum was 48. During the middle of the week the maximum reached points above 90° on four days.

There were 454,355 acre-feet of water held in storage on August 20. In 1931 at this time there were only 176,469 acre-feet.

The plots in the apple orchard that are irrigated every 30 days will receive their last irrigation the coming week. The alfalfa irrigation plots on field E-5 will receive one more irrigation.

The maximum temperature for the week ending August 27 was 93, the minimum 50, and the greatest daily range 38. During the first part of the week .1 of an inch of rain fell. This was the first rainfall since July 3.

Water was diverted from the Yakima River to the new power canal at the Prosser Dam the first of the week. The middle section of the canal, which was not concrete lined, has been leaking badly because of the gravelly condition of the soil.

Twelve hundred more carloads of produce were shipped from the Yakima Valley in 1931 than in 1932.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending August 20 was 93, with a maximum of 96; the average minimum was 60, with a minimum of 57. The precipitation amounted to 0.71 inch, making a total of 8.11 inches for the season. The average daily evaporation was 0.213 inch. The average hourly wind movement was 5.5 miles.

The first rain of any consequence since June 16 occurred this week. It was local in character, seemingly being the heaviest at the station where it measured 0.71 inch. No hail accompanied it. However, there was hail on the south side in the dry land district that caused considerable damage. Over a thousand acres of wheat that was late in being harvested was ruined and a large acreage of alfalfa was destroyed.

The early potato crop in the valley is being marketed. The yield and quality are poor, and the price is from 35¢ to 40¢ a hundredweight.

The work at the station has consisted chiefly in irrigating, water being run both day and night. Two men irrigate through the day on sugar beets and at night two others irrigate the potatoes. The plots in fields K and E and the beets on the Walker place were covered, and the alfalfa plots in field K were being watered at the end of the week. The dry land crops on the Walker place--beans and potatoes--were benefitted considerably by the rain, but the corn is too badly damaged to amount to anything.

The average maximum temperature for the week ending August 27 was 87, with a maximum of 98; the average minimum was 58, with a minimum of 55. The average wind movement was 5.2 miles per hour. The precipitation measured 0.69 inch, making a total for the season of 8.80 inches. The evaporation averaged 0.177 inch per day.

The week has been favorable for crop growth. The last four days were cloudy and damp, the precipitation occurring on the 24th, 25th, and 26th. It assisted greatly in irrigation. At the station the work of irrigating is fairly well caught up. The rains of the past two weeks have been very helpful to the current seeding of alfalfa and sweet clover, much of which had not been irrigated since the break in the canal. The rains have been general over the project. A rather destructive hail accompanied one of the rains, though the affected territory was small. It started at Morrill on the north side and followed a southeasterly course across the river and into Mitchell Valley a short distance. Crops were badly damaged within this territory.

Water has been run continuously throughout the week, a good head being furnished. The alfalfa and beet plots in fields K, E, and C were irrigated and the alfalfa in field H almost covered.

Grain threshing was finished during the first of the week. The maximum yield of oats in field K was 87.3, the minimum 24.8, and the average 58.3 bushels per acre. In field E the maximum yield of oats was 72.4, the minimum 39.5, and the average 53.3 bushels per acre. Barley in the larger fields in A, C, D, and E and on the Walker place yielded at the rate of about 65 bushels per acre. The average yield of wheat was 15 bushels per acre.

The storage in the Pathfinder and Guernsey reservoirs at the end of the week was 445,000 acre-feet.

The early potato crop is being harvested, but the market is very dull, and the few buyers are offering only 30¢ per hundred for the best quality.

James A. Holden.

Umatilla

For the week ending August 20 the maximum temperature was 95 and the minimum 54. There was no precipitation. Soil-moving winds prevailed on four days.

All the alfalfa and sweet clover were irrigated during the week. Grading the plot land was continued with tractor and team. The plots already finished were given a final irrigation and light grading where necessary preparatory to "strawing."

Mr. Albert Burch, of Medford, Oregon, member of the State Board of Higher Education, acting as a committee of one, visited this station while on an inspection trip of the stations in eastern Oregon. He was accompanied by Director W. A. Schoenfeld, of the Oregon Experiment Station, and Mr. D. E. Stephens, of the Moro station.

Mr. S. H. McCrory, Chief of the Bureau of Agricultural Engineering, Mr. W. W. McLaughlin, Chief of the Division of Irrigation, and Mr. M. R. Lewis, in charge of the irrigation work in Oregon, held a conference with the superintendent relative to the proposed irrigation experiments on the station.

The maximum temperature for the week ending August 27 was 95 and the minimum 52. There was no precipitation.

This has been the coolest summer during the 20 years that records have been kept at the station. On July 21 the temperature was 101, which was the only temperature in excess of 100, while during an ordinary summer there are 15 or more days when the temperature is over 100.

The routine work of the station continued, but most of the labor was employed on grading.

Official visitors were Dean Geo. W. Peavy, of the School of Forestry, Corvallis, and Geo. Miller, of the State Forester's Office, who inspected the trees on the station that were distributed under the Federal-State cooperative arrangement.

Mr. T. W. Botkin, who has been in charge of the turkey experiments on the station since March 1930, died in the Veterans Hospital in Walla Walla. For the present the turkeys are being cared for by one of the laborers. The future of this work is rather uncertain on account of Mr. Botkin's death.

H. K. Dean.

Yuma

The maximum temperature for the two-week period ending August 20 was 112, mean maximum 105, minimum 58, mean minimum 71. Six days were partly cloudy and eight days were clear.

Weather conditions in the mountainous sections to the north and east of the project have caused a wide variation in local temperatures. The minimum of 58 on the 11th was the coolest night since early in June. For five days following the 11th the minimum temperature was 66 or under. These cool nights are greatly appreciated. The maximum of 112 on the 5th and 20th is the highest recorded for the year.

The cloudy days have been caused by storms in the distant mountains. No rain fell on the project. The humidity, however, has been extremely high.

Climatic conditions in general have been very favorable for project crops. The cool nights which have occurred at rather frequent intervals and the absence of any prolonged period of high minimum temperature

Yuma (cont'd)

have probably caused less shedding of cotton than in previous years. The present indications are that there will be a good yield. Picking and ginning have started, but less than a hundred bales have been turned out to date.

With the exception of one rain late in July, the weather has been very favorable for alfalfa seed harvesting. The yields are not up to normal as a whole, but the quality is high. Very little seed is being sold. The farmers in most cases are drawing an advance of 3 cents per pound from warehouses and recleaning establishments to cover the threshing and recleaning charges. There is plenty of last year's seed on hand, so prices will probably hold to a figure around 6 to 7 cents a pound.

The flow of the Colorado River has dropped to less than 13,000 second-feet. Much of this flow is the result of rains on the watershed of the Little Colorado River.

Station work during this period included the plowing and soil preparation of fall gardens, cultivating mesquite eradication areas, cultivating grain sorghum plots, cleaning ditches, pruning ornamental shrubs, and general irrigating and hoeing.

Mr. J. O. Belz, of the Division of Genetics and Biophysics, visited the station on August 4 and 5. The weather responded with a maximum of 112 and a minimum of 78 on those two days.

E. G. Noble.

M I S C E L L A N E O U S

Special Notice

Because of a 40 per cent reduction this fiscal year in the Bureau of Plant Industry's allotment for blank paper, it is necessary for each division to economize rigidly in order that the supply may be sufficient to last throughout the year.

It has been determined that this division may effect a material saving of mimeograph paper by condensing certain material, particularly lengthy reports and detailed tables heretofore appearing in this bulletin. This policy with respect to the weekly reports will be followed at least for the remainder of this fiscal year.

However, the station reports should be sent in with as much detail as heretofore in order that the Washington office may be kept fully informed regarding the activities of the various stations and the more important developments on the projects where they are located.

S. H. H.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV September 3 and 10, 1932 No. 18

Belle Fourche

For the week ending September 3 the maximum temperature was 86 and the minimum 42. The precipitation was .34 inch.

The annual beet tour was held on August 29 and was started in Spearfish Valley. The experimental plots conducted at the farm of the Sugar Company by the U. S. Department of Agriculture were inspected and explained by Mr. Nuckols, who has charge of this work. Several farms were inspected down the valley, including the sugar beet plots in the irrigated rotations on the field station. At noon the Sugar Company served dinner here at the field station. A short program followed, after which the tour was continued down through the Vale district. Some 125 attended and much interest was shown in the work.

The Butte County fair was held at Nisland September 1 to 3. The attendance was above the average. Admittance to this year's fair was free. The exhibits were up to the usual standard with the exception of livestock. The poor livestock exhibit was partly due to an anthrax scare that was reported shortly before the opening of the fair.

On August 31 Dr. Schreiner and Mr. Lyons, of the Bureau of Chemistry and Soils, visited the station. Director Wilson, of the State College, visited the station September 2 and 3, and Mr. D. A. Spencer, of the Bureau of Animal Industry, arrived on September 3.

Beyer Aune.

Huntley

The maximum temperature during the week ending September 3 was 89 and the minimum 37. The precipitation was .50 inch.

This rainfall was the heaviest since June and was of benefit to dry lands in preparing seed beds for winter wheat. Cool weather prevailed during the week and frost damage was reported from some of the higher valleys, although there was no damage to crops locally.

The season has been very favorable for corn, and the acreage planted to this crop is larger than for several years past. Corn and feed grains, including barley and wheat, have replaced to a large extent the acreage formerly devoted to beans due to the low prices for the latter crop.

The annual Huntley Project Fair was held in Project Park on September 3. In addition to the usual exhibits of agricultural produce and domestic science exhibits, a 4-H baby beef show was held. There were some very creditable entries in this exhibit which created a good deal of interest.

Dr. Oswald Schreiner, of the Bureau of Chemistry and Soils, visited the station during the week to inspect the work with sugar beet fertilizers.

Dan Hansen.

Newlands

The average maximum temperature for the week ending September 3 was 82.6, with a maximum of 89 on September 3; the average minimum was 43.4, with a minimum of 34 on August 30. The mean temperature was 63.0. The average hourly wind movement was 1.9 miles. There was .01 of an inch of precipitation.

Second crop haying on the project has been completed. The yields for this cutting were about normal. It is expected that the hay crop will be about 80 per cent of normal this year.

The State has purchased a new herd sire to be used a little later to head the Holstein herd at this station.

The work at the station has consisted of cultivating the corn and irrigating. The orchard was irrigated on August 31, and as a whole is in good condition. The new trees, set out during the past spring, are all living with a few exceptions. Irrigations have been more frequent during this season than heretofore; and if any of the new plantings should die, water will not be a contributing factor. Practically all the fruit has been harvested except the late apples and a few late peaches. Moderate yields for all varieties has been the general trend. The quality of the fruit has been good, with very few specimens showing insect or scale injury. The orchard was cultivated to destroy weeds during the early part of the season, and this seems to have helped the trees.

The laboratory work has been intensive during the past month. In addition to the water samples regularly collected on the station, more than half of the total number of project samples submitted since the first of the year came in during August.

The number of wells on the station area being regularly sampled and measured now total 82, with the drain samples, tap, and irrigation supplies in addition. From the data that is being accumulated as a result of the analysis of these samples a true picture of the underground water conditions is gradually being revealed.

The average maximum temperature for the week ending September 10 was 90.1, with a maximum of 94 on September 6 and 7; the average minimum was 45.7, with a minimum of 41 on September 10. The mean temperature was 67.9. The average hourly wind movement was 1.16 miles. There was no precipitation.

The work at the station has consisted of one irrigation and the cultivation of crops.

The State Experiment Station has laid concrete floors in five hog pens during the past week. These pens will be used as feeding pens during the winter months and as farrowing pens in the spring.

E. W. Knight.

Prosser

The maximum temperature for the week ending September 3 was 83° and the minimum was 37.

The final irrigation of the apple orchard plots receiving water every 30 days is almost completed. A considerable portion of the data has already been arranged.

The dairy farmers received some encouragement by an increase of 1¢ a pound for butterfat.

Prosser (cont'd)

The specific conductance of water samples from the Sunnyside Canal and the Yakima River, with the volume flow of water and the approximate parts per million of salt carried.

Date 1932	Sunnyside Canal		Yakima R. (Prosser)		Approximate p.p.m.	
	Volume flow	$K \times 10^{-5}$ at 25° C.	Volume flow	$K \times 10^{-5}$ at 25° C.	Sunnyside Canal	Yakima River
	c.f.s.		c.f.s.			
July 23	1300	12.5	1380	37.5	87.5	264
" 30	1300	13.9	1135	41.7	97.4	292
Aug. 6	1300	14.4	993	41.7	100.6	292
" 13	1300	12.5	1290	37.5	87.5	264
" 20	1260	13.9	1030	44.1	97.4	309
" 27	1200	12.5	1000	46.8	87.5	327

The maximum temperature for the week ending September 10 was 94°, the minimum 40, and the greatest daily range 46.

On September 10 347,338 acre-feet of water was held in storage compared to 72,149 acre-feet held at the same date in 1931.

The third crop of alfalfa will be cut next week. It is not as mature as were the two previous crops, but in order to insure good curing weather it will be cut a little early.

September 7 and 8 were spent in the Walla Walla district making general surveys in preparation for water requirement studies.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending September 3 was 80°, with a maximum of 88; the average minimum was 46, with a minimum of 35. The average wind movement was 5.1 miles per hour. No precipitation was recorded at the station. The daily evaporation averaged 0.185 inch.

The month of August was extremely hot; with the exception of 1929 it was the hottest since records have been kept at the station. The average maximum was 90, one degree above last year and 5 degrees above the average. The average minimum was 57°. The precipitation for the month was 1.54 inches as against a 23-year average of 1.73 inches.

The sugar beet crop is making good growth, and from tests made by local chemists the sugar content is very good, being almost 14 per cent on September 1. The storage of sugar in the beet will be more rapid from now on, and there will also be a greater increase in the size of the beet. It is estimated that the tonnage will be much above the average this year.

The early potato crop is practically a failure so far as income is concerned. At 30¢ per hundred many fields will not pay harvesting costs. Reports from various sections indicate that the late crop will show very low yields.

Water has been run continuously throughout the week. The potato plots in fields K, E, and C were irrigated. The alfalfa in field H and the time-of-planting beet plots on the Walker tract were also watered. The storage in the reservoirs at the end of the week was 395,000 acre-feet.

Scotts Bluff (cont'd)

There has been little change in the price of farm products. Grain prices are so low that little is being marketed. Probably more local grain will be fed this winter than usual.

The average maximum temperature for the week ending September 10 was 83°, with a maximum of 95; the average minimum was 47, with a minimum of 40. The precipitation was 0.02 inch, most of it coming in the form of very heavy dews on two successive nights. This makes a total for the season of 8.82 inches. The average wind movement was 4.7 miles per hour. The daily evaporation amounted to 0.171 inch.

During the week the filling of the silos was completed, and all of the corn was cut. The third crop of alfalfa was cut, raked, and shocked. The yield on the station fields was good, but on the Walker tract it will be rather light.

The variety bean plots, both under irrigation and dry land conditions, were harvested, and small blocks in each plot were used to estimate yields. Throughout the valley the harvesting and threshing of beans has progressed during the week, and very good yields of excellent quality have been reported, some as high as 40 bushels per acre of No. 1 beans. Great Northerns are bringing a price of $1.65 per hundredweight or about $1.00 a bushel. On the higher yields this is a very satisfactory return.

During the week the alfalfa plots in fields K, E, and C were irrigated. They have made a good growth and indicate a yield above the average.

The representatives of the various reclamation projects in the valley have at last been successful in their efforts to have the profits from the operation of the Government power plants that had been allotted to the fifth class lands distributed to the first four classes, which only pay construction costs. The Secretary of the Interior has authorized the transfer of some $108,000 of power profits to construction costs against the first four classes of land. This is sufficient to take care of the next year's levy, thus freeing the lands from another year's payment.

Superintendent Hildreth, of the Horticultural Station at Cheyenne, Wyoming, visited the station the past week.

At Omaha the top prices for steers was $9.75 and for hogs $4.25. Feeder lambs are selling for about 5¢ a pound. A few have been contracted on the range at 4¢, but little contracting has been done. The Holly Sugar Company is again planning to enter into a contract with beet growers to feed steers on a gain basis. Last season about 4,000 head were handled in this manner with satisfactory results to both parties.

Butterfat is now selling at 16¢ a pound.

James A. Holden

Umatilla

During the week ending September 3 the maximum temperature was 87 and the minimum 42. On four days during the week severe winds prevailed. No precipitation was recorded.

On the run in front of the buildings the labor was employed in working over 4 or 5 acres which was seeded last spring and on which the stand was not very satisfactory. All of the other alfalfa and sweet clover were irrigated. The 50-foot, 10-ton capacity bridge across the feed canal was completed. This will give access to the 30 acres of the station above the canal.

Umatilla (cont'd)

A group of six pathologists and county agents from institutions in the States of Washington and Idaho spent a half day going over the curly top tests conducted in cooperation with the Division of Horticulture. This year 722 tomato, 1015 bean, and 61 squash varieties, strains, and crosses were under trial. The bean selections, mostly of the Great Northern and Pinto varieties, have shown considerable resistance to curly top, but most of them are rather highly infected with the mosaic disorder. Seed from 16 is being saved for further trial. As in past years, the tomato varieties were all attacked by the curly-top disease.

Official visitors were Dr. C. E. Leighty, of the Division of Dry Land Agriculture, and R. B. Webb, of the Moro Station.

During the week ending September 10 the maximum temperature was 94, mean maximum 88, minimum 42, and mean minimum 53. There was no precipitation.

In an effort to eliminate, so far as possible, the weed problem on the new station, an apparatus for screening weed seed from the irrigation water has been installed in cooperation with the Division of Seed Investigations of the Bureau of Plant Industry. Cheat grass (Bromus tectorum) is the only troublesome weed on the land of the new station. It occurs everywhere on the uncultivated land as well as on that under irrigation. It is desired to keep out such weeds as sandbur (Cenchrus tribuloides), green foxtail (Chaetochloa viridis), Russian thistle (Salsola pestifer), barnyard or water grass (Echinochloa crus-galli), and crab grass (Syntherisma sanguinale)--all of which are very troublesome weeds on the land that is under cultivation on the project. All manure will be composted for at least a year to rot the seeds.

The device consists of three frames which hold three 2 x 5 foot screens each. The two sets which have been tested have a screen next to the canal with 2 meshes to the inch, while three different meshes of 20, 30, and 40 per inch are available for the inner frame. The screens themselves do not appreciably cut the head of water so long as they are clear, but some difficulty has been encountered with the screens clogging from debris in the water, yet at the same time many weed seeds have accumulated on the screens. The weed seeds found will be reported later as they are analyzed.

The 20-mesh screens do not clog badly enough to cut the head materially in less than four hours. The 40-mesh screens need cleaning every two hours and the 60-mesh more frequently. During one run the 60-mesh screen caused the pump to lose its priming twice. The 2-mesh catches the coarser material and leaves but does not clog badly. It is believed that a set of 10-mesh screens placed between the outer and inner screens would prevent considerable trouble on the finer screen by collecting the material most likely to clog the latter. Clogging has been much worse on windy days on account of leaves blown into the water from an almost continuous windbreak of trees for five miles along the canal. The project water this year has been carrying much more silt than usual, which has been an important factor in retarding the flow of water.

It is recognized that this attempt to remove weed seeds from irrigation water is purely experimental, but it is thought that the mechanical difficultids may be overcome, and if so it will be an important aid in weed control.

H. K. Dean.

Yuma

The milo on the rotation has headed during the week ending September 10 with the exception of two plots that were planted late. Some blasting is showing among the heads of milo. The cause is not fully known, but it may be a result of the high heat and humidity. The humidity was high during last week when many of the milo plants were blooming.

During the month of August the maximum temperature was 112, the minimum 58, the mean 89.2, and the greatest daily range 43. Nineteen days were clear, 11 were partly cloudy, and one was cloudy.

During the week ending September 10 the maximum temperature was 113, the minimum 70, the mean 88.5, and the greatest daily range 50. All the days of the week were clear.

The nine plots from B-9 to B-17 are being fenced for pasture. This area has been in alfalfa for several years and the stand has been about choked out by Bermuda grass. The south four plots have been planted to Sudan grass, which is now between 5 and 6 feet tall. As this area is close to the barn, the cows and mules will be pastured on it. Cross fences are being built to permit the rotation and separation of the cows and mules.

The early dates are ripening and appear to be of good quality. The high humidity probably is speeding up the ripening and helping to produce a better quality in those dates that are permitted to ripen on the tree than would be obtained otherwise.

Station work during the week has consisted of building fence, cultivating the mesquite eradication area, hoeing and cleaning up the garden, and general irrigating.

Max E. Crannell.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV September 17 and 24, 1932 No. 19

Huntley

Conditions were favorable for field work during the two-week period ending September 17. The maximum temperature was 92 and the minimum 34. The precipitation was 0.24 inch.

While cool weather has prevailed, no frost has occurred and late crops are maturing in excellent condition. Sugar beets are making good growth and will probably yield in excess of 14 tons per acre for the entire factory district. The harvest of beets will not begin until October 1, or about two weeks later than usual.

At the station, silage corn was harvested and the third crop of alfalfa was cut.

Station visitors during this time were Professors H. E. Morris and Clyde McKee, of the Montana State College, and J. E. Norton, of the Moccasin station.

Early in the week ending September 24 a light rainfall of 0.23 inch was followed by the first frost of the season. The frost was light and damaged only slightly the more tender crops such as beans and garden truck. The maximum temperature was 84 and the minimum 30.

The harvest of silage corn and the third crop of alfalfa was completed during the week. Other station work included irrigation of stubble lands in preparation for plowing. Sheep and hogs were placed on the corn plots to be pastured in the irrigated rotations.

The maximum yield of oats in the irrigated rotations in 1932 was 119, the minimum was 30.8, and the average was 77.2 bushels per acre. The yields of wheat in the irrigated rotations varied from a maximum of 52.3 to a minimum of 14.3 and with an average of 33 bushels per acre. Flax in the irrigated rotations made a maximum yield of 25.7, a minimum of 4.7, and an average of 15.2 bushels per acre.

The price of Great Northern beans has advanced slightly to $1.50 per hundredweight. There have been some sales at this price, mainly of hold-over beans from the 1931 crop. The bean acreage in the valley was small this year and is just now being threshed.

Prof. Louis Vinke, of the Montana State College, visited the station on September 23.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending September 24 was 85.6, with a maximum of 92 on September 11 and 16; the average minimum was 43.2, with a minimum of 38 on September 19. The mean temperature was 64.4. The average hourly wind movement was 1.205 miles. There was no precipitation.

Newlands (cont'd)

The State of California has recently removed the quarantine on project hay in so far as several of the counties bordering on Nevada are concerned. Several years ago California authorities placed a quarantine on hay produced on the Newlands project because of the presence of the alfalfa weevil. For a time it was unlawful to ship hay or meal through California. Later the quarantine was modified to allow alfalfa meal to be shipped through the State at certain times of the year. Still later modifications allowed shipment of meal into the State at any time. Recently infestations of weevil have been found in counties of California bordering on Nevada, and as a result of this infestation hay can be shipped into several of these counties. It is thought by many that the raising of the quarantine in these California counties will strengthen the market for alfalfa grown on this project.

The work at the station has consisted of one general irrigation, cutting ensilage corn and filling the silo, and general farm repair work. The silo has 40 tons of ensilage stored for winter use. The remaining corn that can not be stored as ensilage will be cut and shocked to be fed later as fodder.

E. W. Knight.

Prosser

The maximum temperature for the week ending September 17 was 88°, the minimum was 40, and the greatest daily range was 42.

The third crop of hay was cut during the week, but owing to the unfavorable drying weather the hay will not be stacked until next week. The last irrigation was applied to the three orchard plots which receive water every 15 days.

Top prices for hogs are now $4.00 a hundredweight and eggs are 19¢ a dozen.

More carloads of mixed fruits, peaches, plums, and prunes were shipped from the Yakima Valley during the week ending September 15 than were shipped at the same time last year. The weekly total for all carloads of produce show that 975 cars were shipped in 1931 and 822 cars in 1932.

The supply of irrigation water in the reservoir amounts to 316,573 acre-feet compared to 51,765 acre-feet held last year at this time. The new canal at Prosser, used to supply water for a power house, is being used steadily now as repairs have been made on that section of the canal which was not concrete lined.

Visitors at the station this week were Dr. N. I. Vavilov, Director of the Institute of Plant Industry of Russia; Dr. E. F. Gaines, Professor of Genetics; and Director E. C. Johnson, of the State College of Washington.

The maximum temperature for the week ending September 24 was 81°, the minimum was 32, and the greatest daily range was 42. A killing frost occurred on September 21. The frost-free period this year was 153 days.

The alfalfa in the basin plots was cut for the third time during the past week.

Two days of the week were spent in the Walla Walla Valley studying water requirement. A considerable portion of the low land along the Walla Walla River in the lower valley was found to be salty due to hard-pan and

Prosser (cont'd)

a high-water table. The major crops in this area are truck crops and alfalfa. Normally, four cuttings of alfalfa are made.

Eggs are now selling at 23¢ a dozen for average large whites. Hops are now bringing 14½ and 15¢ per pound.

During the week ending September 22, 1932, 720 carloads of produce were shipped from the Yakima Valley as compared with 941 carloads for the corresponding period last year.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending September 17 was 83°, with a maximum of 87; the average minimum was 43, with a minimum of 43. No precipitation was recorded.

During the week the third crop of alfalfa was stacked in good condition. The yields for this cutting varied from 0.74 ton per acre to 1.82 tons, with an average of 1.31 tons per acre. The total yield for the three cuttings varied from 2.92 to 5.64 tons per acre, with an average of 4.46 tons per acre. The average yield per rotation varied from 3.01 tons per acre in rotation 65 to 5.15 tons per acre in rotation 61, with an average of 4.42 tons per acre.

Water has been run throughout the week. The potato plots have been irrigated again and both the old and the new seeding on the alfalfa plots are being watered.

The county fair was held during the week and was successful both from an attendance and an exhibit standpoint. The largest attendance at the fair—17,000--was present on the last day. The livestock clubs have again outgrown their quarters and it was necessary to tie some of the stock outside.

The average maximum temperature for the week ending September 24 was 75°, with a maximum of 87; the average minimum was 45, with a minimum of 41. The average wind movement was 6.3 miles per hour. The average daily evaporation was 0.164 inch. No precipitation was recorded.

Water has been run continuously throughout the week. The alfalfa and potato plots and the new seeding of alfalfa in field A have been irrigated. The fencing of sweet clover plots to be pastured in field E was completed, as was the corn plot in rotation 65 that is to be harvested with hogs. The winter wheat plot in field K was irrigated and plowed.

The potato harvest in the valley has begun, and so far the yield and quality have been below normal. However, the potatoes thus far harvested have been the earlier plantings and blight was rather bad among these. The later plantings have not blighted so badly and better yields and quality may be obtained from the later or main crop. The price offered--22¢ per hundred pounds--hardly pays for the cost of harvesting.

The season has been very good for the growth and development of the sugar beet crop. Officials of the Great Western Sugar Company have estimated the yield in the Nebraska district at 14½ tons per acre, which is the highest in their territory. The sugar content is believed to be about normal, possibly not so high as last year, though the weather conditions in the next month may be such that it will continue to increase as it did last year.

Butterfat is now 17¢ a pound and eggs have gained about 2¢ a dozen.

James A. Holden.

Yuma

During the week ending September 17 a part of the sugar beets were planted on A-14-1. The plant selections made during the current season were planted in rows for further study and selection. In the selections made in 1931 there was considerable variation as to type of seed stalk, habit of growth, and size and shape of the beet. It is hoped that selections can be produced which are more uniform and more desirable in seed and sugar production than are the commercial varieties now on the market. In another year there may be enough seed of the best selections to send north to have tested for sugar production.

The summer temperatures have continued with the maximum ranging between 103 and 110. The mean maximum for the week ending September 17 was 107, the mean minimum 68.9, and the greatest daily range 44. No precipitation was recorded. The break in the weather which has been looked for is probably not far in the future as the minimum temperatures have begun to drop. The minimum for the 17th was 60.

Messrs. G. N. Collins and J. H. Kempton, of the Division of Genetics and Biophysics, and C. J. King and Eugene D. Eaton, of the Division of Cotton, Rubber, and Other Tropical Plants, visited the station on September 16.

Station work during the week consisted of finishing the fence on B-9 to 17, planting sugar beets, plowing under hemp on B-2-4, cutting weeds out of irrigation ditches, and general irrigating.

A welcome break in the maximum temperature came during the week ending September 24. The maximum temperature on Tuesday only reached 96, compared to the mean maximum of 107 the preceding week. The temperatures have been climbing up since Tuesday to give a mean maximum of 99.3, a mean minimum of 61.7, and a greatest daily range of 43 for the week.

Planting the lettuce crop has been in progress for the last two weeks. No figures have been reported as to the acreage that will be devoted to this crop. It is probable that a larger acreage will be planted this year than last because of the low prices of alfalfa hay and other principal crops. The Imperial Valley lettuce crop will be up to normal this year as there is no water shortage for the early crop as in 1931.

A tour of cotton growers was conducted to four points of interest in the valley on September 20 and 21. The first day the tour started at Fishbough ranch, where cotton variety tests have been grown by Tom Shawn. From there the tour proceeded to the University of Arizona Experiment Farm where a field of pure Mebane cotton is being grown for the purpose of furnishing the farmers of Yuma County with pure seed. On September 21 the tour came to the U. S. Yuma Field Station to look over the rotations containing cotton. Later the cotton variety cooperative test series, conducted by R. E. Beckett, was studied. The tour on Wednesday was a disappointment as no farmer attended it. A year ago over 20 farmers went on a similar tour. The differences in number of the attendance for the two years may indicate in some measure the interest in cotton.

Station work during the week has consisted of cutting and hauling in the Sudan grass hay on B-14 to 17, cutting sandburs out of alfalfa, cleaning irrigation ditch, general irrigation, picking dates to be tested for curing quality, and cutting sesame.

Max E. Crannell.

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Mr. C. S. Scofield will leave Washington on October 10 for California. Until further notice mail for his attention should be addressed to the Rubidoux Laboratory, Riverside, California.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV October 1 and 8, 1932 No. 20

Huntley

The maximum temperature during the two-week period ending October 8 was 85 and the minimum 25. The precipitation was .57 inch, which occurred on October 7 and stopped field work and delayed the harvest of beets, which was started on October 1.

The potato crop is being harvested and, in most cases, yields are low and the quality poor, particularly in the early plantings. This is due to the prevalence of Rhizoctonia, the development of which was apparently favored by climatic conditions early in the season. The production of potatoes in this locality is not sufficient for local use, and they are being brought in by truck to the Billings market from the Shoshone project in Wyoming. The price here is from 65¢ to 75¢ per hundredweight.

Alfalfa hay is selling at from $4.00 to $4.50 per ton on the farm. Most of the crop will be used locally for feeding lambs and cattle, although there probably will be less feeding done than in former years. The price of feed grains, mainly barley, is 40¢ to 50¢ per hundredweight. Feeder lambs are selling at $4.00 per hundredweight.

A shipment of 300 feeder lambs from the State College at Bozeman was received during this period for use in the cooperative feeding experiment at the station. These lambs will be fed in ten lots of 30 each on various rations, as was done in 1931.

The harvest of potatoes and of the third crop of alfalfa on the station has been completed, and the harvest of beets in the rotations is well under way.

Mr. L. A. Hurst, of the Bureau of Chemistry and Soils, arrived on October 3 for the purpose of harvesting beets in the cooperative fertilizer experiment. Other station visitors were Messrs. R. R. Graves and W. E. Stenhouse, of the Bureau of Dairy Industry.

Yields of alfalfa in the irrigated rotations in 1932

	Tons per acre
First crop	1.38
Second crop	1.55
Third crop	1.33
Average, all three crops	3.98

Yields of alfalfa in the variety test, Field O-III

Average of:	Variety	Total of three cuttings Tons per acre
3 plots	Grimm	6.28
2 "	Ladak	6.07
2 "	Common	5.43
2 "	Cossack	5.51
2 "	Baltic	5.16

Huntley (cont'd)

Potatoes in the irrigated rotations in 1932

	Bushels per acre
Maximum yield	447.0
Minimum "	88.0
Average "	228.4

Dan Hansen.

Newlands

The average maximum temperature for the week ending October 1 was 76.3, with a maximum of 80 on October 1; the average minimum was 42.3, with a minimum of 37 on September 26. The mean temperature was 59.3. The average hourly wind movement was 1.85 miles. There was 0.18 of an inch of precipitation.

The activities at the station were as follows: burning weeds, preparing land for fall sowing, and general repair work. The continued frost-free period has made it possible to postpone the cutting of the alfalfa and fodder corn to a date later than usual. The average date of the first fall frost over a 26-year period has been September 20, but this year there has been no frost although it is now October.

An area in the new K series has been prepared for a fall seeding of winter rye. The plans for this new reclamation area are to sow rye at this time and sweet clover in the early spring. This will enable the good and bad areas to be quickly determined and definite steps towards reclamation undertaken.

The Nevada Agricultural Experiment Station is making further improvements about the dairy barns and corrals. Some new cement floors have been laid and a breeding chute will be constructed in the bull pen. The feeding of ensilage was started on October 1.

The average maximum temperature for the week ending October 8 was 79.3, with a maximum of 85 on October 5; the average minimum was 41.2, with a minimum of 37 on October 8. The mean temperature was 60.3. The average hourly wind movement was 1.24 miles. There was 0.32 of an inch of precipitation.

Stock men are moving beef cattle into the valley for winter feeding; 27 carloads have already arrived. Several hundred tons of hay have been sold for feeding purposes at $5.00 per ton fed. At present labor charges, that means about $4.50 per ton for the hay.

The movement of families from cities to farms has been noticed in this locality. Several former owners have returned to their farms on this project. During years of prosperity they rented or leased their farms and moved to the larger cities of California. The business depression has caused the renters to release their holdings, and in some cases the owners were more than willing to return. A farm at least furnishes food and shelter.

The work at the station has consisted of harvesting the rest of the corn, repairing fences, burning weeds, harvesting apples, and leveling land. Several fills had to be made on the K series prior to planting. In some places areas of two feet or more in depth that were originally filled had settled during the past irrigation season and had to be refilled to obtain good drainage.

E. W. Knight.

Prosser

The maximum temperature for the week ending October 8 was 90°, the minimum was 40, and the greatest daily range was 40.

Water penetration tests on the irrigation plots of the apple orchard were continued during the past week.

At the station 1,339 lambs have been received to be fed during the winter.

During the week 827 carloads of produce were shipped from the Yakima Valley as compared with 815 carloads for the corresponding week last year. This is the first week since July 7 that the 1932 shipments have exceeded those for a similar week in 1931.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending October 1 was 75°, with a maximum of 88; the average minimum was 42, with a minimum of 36. The precipitation amounted to 0.39 inch, making a total of 9.21 inches for the growing season. The average daily evaporation was 0.105 inch. The average wind movement was 3.1 miles per hour.

The past season has been deficient in moisture, the total for the last 23 years being 11.72 inches. However, the water service, with the exception of the first two weeks in August when the canal broke, has been ample. At the end of the month when the water was shut off, the storage in the Pathfinder and the Guernsey reservoirs was about 213,000 acre-feet. The temperature for the month has been above normal, the average mean being 59.5°.

Water has been run continuously throughout the week and all of the crops have been thoroughly irrigated. There is a good stand on all the new seeding of alfalfa, which will go into the winter with a good growth and plenty of moisture. The sweet clover pastures in field E have been fenced and sheep turned in to utilize the last of the pasture.

The labor at the station has been reduced to the winter basis, as all of the crops have been harvested except potatoes and beets and these will be handled with special crews.

Hogs have lost about 15¢ per hundred during the week, but eggs have increased about 4¢ per dozen and are now selling at 20¢.

The Great Western Sugar Company has issued orders to growers to begin the beet harvest on October 5.

The average maximum temperature for the week ending October 8 was 60°, with a maximum of 82; the average minimum was 33, with a minimum of 20. The precipitation for the week amounted to 0.22 inch, making a total of 10.21 inches for the year. The average wind movement was 7.8 miles per hour.

The first frost of the season came on the night of the 4th following a rain of 0.09 inch during the day. The thermometer dropped to 20°, and the frost killed all vegetation. Harvesting the potatoes on the Walker place was commenced on the 5th as the temperature returned to normal. The harvest was delayed on the 8th: a rain commencing on the night of the 7th turned to snow on the 8th, but it was not accompanied by a drop in temperature, and no damage was done to the potatoes remaining in the ground.

Throughout the valley the potato harvest is about 80 per cent fin-

Scotts Bluff (cont'd)

ished. Of the 20 per cent remaining in the ground a considerable acreage will not be harvested because the price received for a low yield would not pay the expenses of digging. Thirty cents per hundred is the highest price that has so far been offered, and there are not many buyers.

Beet harvest commenced on the 5th and most of the factories in the valley commenced slicing on the 6th, all of them being in operation by the 8th.

Eggs took a sudden upturn and were selling at 27¢ per dozen at the end of the week. This makes the poultry business quite profitable as the price of feed remains very low.

James A. Holden.

Umatilla

During the week ending October 8 the maximum temperature was 85 and the minimum was 39. There was no precipitation and no appreciable wind.

Work was continued grading the plot land, the second series being completed. Construction of garage and machine shed addition was begun during the week. The contractor who is moving the office building from the old station to the new site began work. This building will be used to store feed and seed.

There is an outbreak of chicken-pox in the station's turkey flock. While there has been some chicken-pox on the project from time to time, this is the first outbreak on the station since the turkey work was started. The disease is much more prevalent this year than previously. It is thought that birds carried the disease as the turkeys are under strict confinement and no one except the caretaker is allowed in the lots. Vaccine was obtained and administered as soon as possible.

Mr. A. F. Sievers, of the Division of Drug and Related Plants, visited the station on October 2 and 3. He was especially interested in the progress being made with the planting of Pyrethrum plants, and plans were made for an extension of the trials next year.

H. K. Dean.

Yuma

The maximum temperature for the week ending October 1 was 100, minimum 54, mean 82.8, and greatest daily range 41. There was a trace of precipitation.

For the month of September the maximum temperature was 113, minimum 54, and mean 82.5. There was a trace of precipitation. The relative humidity for the month has been very high. Rain-storms have occurred in all of the surrounding mountainous areas, but no precipitation of any consequence fell on the project. The weather as a whole has been very favorable for the harvesting of the second crop of alfalfa seed and the picking of cotton.

The ginning of cotton is well under way; about 3500 bales have been ginned to date. To handle the cotton crop in previous seasons 13 gins were in operation at various points on the project. This year, however, only six gins are operating. The reduction in the cotton acreage and the difficulty in getting financial aid have centered all ginning operations in the hands of two companies. The Anderson Clayton Company is operating four gins and the Pacific Cotton Seed Products Corporation two plants. Growers are paying 40 to 50 cents per hundred pounds for picking. Lint prices locally

Yuma (cont'd)

are close to eastern spot quotations. Contracts for future delivery were made in August for the disposal of about 1200 bales at .0875¢ a pound. The yield and quality of cotton for 1932 will be much better than for last year. The high humidity that prevailed during most of September will reduce the yields which were indicated earlier in the season, but as a whole the crop looks good.

The flow of the Colorado River has reached its normal low stage for this season of the year. The present discharge is reported to be about 2,000 second-feet at Yuma.

Station work during the week included the mowing of alfalfa plots on the rotations, harvesting the broadcast and row plantings of sesame, releveling fallow fields, harvesting dates, cleaning and repairing irrigation ditches, and general irrigating and cultivating.

The picking of Pima cotton in the rotations will be started next week. The bottom crop on these plots seems to have set very well, but the bolls are small and under-developed. This set of bolls extends well up into the middle of the plant. This condition together with the indications of caterpillar injury will reduce our anticipated yields. The effects of nematode injury in the infested areas are very apparent this year.

E. G. Noble.

M I S C E L L A N E O U S

Mr. S. H. Hastings, Principal Agronomist, left Washington on October 11 for a trip to the Southwest. His itinerary includes San Antonio, Texas; State College, New Mexico; Tucson and Sacaton, Arizona; and Bard and Riverside, California.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV October 15 and 22, 1932 No. 21

Belle Fourche

For the week ending October 8 the maximum temperature was 80 and the minimum 24. The precipitation was .63 inch.

Station work during the week consisted of hauling hay to feeder lambs, building feed lots, weighing and grading lambs.

For the lamb-feeding experiment 750 range lambs were divided into seven lots of 100 each. The lambs were ear-tagged, individually weighed, and graded. The following rations will be used:

Lot 1. Shelled corn, alfalfa hay.
Lot 2. Barley, alfalfa screenings, pressed pulp, alfalfa hay.
Lot 3. Barley, pressed pulp, alfalfa hay.
Lot 4. Oats, pressed pulp, alfalfa hay.
Lot 5. Wheat, pressed pulp, alfalfa hay.
Lot 6. Wheat, oats (equal parts by weight), pressed pulp, beet tops, alfalfa hay.
Lot 7. Shelled corn, pressed pulp, alfalfa hay.

Mr. Baker and Mr. Smith, of the U. S. Range Livestock Station, Miles City, Montana, visited the station October 4 to 8 and assisted in the grading of the feeder lambs.

During the week ending October 15 the maximum temperature was 77 and the minimum 11. The precipitation was .36 inch.

On account of the snow-storm on October 8 and 9 very little field work could be done the first part of the week. Some of the potatoes were harvested toward the end of the week. The potato yields will be below average, probably due to blight. Three applications of bordeaux mixture was applied during the summer, but in spite of this the disease was not effectively controlled.

For the week ending October 22 the maximum temperature was 70 and the minimum 23. The precipitation was .39 inch.

On account of weather conditions no field work could be done during the week. On Monday and Tuesday, sugar beet samples were taken from beet plots in the irrigated rotations. Ten samples of 10 beets each were taken from each plot. The sugar content ranges from 15.9 per cent to 18.0 per cent, with purity 84.6 to 88.2 per cent. Due to replanting, which was done on June 5, the yields of beets will be rather light. On October 19 one of the worst snow-storms on record occurred. About 8 inches of snow fell accompanied by a terriffic wind-storm. The feed lots drifted full of snow, and it required the entire labor force the rest of the week to get them cleaned up.

There were no serious losses of stock as the storm lasted only one day and the temperature went down only to 15°. It warmed up after the storm so by the end of the week most of the snow was gone and field work can be continued.

Beyer Aune

Newlands

During the week ending October 15 the average maximum temperature was 74.2, with a maximum of 78 on October 13; the average minimum was 32.4, with a minimum of 30 on October 10 and 13. The mean temperature was 53.3. The average hourly wind movement was 1.11 miles. There was no precipitation.

The frost-free period this year extended from April 28 to October 10, a total of 164 days. This is the longest period without frost that has been recorded at this station during 27 years of weather observations. It was 40 days longer than the average.

The people on the project are very much interested in the coming election and are giving a great deal more attention to local politics than in former years. A group of project farmers have organized for reduction in farm taxes and have nominated candidates for local offices.

The work at the station has consisted of seeding the K series to winter rye and harvesting the rest of the corn crop. The yields of ensilage corn as green fodder from the various plots ranged from a maximum of 20,478 to a minimum of 633 pounds per acre, with an average of 9,235.8 pounds.

The average maximum temperature for the week ending October 22 was 59.9, with a maximum of 76 on October 22; the average minimum was 27.2, with a minimum of 20 on October 21. The mean temperature was 43.5. The average hourly wind movement was 2.54 miles. There was no precipitation.

The work at the station has consisted of harvesting the third crop of hay. The yields of hay this year were less than in former years due to a heavy infestation of alfalfa weevil that resulted in an average loss of a half ton or more to the acre. The total yields of alfalfa per acre for all three cuttings ranged from a maximum of 5.28 tons to a minimum of 2.12 tons. The average yield was 3.62 tons per acre.

E. W. Knight.

Prosser

The maximum temperature for the week ending October 15 was 69°, the minimum was 38°, and the greatest daily range was 24°. A total of .88 of an inch of rain fell during the week.

The corn irrigation plots were harvested during the week.

Prices to producers are now $3.75 for hogs and $4.75 for prime steers. Large white eggs are selling for 28 cents per dozen. Butterfat is now being quoted at 18 to 19 cents per pound. The grower is now receiving $8.00 to $9.00 per ton for U. S. No. 1 potatoes.

Fewer vegetables were shipped from the Yakima Valley during the past week, but more apples, grapes, pears, and peaches were shipped than in the corresponding week last year.

The maximum temperature for the week ending October 22 was 73°, the minimum was 30, and the greatest daily range was also 30°. There were two heavy frosts during the week.

The headgates of the Sunnyside Canal were closed on October 21, which definitely ended the irrigation season. There is 242,558 acre-feet of water held in storage at the present time. During the latter part of this week the storage has been increased a few thousand acre-feet by rains in the mountains.

Prosser (cont'd)

Irrigation data was arranged and calculated during the week. The irrigation plots in potatoes will be harvested next week.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending October 15 was 67, with a maximum of 81; the average minimum was 35, with a minimum of 19. No precipitation was recorded at the station. The average wind movement was 4.1 miles per hour.

The week has been ideal for farm work. At the station the harvesting of potatoes was completed. During the week another hard freeze occurred and the potatoes that were still in the ground were damaged considerably. The yield of potatoes on the station was fairly good and the quality was fair. The stand was above the average, but the yield was not in proportion. Probably the shortage of water during the first half of August, caused by the break in the canal, affected the yield more than was thought.

Beet harvest has gone ahead with great rapidity, and a greater percentage of the beets have been harvested at this time than is usual. Sugar Company officials estimate that the tonnage this year will be heavy, but the sugar content will be only about the average and will be less than it was last year. It is reported that on last year's contract an additional payment will be made to growers whose beets averaged in sugar content 17 per cent or more.

Feeder lambs are coming in earlier this year than last, but it is thought that fewer lambs will be on feed. The estimate for this year is from 350,000 to 400,000 as compared with 415,000 last year. A full trainload of lambs was received at Mitchell the last of the week. The price is ranging from 3½¢ to 4½¢ per pound.

The weekly auctions of livestock held at Scottsbluff have been of great benefit to livestock men in the valley. The station had a truckload of hogs on the market this week that brought $3.15 per hundred pounds, which was within 20¢ of the Omaha market for that day for hogs of the same weight. There has been a sharp advance in the price of eggs, which are now selling for 27¢ to 30¢ a dozen. The income from the poultry flock is now becoming one of the greatest assets of the farm in this valley.

The average maximum temperature for the week ending October 22 was 54, with a maximum of 86; the average minimum was 29, with a minimum of 13. The precipitation amounted to 0.21 inch, making a total of 10.42 inches. The average hourly wind movement was 7.7 miles.

The harvest of beets has progressed steadily and at the end of the week was about 45 per cent completed. A 2-inch snow fell on the 18th, but there was no fall in temperature accompanying it, and only one day was lost in the beet harvest.

Yields of potatoes: In field K the yield varied from 72.7 bushels per acre in rotation 4 to 323.3 bushels in rotation 61, with an average yield of 203.7 bushels. The average from the alfalfa plots was 221.7 bushels; from the alfalfa and manured plots, 312 bushels; from the manured plots, 266.5 bushels; and from the untreated plots the average was 114.8 bushels. In field E, in which sweet clover is used in the rotation, the yield varied from 171.3 bushels in rotation 33 to 382.6 bushels in rota-

Scotts Bluff (cont'd)

tion 47, with an average of 268.7 bushels. The two plots in the maximum yield series, begun this year, yielded 469.3 and 394.6 bushels per acre. The average per cent of culls was high, being 31 per cent in field K and 20 per cent in field E.

James A. Holden.

Umatilla

During the week ending October 15 the maximum temperature was 76 and the minimum was 35. The precipitation was .35 inch. This was the first rain to amount to anything since the latter part of May.

The work of grading is progressing more rapidly since the rain, and the rye from the straw is beginning to grow so that future winds should not do much if any damage.

The construction of the garage and machine shed addition is progressing rapidly and should be completed by the end of next week.

A. T. Mitchelson and M. R. Lewis, of the Bureau of Agricultural Engineering, visited the station to look over the land on which it is proposed to conduct irrigation experiments. Mr. Lewis also gave assistance in planning the turnout from the feed canal.

H. K. Dean.

Yuma

For the two-week period ending October 15 the maximum temperature was 101, mean maximum 94.1, minimum 53, mean minimum 61.5, and the greatest daily range 45. The relative humidity has continued to be high, in fact so high that the dew does not evaporate in the shade during the day.

The valley received several hard rains on the 9th and 10th. At the station the precipitation amounted to 2.85 inches, while the Weather Bureau at Yuma reported 3.39 inches. This is more than the average annual rainfall in this section. The rain did considerable damage to lettuce, cotton, and the second crop of alfalfa seed. It is hard to estimate the damage to the cotton; that on the ground is a total loss. The plants have leaned over badly, which will make them hard to pick. It was very fortunate that most of the short staple had been picked for the first time. The station was ready to start picking when the storm came.

It was reported that more water came down the mountain washes northwest of Bard than at any time since the project was started. This water broke through the retention levee in seven places and caused considerable damage to the main canal, which carries water to the Arizona side of the project. The canal was not broken, and repairs were started as soon as possible.

The rain caused damage to some varieties of the dates. The loss was not so large as it would have been if the rain had come in September when higher temperatures prevail. The effect of the rain on the dates at the station is being recorded.

Messrs. T. H. Kearney, G. J. Harrison, and J. S. Townsend visited the station on October 8 and 9 in regard to the cotton work being carried on in this section. Mr. R. W. Nixon was at the station on October 8 examining the most promising dates.

Yuma (cont'd)

The station work during the two-week period has consisted of cleaning up the tool house, moving cotton seed, mowing and raking the yards, cutting wood, cutting alfalfa hay on the rotation, cutting weeds on the rotations and ditch banks, repairing ditches and gates, general irrigating, and picking and curing the most promising dates.

Max E. Crannell.

M I S C E L L A N E O U S

Annual Roll Call - American Red Cross

The annual membership roll call of the American Red Cross will take place during the period from November 11 to 26. The facilities of this splendid organization are being utilized to relieve distress throughout the country on a scale never previously attempted.

To continue this work and to provide for the regular activities of disaster relief, assistance to service men and veterans, public health nursing, etc., requires the support of all our people. The employees of the Department of Agriculture have always responded generously to such appeals, and I urge them to give increased support to this most urgent plea.

(Signed) Arthur M. Hyde
Secretary.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV October 29 and November 5, 1932 No. 22

Belle Fourche

During the week ending November 5 the maximum temperature was 56 and the minimum 21. The precipitation was .01 inch.

The harvesting of sugar beets was completed during the week. On November 1 all the dumps were closed temporarily on account of frozen beets so that these beets could be milled out, as they were not fit to go in the storage piles. The harvesting was continued, and the beets were put into piles and covered. It is expected that the beet dumps will be opened the first of the week.

The feeder lambs were weighed after the first 30-day period. The average daily gain for all the lots was .185 pound, with very little variation between the different lots. The average daily gain is rather low, but the weather during October was very unfavorable for feeding all kinds of stock.

Beyer Aune.

Huntley

The maximum temperature during the week ending October 22 was 62 and the minimum 12. The precipitation was .82 inch. The precipitation, in the form of snow, came early in the week.

The snow stopped all field work, and no beets were delivered until Saturday. The beet harvest throughout this district is about 40 per cent complete. Yields appear to be higher than was at first estimated; the average for the district will probably be near 15 tons per acre. The sugar content is also high, the average of 100 samples analyzed from the station plots being about 17 per cent. The harvest of beets at the station was completed on October 15. The yields varied from a minimum of 6.08 to a maximum of 24.32 tons per acre. The average yield per acre was 14.96 tons.

The lamb-feeding experiment, cooperative with the Montana Agricultural Experiment Station, was begun on October 14. The lambs, 300 in number, were furnished from the State College flock at Bozeman. They are good range lambs of Rambouillet breeding and averaged about 65 pounds in weight at the beginning of the test. They have been divided into 10 lots of 30 lambs each. The rations fed are the same as in 1931.

More than the usual number of lambs are being fed on the project this season. Many feeders are feeding under contract in which the lambs are taken into the feed lots at $4.00 per hundredweight and turned back to the contractor at the end of the 100-day feeding period at $5.00 per hundredweight. The prices of feeds are as follows: alfalfa, $4.00 to $4.50 per ton; barley and soft wheat, 50¢ per hundredweight; and wet beet pulp, 40¢ per ton.

During the week ending November 5 the maximum temperature was 55 and the minimum 5. The precipitation, occurring in the form of a light

Huntley (cont'd)

snow on October 30, was .20 inch. It interfered with field work early in the week, but conditions were again favorable during the latter part of the week.

The harvest of sugar beets in the valley is going on at a rapid rate and is nearing completion. Many farmers are piling beets in the field in large piles without topping in order to have time to get all of the beets out of the ground before freezing weather begins. The average yield will probably exceed the pre-harvest estimate of 14 tons per acre. Many fields are yielding in excess of 20 tons.

Work at the station included hauling manure and plowing. Plowing of the plots in the rotation fields will soon be completed.

Conditions for feeding have been favorable, and lambs in the feeding experiment are making good gains.

Dan Hansen.

Newlands

The average maximum temperature for the week ending October 29 was 63, with a maximum of 75 on October 28; the average minimum was 25.2, with a minimum of 18 on October 25. The mean temperature was 44.1. The average hourly wind movement was 2.14 miles. There was no precipitation.

At the station the general fall work has been carried on. Ditches have been cleaned of weeds, some plots have been disked, and others are being releveled.

The K series has a fair stand of winter rye. It is hoped that the growth of this crop will be sufficient to indicate the productive and unproductive areas. It is planned to take soil samples from these areas in order that the effect of the reclamation feature may be studied as the experiment progresses. If the growth of this crop is sufficient this fall, soil samples will be taken before freezing weather begins. Otherwise the sampling will be done early in the spring. The winter cover crop will also be used early next spring as a nurse crop for a seeding of sweet clover.

The tractor is being overhauled in preparation for the continuance of the land leveling plans of last winter. In one more winter all the leveling that has been planned should be completed. As a result of this work about 20 acres of new land will be put under cultivation.

The average maximum temperature for the week ending November 5 was 61.7, with a maximum of 72 on November 1; the average minimum was 24.4, with a minimum of 16 on November 4. The mean temperature was 43.1. The average hourly wind movement was 2.85 miles. There was no precipitation.

During this period all field employees were engaged in hauling dirt to fill in the settled spots in the area that was leveled last winter. In some places the soil during the periods of irrigation gradually settled, making areas that did not drain properly. It is to correct this condition that the present work is being done.

The last irrigation for the fall was given to all plots on November 2 and 3. It is hoped that all the fall-seeded rye and summer-planted alfalfa will have sufficient moisture to carry them through the winter. The spring plantings in the orchard were given a late irrigation.

E. W. Knight.

Prosser

The maximum temperature for the week ending October 29 was 67, the minimum was 28, and the greatest daily range was 29°. A trace of rain fell the first of the week. Three heavy frosts occurred at the station.

Farm work consisted of digging the potato borders around the plots in preparation for using the machine digger.

Prices received by farmers for their produce remained steady throughout the week.

The maximum temperature for the week ending November 5 was 62 and the minimum was 34. The rainfall amounted to .09 inch.

During the past season 2.9 acre-feet of water was delivered to the station. This is one-tenth of an acre-foot short of the allowance.

The yields of alfalfa hay from five irrigation plots for the past season are shown in the following table:

Plot	Ac.-in. applied	Run-off % (Est.)	Available in soil* April 1	Available in soil* Sept. 15	Weight of air-dry hay (tons) First cutting	Second cutting	Third cutting	Total	Acre-inches water used
			Ac.in.	Ac.in.					
1	64.35	20	9.94	13.68	2.25	1.88	1.80	5.93	47.66
2	49.1	15	7.23	11.79	2.38	2.16	1.87	6.41	37.14
3	38.4	12	8.96	6.12	2.32	2.15	1.84	6.31	36.64
4	34.2	11	6.19	2.76	2.32	2.02	1.65	5.99	33.83
5	24.06	10	3.04	.06	2.17	1.44	1.02	4.53	24.64

Five irrigations were applied at approximately 30-day intervals.
* Acre-inches exceeding 6 acre-inches in 6 feet of soil.

The highest yield was obtained from the plot receiving 37 acre-inches in five irrigations and the lowest yield was obtained from a plot receiving 24.6 acre-inches in five irrigations.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending October 29 was 51°, with a maximum of 69; the average minimum was 16, with a minimum of 13. During the week .09 inch of moisture was recorded from two light showers. The total precipitation for the year has been 10.51 inches. The average hourly wind movement was 10.5 miles during the week.

The beet harvest was delayed only one day during the week on account of weather conditions. In the Nebraska district about 80 per cent of the beets are harvested.

At the station the entire week was spent in harvesting beets. All of field K and all but 5 plots in field E have been harvested. The yields will average a little more than last year. The sugar content is low, the analysis from the sugar company showing a variation of from 11.4 to 15.7 per cent. Samples were taken from each plot and will be analyzed by S. B. Nuckols, of the Division of Sugar Plant Investigations. These data will not be available for some time, and until we get the weights of the samples the actual yield per plot can not be determined.

Prices of all farm products, except eggs, have declined during the week. Butterfat is selling for 15¢ a pound.

A change in the management of the Cooperative Cheese Company has

Scotts Bluff (cont'd)

been announced. Eben D. Warner, former manager, has resigned and Chas. M. Kearney, a dairyman from Morrill, Nebr., has accepted the position. An additional loan from the Farm Board has been obtained.

The average maximum temperature for the week ending November 5 was 56°, with a maximum of 66; the average minimum was 26, with a minimum of 14. No precipitation was recorded. The average wind movement was 7.4 miles per hour.

The month of October was below the normal in temperature and moisture. The average maximum was 59° as compared with a 22-year average of 62; the average minimum was 31°, while the average for the same period is 33. The monthly precipitation was .45 inch as compared with an average for the 22 years of 1.05 inches.

During the week the harvest of beets at the station was finished. At the end of the harvest the sugar content as determined by the Sugar Company was a little higher than at the beginning.

In the valley the beet harvest is practically completed. The season will be considerably shorter than usual owing to the fact that the factories are setting new records this year in slicing. The Scottsbluff factory, with a rated capacity of 2500 tons per day, has been slicing from 3200 to 3400 tons per day. The other factories in the valley have been making about the same increase.

The Great Western Sugar Company has also lowered the price of molasses-dried pulp, effective November 1, to $10 per ton in bulk at the warehouse and $13 per ton in 100-pound bags. The former price was $12 and $15 per ton. This puts the price of dried pulp down almost to the price of corn. Corn is now quoted in carload lots at from $9.00 to $9.40 per ton, with barley a little lower than corn.

Feeder lambs are coming in more slowly now in the hope that prices will be a little lower. A few calves have been shipped in.

Mr. W. W. McLaughlin, of the Bureau of Agricultural Engineering, was at the station the latter part of the week for a conference with Lester Bowen, who is in charge of the soil moisture investigations being carried on at this station.

James A. Holden.

MISCELLANEOUS

A "List of Publications Relating to the Activities of the Division of Western Irrigation Agriculture," covering the years from 1900 to the present time and embracing 232 titles, has been prepared and mimeographed. A copy is being sent to each of our field stations and laboratories and a limited supply maintained for distribution. It is proposed to add to this list from time to time, including those publications that have subsequently been issued.

A paper by Mr. C. S. Scofield, entitled "Stream Pollution by Irrigation Residues," was published in the November 1932 issue of INDUSTRIAL AND ENGINEERING CHEMISTRY.

Mr. S. H. Hastings has returned to Washington from a field trip to the Southwest.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV November 12 and 19, 1932 No. 23

Belle Fourche

For the week ending November 12 the maximum temperature was 57 and the minimum 16. There was a trace of precipitation.

Mr. E. S. Lyons, of the Bureau of Chemistry and Soils, harvested the fertilizer beets at the station on November 8 and 9. These beets were grown in field G on land that was in sweet clover pasture in 1931. The land was fall-plowed and in the spring was double-disked and duck-footed. The beets were first planted on May 14 in four replicated 1/50th acre plots. On May 30 a heavy rain washed the ground so badly that they had to be replanted. Due to the wet condition of the ground and frequent showers, the replanting could not be done until June 14. The beets were up on June 28, were thinned July 9, were cultivated three times, were hoed two times, were irrigated six times, and were harvested on November 8 and 9.

During the week ending November 19 the maximum temperature was 57 and the minimum 7. The precipitation was .07 inch.

During the week most of the field work was finished, such as husking corn, hauling beets, and plowing. Part of the time was spent in laying tile drain in field A, south end, series I.

The beet harvest was practically finished in the district during the week. Due to a large amount of frozen beets, the delivery at the different dumps has been limited to the grinding capacity of the factory. For this reason there is still a considerable tonnage of beets to be hauled. A payment of $4.25 per ton was made on November 19 for beets delivered in October. This is estimated as a 90 per cent payment at this time.

On the station the mean yields from the quadruplicated planting of sugar beets ranged from a maximum of 13.32 tons from the plots having the 0 - 20 - 0 treatment of 500 pounds of fertilizer per acre to a minimum of 12.29 tons per acre from the check plots. The mean per cent of sugar was 18.3 with no significant variations that could be attributed to the different fertilizer treatments.

Beyer Aune.

Huntley

Conditions were favorable for outside work during most of the week ending November 12. The maximum temperature was 48 and the minimum 8. The precipitation was .30 inch.

The harvest of sugar beets in this section is nearing completion. The initial payment of $4.50 per ton for beets delivered before November 1, which will be made on November 15, will amount to about $1,300,000. This payment is for about 70 per cent of the crop. It is expected that

Huntley (cont'd)

additional payments will be made during the next year, the amount of such payments depending upon the selling price of sugar manufactured from this year's crop of beets.

Station work included fall plowing and hauling in corn.

Mr. Geo. W. Morgan, of the Havre station, was a visitor on November 12.

Local prices of farm products continue as follows: Alfalfa hay, $4.00 to $4.50 per ton; butterfat, 16¢ per pound; feed grains, 50¢ per hundredweight; and eggs, 30¢ per dozen.

Dan Hansen.

Prosser

The maximum temperature for the week ending November 12 was 60, the minimum 26, and the greatest daily range was 27°. The rainfall amounted to .39 of an inch.

The potato plots were harvested the first of last week, but as yet have not been sorted.

The market has been steady during the week. Hops advanced 3¢ per pound and are now quoted at 18 and 19¢ per pound. The hop growers feel confident that they will be able to obtain a higher price for their hops, and it has been reported that some growers are holding their hops for 25¢ per pound. Butterfat is now selling for 19 and 20¢ per pound.

The maximum temperature for the week ending November 19 was 71, the minimum was 32, and the greatest daily range was 28°. The rainfall amounted to .37 of an inch. Heavy rainfall in the mountains has caused the Yakima River to rise rapidly.

Approximately 375,000 acre-feet of water is held in storage at the present time.

The annual meeting of the Washington Irrigation Institute was held at Sunnyside, Washington, on the 18th and 19th of November. Many problems of irrigated districts were discussed.

The price of hops has advanced to 25¢ a pound, making an increase of 5¢ a pound this week. Barley prices advanced 50¢ per ton and are now $13 per ton. Producers are realizing 17 and 18¢ a pound for dressed turkeys.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending November 12 was 44, with a maximum of 67; the average minimum was 23, with a minimum of 15. During the week there was a 2-inch snow with a measured precipitation of .17 inch, making a total for the year of 10.68 inches. The wind movement was 12.8 miles per hour, a rather unusual amount of wind for this time of the year.

The beet harvest is practically completed. Many of the dumps have been closed and the piled beets have been delivered. The first payment has been announced and is as follows: With a sugar content up to 14%, $3.50; 14.1 to 15%, $3.75; 15.1 to 16%, $4.00; 16.1 to 17%, $4.25; and 17.1% or more, $4.50. The Holly Sugar Company, operating in the western part of the project in Wyoming, will make a flat payment of $4.00 per ton. The sugar content of the beets in Nebraska (the Great Western territory)

Scotts Bluff (cont'd)

has not been announced as yet, but it will be considerably lower than last year.

During the week the beans were threshed, and the yields were as follows: Rotation 11, 14.5 bushels per acre; rotation 12, 17.7 bushels; rotation 49, 22 bushels; maximum yield plot, 35.5 bushels, the variety being the Great Northern.

The average maximum temperature for the week ending November 19 was 51, with a maximum of 68; the average minimum was 24, with a minimum of 16. The only precipitation was about half an inch of snow with a measured precipitation of .04 inch, making a total for the year of 10.72 inches. The wind movement was 9 miles per hour.

The first payment for beets was made during the week. About 70 per cent of the growers in the Nebraska district received an initial payment of $4.00 per ton. All of the beets are now in.

The yields of beets at the station varied from a minimum of 6.37 to a maximum of 23.64 tons per acre, with an average of 14.82 tons per acre for all the plots. No report has been received as yet on the sugar analysis of the individual plots. According to the Sugar Company's tests, the sugar content of the beets delivered in October ranged from 11.8 to 15.8% with an average of 14.4%.

During the week 360 lambs were received from Denver and will be put on test. They will be divided into 13 lots, and will be fed the same ration that has been used during the last two fall feeding periods, in which wheat is fed in combination with other home-grown grains. The lambs averaged 50 pounds each in Denver and will be fed about 120 days.

Butterfat has advanced 2¢ and is now selling at 17¢ for sour cream and 19¢ for sweet cream. The local livestock markets have been able to get Omaha prices for well-finished hogs. The station marketed a truck load of 275-pound hogs at the end of the week at $3.25 per cwt., which was 5¢ above the Omaha market on that day.

James A. Holden.

Umatilla

Report for the four-week period ending November 12.

The first killing frost on the new station site was recorded October 23 when the minimum was 30°. The temperature on that date at the district headquarters in town was 23. The first killing frost on the lower ground of the old station site was on October 9. The minimum temperature for the period was 28 on November 10 and the maximum 74 on October 21.

The garage and machine shed additions were completed with the exception of the third coat of paint on October 29. Rain and wind have thus far prevented completion of the painting. The contractor finished moving and assembling the old office building on October 28.

Straw has been cut from all of the land which last winter grew rye, and the same area has been reseeded with rye. The fall weather has been so windy and dry that the cover crops are just emerging. It is believed that there is enough stubble and trash on the ground to prevent any serious blowing.

The grading, strawing, and seeding with rye of the third series of plots was completed. This includes 20 acres or half of the plot land which it is contemplated to develop at this time. Work on the remainder

Umatilla (cont'd)

will be continued during the winter as the weather permits.

The turkeys in the Thanksgiving turkey pool were received on November 10-- 3800, weighing 58,000 pounds, were shipped. The turkeys graded in excess of 80 per cent prime, which is exceptionally good for the early pool. One car of prime toms was shipped to New York. The association advanced 10 cents on primes, 8 cents on choice, and 5 cents on commercials. Another 2 cents a pound is to be advanced when the manifests are received by the association bank.

H. K. Dean.

M I S C E L L A N E O U S

A paper entitled "Boron Requirements of Cotton," by Frank M. Eaton, was published in the October 1932 issue of SOIL SCIENCE.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV November 26 and December 3, 1932 No. 24

Huntley

The maximum temperature during the week ending November 26 was 60 and the minimum was 16. There was no precipitation.

The delivery of sugar beets to receiving stations was completed during the week, and a start was made in loading storage piles of beets at these stations.

With conditions continuing favorable, many farmers are making good progress in field work and more than the usual amount of fall plowing is being done.

Mid-season weights of lambs in the feeding experiment indicate that the lambs are making very satisfactory gains in most of the lots. Lambs fed a ration of alfalfa, barley, beet pulp, and cottonseed cake made an average daily gain of .42 pound per day, which was the highest gain made by any of the lots during the first 42 days of the experiment. The lot making the lowest gain, which was at the rate of .22 pound per day, is being fed alfalfa hay and barley.

Station work during the week included husking corn and plowing.

Mr. W. F. Dickson, of the Montana Experiment Station, was a visitor on November 26.

Dan Hansen.

Newlands

The average maximum temperature for the three-week period ending November 26 was 61.2, with a maximum of 70 on November 13, 20, and 21; the average minimum was 24.8, with a minimum of 16 on November 11. The mean temperature was 43.0. The average hourly wind movement was 1.61 miles. There was no precipitation.

The mild weather prevailing this fall has been ideal for tractor work. After spending several days in repairing the McCormack-Deering tractor, work was started leveling land. There are six acres of the originally planned job that remain to be leveled. This work, which should be finished by early spring, will result in a great improvement in the slope and arrangement of the farmed area of the station and will add some 20 acres to the land under cultivation. This work was started three years ago. During the summer months all leveling ceases, as the other station work requires all the available help during the growing season. Therefore, the leveling on this station is done during that part of the year when work is slack. Of course more is accomplished during warm weather and open winters than when the weather is severe.

Butterfat is now selling at 31¢ a pound and eggs are bringing 35½¢ a dozen. The Thanksgiving pool prices were 23¢ for prime turkeys and 21¢ for choice.

The average maximum temperature for the week ending December 3 was 60, with a maximum of 68 on November 29 and 30; the average minimum

Newlands (cont'd)

was 25.3, with a minimum of 17 on December 1 and 2. The mean temperature was 42.6. The average hourly wind movement was 2.64 miles. There was a trace of precipitation.

It has been estimated that the continued advance in butterfat prices has resulted in the payment of an additional $250 a day to project farmers. If the banks were open, conditions here would be greatly improved. The failure of twelve banks in the State, one being the only bank in Fallon, has added a further burden to the troubles of the local farmers and merchants.

The usual fall work at the station is being continued. Land leveling is still progressing, and some of the men are engaged in plowing and hauling manure.

E. J. Knight.

Prosser

The maximum temperature for the week ending November 26 was 60, the minimum was 33, and the greatest daily range was 26°.

The new power plant at Prosser has been operating continuously for the past two months and is generating 3000 kilowatts. The canal carrying water to the power house still leaks in places that were not concrete lined, but these sections are being enforced with soil in an attempt to stop the leaks.

Hops are now selling for 27¢ a pound, although growers are reluctant to sell at this price. Butterfat also advanced to 27 cents a pound, making a gain of 4¢ a pound during the week.

Fifty-six more carloads of produce were shipped from the Yakima Valley the week ending November 24 this year than were shipped during the same week last year. The greatest gain of any one commodity was that of apples.

The maximum temperature for the week ending December 3 was 62, the minimum was 28, and the greatest daily range was 25.° Rainfall amounted to .15 of an inch and came in two showers the first part of the week.

The Washington Horticultural Association held its annual meeting at Wenatchee November 30 to December 3. A number of papers were presented that were of interest to the orchardist. The growers seemed to be more interested in the price of produce and financial aid than in production problems this year.

The market for farm produce in the valley has been steady during the week. The only commodity that has increased in price is potatoes, which advanced 50¢ per ton and are now quoted at $8.50 to $9.50 per ton to the grower.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending November 26 was 61, with a maximum of 66; the average minimum was 26, with a minimum of 12. No precipitation was recorded. The average wind movement was 6.1 miles per hour.

At the station nothing but the routine work has been carried on.

The county surveyor and the county commissioner for this district have been doing the necessary preliminary work on the road along the south

Scotts Bluff (cont'd)

side of the station. It will be widened and the grade will be raised several feet in order to overcome, to a great extent at least, the drifting of snow along this section. The Pathfinder Irrigation District is assisting in this plan by eliminating a high-fill lateral at the southeast corner of the station.

The station sold another truck load of hogs at the livestock auction at Scottsbluff, receiving $3.05 per hundredweight. The top for Omaha that day was $3.15. There has been little change in the price of other farm products.

The average maximum temperature for the week ending December 3 was 58, with a maximum of 69; the average minimum was 26, with a minimum of 18. No precipitation was recorded. The average wind movement was five miles per hour.

The temperature during the month of November was above normal. The average maximum was 53° as compared with 49 for the 21-year average. The average minimum was 24 as compared with an average of 22° for the same period. The mean temperature for the month was 3° above the average. The precipitation for the month was .21 inch.

The slicing of beets at the Great Western sugar factories in the valley, with the exception of the one at Gering on the south side, was completed at the end of the week. This was much sooner than had been expected. Due to the very favorable weather conditions, the beets were received at the factory in much better condition than usual, and all of the factories sliced considerably more than their usual capacity.

During the week the lambs were weighed, and the test feeding period was begun on the 1st of December.

The work at the station consisted of the routine work of caring for the stock and the moving of fences along the south side of the station in order to get them out of the way of the grading work on the road. The pasturing of ditch banks with sheep will be discontinued on the section of the laterals.

Butterfat prices have advanced rather sharply during the week. Sweet cream is selling for 22¢ a pound of butterfat, an advance of 3¢. All livestock prices were reduced during the week.

James A. Holden.

Yuma

The mean minimum temperature for the week ending November 19 was 43, absolute maximum 86, mean 62.6, and the greatest daily range 46.

The weather has been normal for this time of the year, warm during the day and cool at night. The minimum temperature for the season came on the 13th and 14th when the thermometer fell to 38 and 36, respectively.

The grain sorghum plots in the rotations were threshed during the week. The yields were very similar to those of 1931. Some yields, however, fluctuated rather widely due to various causes. Three year rotation No. 30--consisting of cotton; sweet clover, grain sorghum, and barley; sweet clover and corn--received an application of 300 pounds of acid phosphate on the sweet clover that preceded the grain sorghum. This is the first year this treatment has been used, and the yield of grain sorghum jumped from 22 bushels per acre in 1931 to 44.5 bushels this year.

Yuma (cont'd)

Station work during the week consisted of threshing grain sorghum, repairing ditches, picking cotton, cutting grain sorghum stalks, disking, and planting barley on the rotations.

The absolute maximum temperature for the week ending November 26 was 85, mean maximum 81.4, absolute minimum 41, mean 44.3, and the greatest daily range 40. No frost has been recorded so far this fall. The mean first frost date in the fall over a period of 21 years is November 20. In some respects a frost would be helpful as it would kill much of the Bermuda grass and permit burning.

The sorghum varieties on B-5-6 were threshed during the week. The test consisted of eight varieties of the Dwarf type of grain sorghum. There was considerable variation in the stand due to moisture at the time of planting. Although there was a much better stand of Dwarf Hegari than of Club Kafir, the latter yielded 5.3 bushels more. The yields of the different varieties in bushels per acre follow:

Fargo Straight Neck Milo	52.6
Yellow Kafir	44.0
Beaver Milo	38.0
Double Dwarf Milo(check)	53.8
Club Kafir	51.2
Dwarf Hegari	45.9
Wheatland Milo	33.4
Custer Milo	24.9

An excellent yield is anticipated from the 1,500 acres planted to fall and winter lettuce on the project and it is expected that about 750 carloads will be harvested during December and January. The price is reported to be about $2.00 a crate f.o.b. Yuma, at which rate Yuma's crop will bring about half a million dollars.

Max E. Crannell.

M I S C E L L A N E O U S

Mr. C. S. Scofield left Washington on December 12 for Riverside, California, where he will be located for the next few months. He started on this trip in October but had to return on account of his daughter's illness.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division.)

Vol. XXXIV December 10 and 17, 1932 No. 25

Belle Fourche

During the week ending December 10 the maximum temperature was 55 and the minimum —20. The precipitation was .07 inch.

Good weather continued up to December 4 and field work could be done up to that time. On account of the favorable weather conditions during November all fall work was well advanced before the ground finally froze on December 6. Since this date the temperature has been continually below zero with a minimum of —20 on December 9.

The lambs in the feeding test were weighed on December 4. They had made an average gain per head to that date of 14.58 pounds. The average daily gain for the first 30 days was .151 pound and for the next 29 days .347 pound. The average daily gain for the combined periods was .247 pound.

The sugar factory will close the first of next week. The total acreage for the district was 7,825 with an average yield per acre of 12 tons. Sugar beets is about the only crop that has brought any cash into the district.

The local elevator is paying 23¢ a bushel for wheat, 40¢ a hundred for oats, 25¢ for barley, and 40¢ for corn; but very few sales are made at these prices. Good alfalfa hay is selling for $4.00 to $4.50 a ton in the stack. Butterfat is selling for 19¢ a pound, and eggs for 25¢ cash and in trade at the stores 32¢ a dozen.

Over 60,000 lambs are being fed in the district. This will help to dispose of some of the surplus grains and feed at somewhat better prices than they can be sold for cash.

Beyer Aune.

Huntley

The maximum temperature for the week ending December 10 was 30, minimum —30, and precipitation .03 inch. The first severe winter weather of the season occurred during the week and subzero temperatures were recorded on four days. The lowest temperature, which was on December 10, was —30. This cold weather was accompanied by a light snowfall.

Lambs in the feeding experiment continue to make satisfactory gains. It is planned to close the experiment and hold a feeders' day on January 7 after a feeding period of 85 days.

The results of the fertilizer experiment with sugar beets indicate that the use of superphosphate had a slight beneficial effect in increasing yields. The average yield of three plots, treated with treble superphosphate at the rate of 95 pounds to the acre, was at the rate of 21.88 tons per acre as compared to an average yield of 18.71 tons per acre on eight check plots. Higher rates of superphosphate apparently

Huntley (cont'd)

did not result in yields higher than on the check plots. In the "triangle" plots, in which various amounts of nitrogen, phosphate, and potash were used, the yields in most cases were from one-fourth ton to 1¼ tons higher than on the check plots, and the differences in most cases were not great enough to be significant. The sugar content ranged from 16.2 to 17.8 per cent.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending December 17 was 31.2, with a maximum of 64 on December 5; the average minimum was 2.3, with a minimum of —17 on December 12, 13, and 14. The mean temperature was 16.8. The average hourly wind movement was 1.65 miles. There was .07 of an inch of precipitation.

The minimum temperature of 17° below zero, prevailing on three successive days, was the coldest December weather ever experienced at this station during the 27 years that weather data have been recorded here. During January 1917 the all-time record of 25° below zero was established. However, this year's low was the coldest recorded in any month since January 1924 when the mercury stood at 18° below.

The extremely cold weather during this period has made it impossible to do very much field work. All plowing was stopped, and most of the land leveling operations were at a standstill for a week. However, the tractor is operating again and the leveling has started once more.

During periods of extremely cold weather it requires the services of one man to keep pipes thawed and water flowing to the various buildings for domestic purposes and stock watering. Fires are kept up all night in the different buildings in an endeavor to prevent inside plumbing from freezing.

The State has a large outfit at work grinding hay for the dairy experiment at the station. It is hoped to get enough ground at this time and under cover to supply the needs of the dairy cows until spring. The barn, which will hold 60 tons, will undoubtedly be filled to capacity.

E. W. Knight.

Prosser

The maximum temperature for the week ending December 10 was 53°, the minimum was 3° below zero, and the greatest daily range was 26°. The first subzero weather of the season occurred on December 10 when the temperature fell to 3° below zero. The latter part of the week the temperatures were constantly below freezing.

The market was fairly steady during the week, although butterfat decreased 3¢ per pound and is now 23¢. Hops advanced ½¢ a pound and are now 27½¢.

Most of the week was spent working on a water requirement report for the Walla Walla Valley.

Mr. M. R. Lewis, Agricultural Engineer, stationed at Corvallis, Oregon, visited the station December 7 to help formulate plans for cooperative work for an irrigation engineer.

Prosser (cont'd)

The maximum temperature for the week ending December 17 was 28° and the minimum was —6°. Zero or subzero weather occurred on the first five days of the week.

Prices of produce in the Yakima Valley: Wheat advanced 2¢ and is now 40¢ per bushel. Alfalfa hay No. 1, first cutting, is $6.00 to $7.00 per ton. U. S. No. 1 potatoes are $8.50 to $9.50 per ton. Barley and oats are quoted at $13 and $16 per ton, respectively. Hops are 27½¢ per pound, and the market is quiet. Eggs are 28¢ per dozen for average large whites, and butterfat is 23¢ per pound.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending December 17 was 18°, with a maximum of 30; the average minimum was 9 below zero, with a minimum of 28 below. There was no precipitation. The average wind movement was 5.4 miles per hour.

During this period and about half of the previous one there has prevailed the most protracted cold weather for this early in the winter that has ever been recorded at the station. The average minimum temperature for ten days in succession was 13° below zero, and for 12 days the maximum was never above freezing. Rising temperatures were predicted at the end of the week.

The initial payment for beets produced in the valley was completed this week, making a total of $3,065,135. The final payment, if any, will be made next fall.

The average yield for the Nebraska district this year was 13.62 tons per acre as compared with 14.34 tons last year and an average for the past three years of 14.19 tons per acre. The average sugar content was about 15.50 per cent as compared with 16.33 per cent last year.

There has been little change in the prices of farm products since the last report.

The annual meeting of the State Irrigation Association was held at Scottsbluff during the week. It was well attended by all sections of the North Platte Valley.

James A. Holden.

Yuma

The absolute maximum temperature during the week ending December 17 was 62, mean maximum 57, absolute minimum 31, mean minimum 35.1, and greatest daily range 31. A precipitation of .44 inch was recorded.

Yuma was surprised on the 12th by a snowstorm. It was the first one in the 70 years since a station of the U. S. Weather Bureau has been located at Yuma. The meteorologist reported 1½ inches of snow. At the station the snow melted as fast as it fell. There was sleet, however, on the roofs. There were no freezing temperatures until the night of the 15th when the mercury fell to 31. A minimum thermometer placed one foot from the ground had a reading of 28. This was the first frost of the fall, making a frost-free period of 304 days. This is the second year in a period of 22 years that the first frost date was this late.

Yuma (cont'd)

The cold weather has not seriously injured the crops. It has been a benefit to the lettuce crop, making for firmer heads. How much damage the freezing weather did to the early winter strawberries is not known yet. Ripe berries have been marketed by Mr. John R. Hopper of Gadsden and Mr. S. Colby of Bard. Mr. Colby reports that he will have a few hundred trays of strawberries on the market by Christmas if freezing weather does not prevail.

The clear sky and warmer days during the last of the week brought relief to the citrus growers of the valley. Little damage is expected from the recent cold spell. The cool weather this fall has hardened the trees for winter. The damage wrought in 1932 was the result of a temperature of 22° without a period of cool weather. The fruit that has been sold near the station has been to independent buyers from Los Angeles. The prices for grapefruit have been from 1¢ to 1½¢ per pound on truck at the orchard.

An excellent stand of barley was obtained on the plots that have emerged. This year the barley was sown before the land was irrigated. Heretofore the ground was irrigated in the rough, then worked down when dry enough, harrowed and seeded. This is a good method where the ground is cloddy and level. However, if there are low spots, the high area will dry out too much before the ground can be worked.

Station work during the week has consisted of ginning and picking cotton, mowing alfalfa hay, and cleaning irrigation ditches.

Max E. Crannell.

WEEKLY REPORTS

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

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Belle Fourche

The feeder lambs were weighed January 3, after being on feed 90 days. The following table shows the average daily gain for each lot for each 30-day period and also the average for the 90 days:

Ration	Average daily gain 30 days	Average daily gain 29 days	Average daily gain 31 days	Average daily gain 90 days	Average individual gain 90 days
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Lot 1- Corn, alfalfa hay	.153	.379	.347	.292	26.25
Lot 2- Barley, alfalfa screenings, pulp, alfalfa hay	.144	.334	.339	.272	24.51
Lot 3- Barley, pulp, alfalfa hay	.157	.358	.303	.273	24.60
Lot 4- Oats, pulp, alfalfa hay	.146	.279	.309	.249	22.39
Lot 5- Wheat, pulp, alfalfa hay	.162	.334	.323	.276	24.86
Lot 6- Wheat, oats, pulp, beet tops, alfalfa hay	.084	.431	.337	.287	25.83
Lot 7- Corn, pulp, alfalfa hay	.209	.311	.364	.295	26.57
Average	.151	.347	.332	.278	25.00

The difference in gain made by each lot is rather small. The best gains were made in the lots fed corn and the smallest gain in the lot fed oats. The amount fed per lamb per day during December was 1.5 pounds of grain, 2 pounds of pulp, and about 1.5 pounds of alfalfa hay. The grain will now be increased to 1.75 pounds per day for the rest of the feeding period.

The average price paid for feeder lambs in this district in 1932 was $3.75, and the average price received when sold at Sioux City is about $5.50 to date. On this basis, grain has netted about 70¢ per hundred and alfalfa hay about $5.00 per ton on the farm when fed to lambs.

It is now planned to have Lamb Feeders' Day on February 15.

Beyer Aune.

Newlands

The average maximum temperature for the two-week period ending December 31 was 45.5, with a maximum of 59 on December 19; the average minimum was 13.3, with a minimum of 7 on December 22. The mean temperature was 29.4. The average hourly wind movement was 3.07 miles. There was .05 of an inch of precipitation.

Newlands (cont'd)

In addition to the usual routine work of the winter months, land leveling operations are being carried on at the station. A tractor and two wheel scrapers are being used to move dirt to make the necessary fills. A rather long haul is required in these dirt moving operations, and as a result progress is rather slow. However, it is expected that the work will be completed before seeding time in the spring.

Butterfat prices have dropped to 24¢ a pound. For a short time the price remained above 28¢, at one time reaching 31¢. The prices received for the Christmas shipments of turkeys will net the growers about 14¢ a pound. This price does not give much profit to the turkey producers this year, but it was a top price for turkeys on the western coast.

E. W. Knight.

Scotts Bluff

The average maximum temperature for the week ending December 24 was 39°, with a maximum of 48; the average minimum was 12, with a minimum of 6. The wind movement averaged 7 miles per hour. There was a trace of moisture on the 24th when there were a few snow flurries accompanied by a very high wind. There was not enough snow to drift badly and it was somewhat localized as it extended only a short distance east of Bridgeport or the eastern edge of the project.

Some fencing was done on the Walker tract so that the stock might be turned into the fields. Notwithstanding the extreme cold weather, little difficulty was encountered in digging post holes. The ground was so dry that frost had penetrated only a few inches.

Sheep feeding in the valley is exceeding the early estimates, and it is believed as many will be fed this year as last. A few flocks were brought in during the past week, and some shipments have been made to market.

At present the sheep market is in a very favorable position. Hogs have declined to a new low of about $2.70, while cattle are the lowest they have been for a long time. Butterfat has declined to 21¢ per pound. Eggs have remained steady on the local market at 28¢ a dozen. Old hens are selling at 5¢ a pound, young chickens under 10¢.

Feed prices are the lowest ever known in the valley. In the dry land sections corn is selling at 11¢ a bushel, and in many places it is being used for fuel.

The average maximum temperature for the week ending December 31 was 36°, with a maximum of 49; the average minimum was 12°, with a minimum of 2. The average wind movement was 7.9 miles per hour. No precipitation was recorded.

The month of December has been much colder than normal. The average maximum for the month was 31, the average minimum 5, and the mean 18°, as compared with a maximum of 42, minimum of 15, and mean of 28.5° for last year. The precipitation during the year was 10.87 inches, which is 4 inches below the average from 1911 to 1932, inclusive--14.88. The last two years have been very dry, thus bringing the average for the period down below 15 inches, the lowest it has ever been.

Markets: Potatoes have made a slight advance and 40 to 45¢ is now being offered, but few are being sold. Butterfat has dropped to 18¢, and eggs are down to 23¢ per dozen. Fat lambs are holding steady at a top of $5.75 and choice steers around $6.50. The top on hogs at

Scotts Bluff (cont'd)

Omaha the last of the week was $2.75. On the local market fat hogs sold for $2.50.

James A. Holden.

Yuma

The maximum temperature for the two-week period ending December 31 was 67, the minimum was 26, and the greatest daily range was 40. The precipitation was .11 inch. For the month of December the maximum temperature was 80 and the minimum was 26. The precipitation was .55 inch.

A summary of the meteorological data for the season of 1932 shows that the maximum temperature was 113 and occurred on September 4. The minimum of 19 came on January 25. The total rainfall for the year was 5.10 inches. This moisture came in general storms during February, July, October, and December. March, May, and August were absolutely dry and only a trace of rain was recorded for the other months of the year. The heaviest rain of the year fell on October 9, 10, and 11 when a total of 2.85 inches was recorded.

At the end of the year many farmers on the project are asking for relief or some form of financial assistance to meet the payments on construction charges due January 1. The Yuma Valley division of the project is asking its members of Congress to present some kind of a plan for relief.

Prices for cotton, alfalfa hay, and seed, grain sorghum, and livestock remain at low levels. Shipments of lettuce have continued for the past two weeks, but only occasionally have prices reached a profitable point.

Cotton picking on the project will soon be completed. The ginning report shows that 5,925 bales have been turned out to date. For this same period in 1931, 10,221 bales were ginned.

The final picking of Pima cotton on the rotations will be completed soon. The yields will not be up to early season expectations. Station work during the period included the picking and ginning of cotton; plowing, seeding, and irrigating barley and alfalfa plots; cleaning ditches; repairing pipe lines; general cultivating and irrigating.

Mr. and Mrs. C. S. Scofield and Miss Marcia Scofield stopped over at the station on their trip west to Riverside on December 21.

W. G. Noble.