

Santa Fe Agricultural Bulletin No. 6.

# PRACTICAL INFORMATION

FOR THE FARMERS OF  
**Central West Texas**



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## INTRODUCTION.

The reading matter in this Bulletin has been very carefully prepared and was written especially for West Texas agricultural conditions.

The object of the bulletin is to encourage diversified farming in all of its branches; to awaken more interest in better tillage methods, to emphasize the importance of better seeds and to show the importance of live stock in connection with better farming methods.

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## DIVERSIFIED FARMING

Under limited rainfall conditions, no farmer can afford to depend on a "one crop" method of farming. He *must* diversify. He must be able to sell something besides grain and fodder.

**MUST HAVE LIVE STOCK:** Good money returns can be depended upon only through a diversified farming system in connection with live stock. By raising poultry and hogs in connection with a few cows, backed by the right kind of farming, means plenty of food and clothes for the family, better education for the children, larger bank deposits and better, happier families.

With live stock as part of a diversified farming system, more than one kind of crop must be raised. When a farmer gets to where he owns considerable live stock, he will also be to a point where he will put forth extra effort to raise different crops to feed them. In connection with these live stock feeding crops, it is usually advisable to raise one or two money crops as cotton or wheat.

**MORE THAN ONE CROP SYSTEM:** The successful farmer does not put all his eggs in one basket, in addition to wheat, corn or cotton, he will also raise kafir, milo maize and other crops he is reasonable certain of. Then in case one crop fails, he has something else to depend upon.

It often happens that the grain or seed crops practically fail and very little is raised besides roughness. It is at these times that the old cow and hen must be trusted to carry over the family and pay the taxes and interest.

**PROLONG PLANTING SEASON:** Again, the diversified farmer does not plant all of any crop at one time; he prolongs the planting period somewhat. In planting kafir, some of it should be planted reasonably early, part of it late and probably the remainder of it in between, in this way all of it may make a crop, but part of it is almost certain to make.

The farmer who diversifies his crops is the man who adds to his bank deposit in spite of 8 cent cotton.

**CROPS TO PLANT:** In some sections, wheat may be considered as a good cash crop, while in other sections cotton is best. Some years these crops may yield enough to practically pay for the land, but other years they may not return the seed. Failures in these and other crops may cover from one to three years. The farmer who depends on these crops for his entire income, is likely to fail also.

Crops must be planted every year that are practically drouth resistant. Corn cannot be depended upon with any degree of certainty. It is not "King of Crops" under limited rainfall conditions. The farmer cannot afford to plant it only in small acreages.

Cotton is a reasonably sure crop under limited rainfall conditions providing the season is long enough. An early maturing variety of storm proof qualities is preferred.

Kafir and milo maize are practically sure. Maize is more certain than the kafir. Instead of planting all kafir or maize, it is best to divide the acreage and plant some of each. Sorghum is practically sure to make roughness and makes excellent feed for dairy cows. Stock melons will take the place of pumpkins in furnishing a succulent feed for cows and hogs.

Kafir and milo maize are practically equal to corn for hog feeding

and dairying. They are better for poultry feeding than corn.

**THE DAIRY PAYS:** Every farmer of limited means should collect around him, as soon as possible, a small herd of cows. These should yield him a constant income at the rate of from \$25.00, to \$60.00, per cow each year, providing they have been properly selected and handled. The native grasses are excellent milk producing feeds for all times of the year. Crops for winter feeding must necessarily be raised for the herd. Cows will consume a great deal of roughness that otherwise would be wasted.

**SIL0:** Every farmer who diversifies and handles live stock should own a silo. Almost all classes of feeds make good silage regardless of whether they are fully matured or not. When dry weather is about to kill a crop of forage, it can be placed in the silo with very little waste. Ordinary fodder is about one fourth as good in feeding value as the silage coming from the same acreage.

Hand in hand, dairying goes along with poultry raising and pig feeding. The skim milk should be fed to the calves and pigs with kafir or milo maize.

**POULTRY:** Our conditions are very favorable to poultry. Kafir and milo maize are unexcelled as poultry feeds. Expensive buildings are not necessary. With reasonable care, the owner can easily realize \$1.00 net in cash from each hen every year for eggs alone.

**GARDEN:** The family garden must not be neglected. Often this can be located near the well so that it can be irrigated. Fall and winter irrigation is advisable on the garden patch. Then by plowing it deeply very early and giving it a chance to get settled by planting time, a good garden is practically assured.

The farmer who diversifies his crops and then does not depend upon them entirely, but rather grows them in connection with the dairy, poultry and hogs or perhaps other lines of live stock raising, is sure of his living expenses and a reasonable saving.

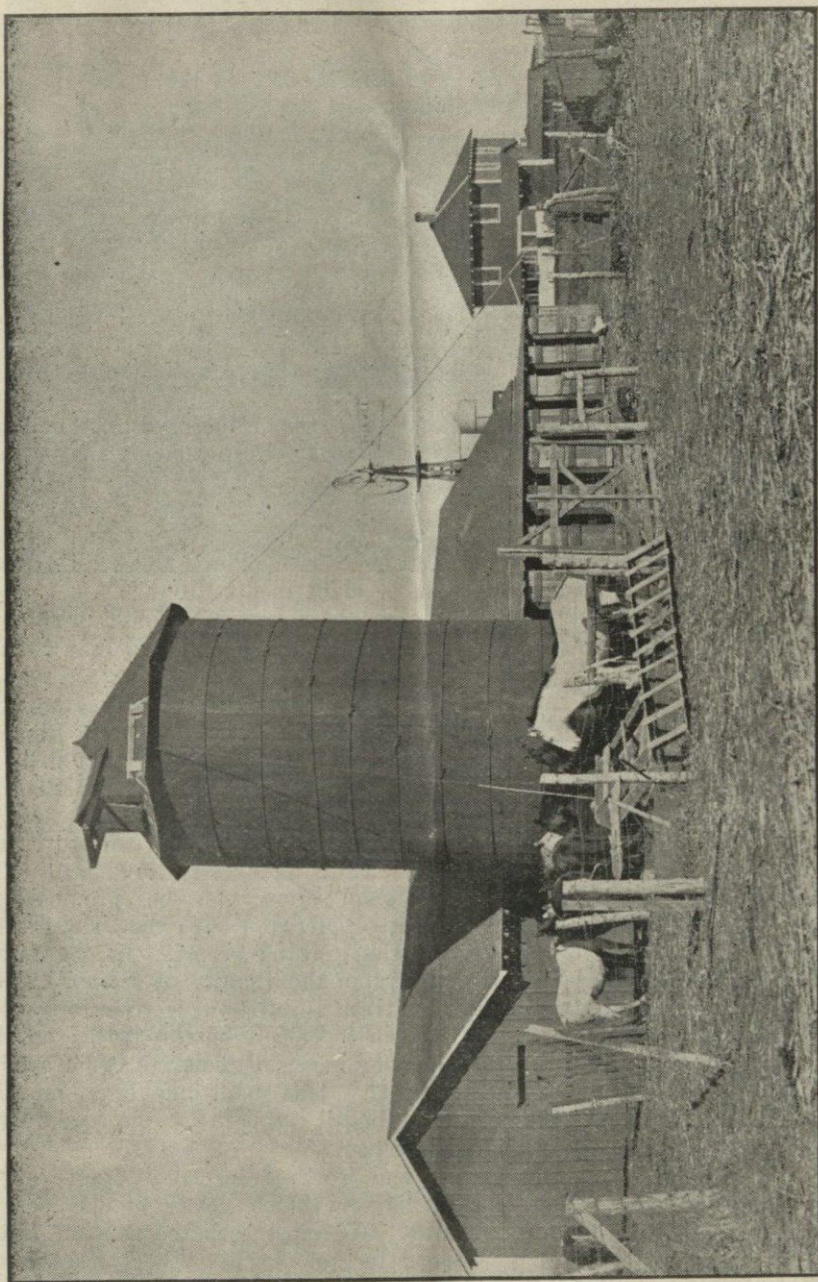
The live stock will keep the farm in better condition, preserves its fertility and enables the farmer to sell his crop in a more concentrated form and for better prices. Then in good seasonable years a wheat crop or cotton crop puts him that much ahead.

## BETTER TILLAGE METHODS

Why is it, there are always one or two farmers in every neighborhood who produce larger crops than the average? Is it because they have better soil, more moisture, or are they always naturally favored? If it was not for the fact that they do this every year, we might say that the increased yields were not due to better work, but under the circumstances they must be given credit for better methods.

**WHAT CONSTITUTES BETTER METHODS?** This may be summarized about as follows:

1. To prepare a deep, well pulverized seed bed at the right time.
2. To handle less land and do the work more thoroughly.
3. To exercise every precaution to store and save the moisture.
4. To select and use better seed, planting less to the acre.



A Stave Silo.—Today silos are almost as common as barns in well developed dairy sections and in diversified farming districts.

5. More frequent and thorough cultivation during the growing season.
6. To work more vegetable matter (humus) into the soil.
7. To keep down the weeds.
8. Not to raise the same crop continuously on the same land, year after year, but to rotate.
9. To handle more live stock in connection with the farm.
10. To raise a good garden, even if it has to be irrigated from a wind mill and supply tank.

### SEED BED

In making the seed bed it is well to remember that:—No after cultivation can make amends for poor preparation. Our poorest farmers are those that plow the least and shallowest. The writer has found several so-called farmers who are continuously putting in crops without even owning a plow.

**MUST PLOW DEEP:** This is especially true on the hard or tight lands. The sandy lands do not require as deep work. Deep plowing makes more root space, provides a reservoir for moisture and makes more plant food available.

The depth of our farms is the depth we plow. Ask yourself the question, "Can I raise as large crops on a farm plowed three inches deep as on one that has been plowed six or eight inches deep?" Your answer should be, emphatically, "No." It has been proven beyond doubt that the roots of plants grow deeper and do better in deep plowed land than in shallow plowed land.

**MUST PREPARE A PLACE FOR QUICK ACCUMULATION OF MOISTURE:** Our rains often come in torrents and unless a deep seed bed has been prepared, they will largely run off. It is not the mean annual rainfall that will save the country and make crops, but rather the amount of moisture that can actually be saved and made available to these crops.

There is no better soil in the United States to hold moisture than Northwest and West Texas, if it is properly prepared. We have learned by experience that good crops can be produced on seed beds that have been properly prepared at the right time with but very little rainfall during the growing period. In the fall of 1909, several extra good wheat farmers in the vicinity of Pampa, Texas, prepared their wheat ground early, cultivated until sowing time to save the moisture and made from 20 to 25 bushels per acre on the 1910 crop. The rainfall record showed from three to four inches of moisture to have fallen on this wheat during its growing period. This small amount of moisture would hardly have kept the crop alive, had it not been for the accumulated moisture in the properly prepared seed bed.

Drouth begins at the surface and works deeper and deeper as the dry spell prolongs. Deep moisture is very much slower to disappear in drouthy times than shallow moisture. We must keep the sub-soil full of moisture and thus encourage the roots to grow down. When once the sub-soil has become well filled with moisture, with 8 to 12 inch plowing, it will be next to impossible for our most severe drouths to dry it out, especially if it is properly cared for.

**WHAT IS DEEP PLOWING:** Ordinary plowing runs from three to six



Plowing sixteen inches deep with Spalding Deep Tilling Machine.

inches in depth. Deep plowing is not less than eight inches and from that to twelve and sixteen inches. The average depth of plowing in West and Northwest Texas is three and a half inches on old ground, which is not one half deep enough. Eight inch plowing properly handled would insure crops practically twice as good. These depths should be reached gradually instead of all at once.

**WHEN SHALL DEEP PLOWING BE DONE:** All deep plowing should be done as long before seeding time as possible. This gives the ground time to become well settled, which is very necessary. It also enables the soil to catch and hold all moisture falling upon it. The sub-surface packer is an excellent implement to use immediately after the plow to firm the ground. A disc harrow run straight will also pack soil. All ground should be harrowed immediately after plowing.

**FALL PLOWING:** Fall plow for spring planting and summer plow for fall planting. For various reasons already state, we must give deep plowing, time to settle, accumulate moisture and make more plant food available.

As soon as the fall crops have been gathered, this deep plowing should be begun, there is no better time to plow for spring crops than between October and January or even to February 1st. For example, if such work had been done during the months just past, this last fall, the moisture that has fallen would all be stored where it could be saved. Then by working the surface whenever it is dry enough during winter and early spring months, this moisture would have been retained for this year's crops. In addition to saving the moisture, the early preparation and later

surface cultivation makes plant food, which is also stored for future crop growth.

It is not advisable to plow deep for spring crops after February 1st, as the soil will not have time to settle. Deep plowing can be done after this date if it is thoroughly packed immediately after the plow with some sort of packing implements, like the sub-surface packer or disc harrow run straight.

**SPRING PLOWING:** On account of light rain fall in the spring months, it is not advisable to do deep plowing after February 1st, especially for immediate planting. It takes moisture and time to settle freshly plowed soil. All spring plowing should be harrowed immediately after the plow. The harrow attachment for plows is an excellent implement.

**DOUBLE DISCING AND PLOWING:** Land that is to be planted to some fall crop, should be plowed in July, if possible. If the fall crop is to follow a small grain crop, the ground should be double disced immediately after the binder or header. The sooner this work is done after harvest, the better. Every day's delay means the loss of moisture. The object of discing at once is to kill all small weeds, make a soil mulch, hold the moisture and put the ground in condition to catch such moisture as may fall on it before plowing. By doing this, the ground will be kept in condition for summer or early fall plowing. Weeds take out the moisture almost as fast as a hard baked surface.

If this ground is not plowed soon after the first discing, it will be necessary to disc again about a month later. Weeds must be kept down and crusts must be broken. The common harrow will often do the work if used at the right time.

Some say "Why not begin plowing at once instead of wasting time discing?" This would be alright if we could hold the moisture and get ahead of the weeds, but usually one or two weeks hot, dry weather after harvest will dry out the ground too much for plowing. The disc will cover the ground quickly and will insure holding moisture until the plowing can be completed. The early discing also works the ground at a time of year when plant food is being manufactured most rapidly, which is another point in its favor.

Plant food is manufactured in the soil in the presence of heat, air and moisture. Early deep summer plowing therefore gives a long season for this process and also gives the soil a chance to settle and accumulate moisture.

July plowing if properly handled thereafter, practically insures a good stand of wheat and is far more desirable than later preparation. August plowing is better than that prepared in September. Ground prepared after Sept. 1st, must naturally be worked shallow and at the risk of making a poor crop.

### SUMMER TILLAGE

What is known as summer tillage is practiced with excellent results in many sections of limited rainfall. Under this method the ground is cropped every second year. It has for its main object the storing in the soil of as much of two years' rainfall as possible, for the growth of one crop.

Under this system the land is usually plowed deep in the fall, un-



less there is extreme danger of blowing. It is kept in a good state of cultivation as far as the surface is concerned until planting time, the following fall. No weeds are allowed to grow and all crusts are kept broken. In other words, a good soil mulch is maintained constantly. In this way a large part of the moisture and plant food of two years is stored for one year's crop. Briefly summarized, summer tilling clears the land of weeds, it improves the physical condition of the soil, saves the moisture and makes more plant food.

The following results of summer tillage were obtained at the San Antonio Experimental Farm during the season of 1909. This gives a comparison and yields from crops grown on summer tilled land and on land cropped the preceding year:

CROP—	Land Cropped	Land Summer Tilled
	in 1908	in 1908
Cotton .....	596 lbs.	783 lbs.
Corn .....	3.3 bu.	22.6 bu.
Sorghum .....	1.9 tons	5.0 tons
Oats .....	0.0 tons	1.25 tons

The following results of summer tillage were obtained at the North Platt Nebraska Experimental Farm as a result of five year's work. This is reported in Bulletin No. 118 of the Nebraska Experiment Station.

#### YIELD OF WINTER WHEAT

Year	Cropped every year	Summer Tilled
1907 .....	24.4 bushels	59.0 bushels
1908 .....	20.8 bushels	57.0 bushels
1908 .....	29.0 bushels	57.0 bushels
1909 .....	19.0 bushels	37.6 bushels
1910 .....	0.0 bushels	30.2 bushels

The summer tilled land produced six bushels per acre, more than twice that produced on the land not summer tilled.

It is true, summer tilling requires more work than is needed for producing a crop every year, but it is not nearly double and only one half as much seed is required.

#### VEGETABLE MATTER NEEDED

The water storage capacity of a soil is determined largely by the conditions covering depth of seed bed, how well it has been pulverized and by the amount of vegetable matter, (partly decayed vegetation) or humus in it. This humus helps to hold the moisture, it also helps to make soils loose and prevents them from running together or baking.

A pound of humus will store seven and one half times as much moisture as a pound of sand and the sand will loose its water by evaporation three and one half times more rapidly than the humus. A clay soil will store about one fourth as much moisture as humus and will loose it by evaporation twice as fast.

The best way to add this vegetable matter to the soil is to grow some such crop as cowpeas, rye or sorghum and then plow it under in a green condition, before frost. If moisture enough is available, after taking off a small grain crop, it is a good idea to plant cowpeas in rows and cultivate them until nearly frost when they should be plowed under deeply, in the green condition.

If cowpeas cannot be raised, fall sown rye, allowed to grow until spring and then turned under in a green condition after making a good

growth, will answer the purpose, but not as well as cowpeas.

No stubble or trash should be burned off the fields, but rather should be plowed under. Humus improves the fertility of the soil in addition to increasing its water holding capacity.

### SAVING THE SOIL MOISTURE

In the first place the soil must be put in condition to receive all moisture falling upon it and to store it instead of letting it run off. As soon as the moisture has been stored, work must begin at once to hold it. There is no other soil that will hold moisture better with the same amount of work, than that in Western and Northwestern Texas.

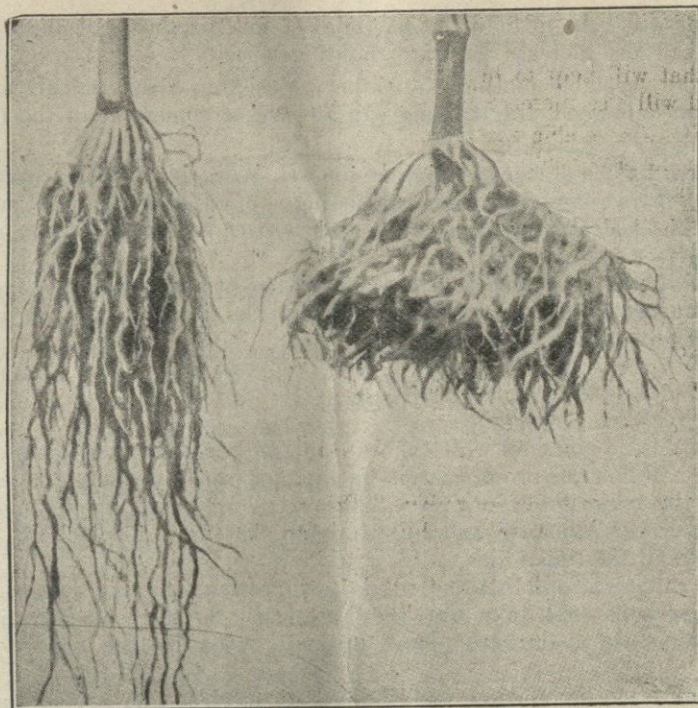
**SOIL MULCH:** At no time should a crust be allowed to form on the surface of a field that is being prepared for a crop or that has a growing crop on it. Evaporation from the soil is going on practically all the time. During the times of evaporation, moisture is constantly carried from the lower soil to the surface by what is known as "capillary movement." This capillary movement brings the moisture to the surface like oil through a lamp wick, where it escapes into the air. This constant drain soon dries out a soil.

Moisture moves upwards readily through a firm soil and slowly through a loose soil. Thus by providing a loose surface or mulch this process of evaporation is checked. The mulch acts as a blanket or insulation, saving the moisture below it.

We must not get the soil mulch confused with the so called "dust mulch." A fine dust mulch is dangerous. In the first place it is liable to blow, and in the second place, moisture from above does not pass through it readily. Water will often flood off a dust mulch before it will pass through it.



Campbell Packer.—An extra good implement for packing deep plowed soils.



Corn roots showing the effect of deep and shallow plowing, from actual photograph. Long roots grew on ground plowed 16 inches deep in the spring of 1911. Short roots grew in same field not over two rods away from where the long roots grew, but on land that had been plowed from 5 to 6 inches deep. The yield on the deep plowing was 25 per cent more than on the shallow plowing.

What is wanted in the way of mulch is to keep a loose surface, but to be careful not to work it too fine. Small clods mixed with the surface, will prevent blowing, it holds the moisture below, lets surface moisture pass through readily and answers every requirement.

**DEPTH OF MULCH:** The shallow, one or two inch mulch, is not deep enough for long hot dry spells, as it becomes heated through too easily and lets the moisture dry out under it. Early in the season the shallow mulch is alright, but later, as the danger of hot, dry weather comes on, this depth must naturally increase, a three and four inch depth should be reached by this time.

The common peg tooth harrow is the best implement for this work, especially if considerable depth is not needed. On account of depth, a disc harrow is often necessary. A float or drag very seldom does much good. As a rule, it leaves the mulch too fine and too shallow.

**WHEN THERE IS DANGER OF BLOWING:** As the grass roots disappear and little vegetable matter is added to a soil, the danger from blowing increases. Old land blows, therefore, worse than new land. By working more vegetable matter into the soil in the form of plowing under green crops, manure, stubble, etc., this danger from blowing will decrease. Any-

thing that will help to hold the particles of soil together will check blowing and will also increase the water holding capacity.

Where vegetable matter cannot be worked into a soil quickly enough to do immediate good, the drifting can be checked somewhat in the following ways:

Harrow when surface is slightly too wet. Work ground into corrugated condition, or in ridges and furrows. Listing is often advisable. Drifting can often be checked by spreading straw lightly over a field. Manure spread on the surface is also good.

Avoid working the surface too fine or too smooth. It is a dangerous practice to use a smooth roller on old land that is subject to blowing, a corrugated roller is very much better.

## WEEDS

There is no point on which more criticism is needed than on the weed question. Maximum crops cannot be expected when we stop to consider that on the majority of our farms the weeds get more of the moisture than the crops. Moisture and humus is all that our soils lack to insure good crops all the time.

We cannot afford to grow weeds to supply this humus, because they poison our soils and take out the "precious" moisture needed by the crops. Moisture is our crop bank account, weeds are the deadly mortgages.

There is no better time to kill weeds than when they are in the germinating stages. If done in time, there is no better implement for the work than the common peg tooth harrow.

**TRY TO HANDLE TOO MANY ACRES:** Our farmers are doing too much "extensive" farming and not enough "intensive" farming. Too many acres are being "hogged-over," for the good of the yield. One of the greatest troubles with farming operations in this country is, too much land is farmed by sections instead of half and quarter sections. To try to handle two and three times as much land as the horse power or implements will justify, practically insures crop failure.

If we are going to farm successfully on a large scale, we must exchange our single plows for gangs; our one-row planters and cultivators for two-row implements; our two-section harrows for four to six section harrows and all other implements in proportion. The power applied will also have to change from the old one and two horse system to larger units. We must go on the basis that it takes four times as much implement capacity and horse power to handle 100 acres as 25 acres with similar methods, although one man can handle the large equipment with but very little more work from his standpoint.

One man with two horses and a single plow can hardly plow two acres per day, while the same man will easily plow five acres per day with a gang plow and five or six good horses. Thus the returns from the one man's labor is at least two and one-half times greater with the large equipment.

Under limited rainfall conditions the farmer must be able to get over his fields often and quickly. A heavy dashing rain causes the ground to crust over very quickly, as it begins to dry and unless this crust can be broken within a very short time, much of the moisture will escape.

There is only two solutions to the problem, we must either farm fewer acres or use larger units in cultivating and handling.

### BETTER SEED NEEDED

"Like begets like." Inferior seed cannot and will not produce maximum crops. The best seed is none too good for our conditions. There is no question but that our wheat, oats, cotton, kafir, maize and other crops, can be increased in yield and quality, at least one-fourth by the use of the right kind of seed.

The importance of good pure cotton seed was very forcibly brought out last year in connection with Santa Fe demonstration work in Northwest Texas above the "Cap Rock". Practically all demonstration cotton was planted with pure Mebane Triumph seed. The average yield of the demonstration cotton was 33 1-3 per cent better than that planted from the ordinary seed in the demonstration. The difference in yield was due wholly to seed and cultural methods.

Our kafir and maize seed is about as badly mixed and run down as our cotton, broom corn and other crops. What is needed now is the introduction of good pure seed for all standard crops. Following this, the proper selection and care of seed, will keep it up to standard. Seed properly selected and cared for will not "run out," but will improve.

**ACCLIMATED SEED.**—Seed should be secured as near home as possible. It should be grown under as near similar conditions of climate, rainfall and altitude, as it is possible to find.

Good seed, grown under limited rainfall conditions is usually superior to that grown under irrigation or humid conditions. The use of a fanning mill will do much to improve the quality of small grain for seed.

Select all seed from the field, as far as possible. Do not wait until planting time and then be compelled to select it from the sack or crib.

**MUST PLANT LESS SEED TO THE ACRE:** Many low yields can be traced directly to too thick stand. To insure good yields, every plant must have a chance. Northwestern and Western Texas conditions do not require over one-half as much seed as is usually planted under humid and irrigated conditions. Farmers of this section can save seed and money, besides insuring better yields by planting less seed per acre.

### AMOUNT OF SEED TO PLANT AND THICKNESS OF STAND

Alfalfa, broadcast .....	8 to 12 pounds per acre.
Barley .....	about 40 pounds per acre
Broom Corn .....	about 3 pounds per acre
Broom Corn, plants in row from 6 to 8 inches apart.	
Corn, plants in row from 30 to 36 inches apart.	
Cotton .....	one to two pecks per acre
Emmer .....	30 to 40 pounds per acre
Flax .....	about 20 pounds per acre
Kafir, plants in row from 15 to 20 inches apart.	
Mexican Beans .....	30 to 40 pounds per acre
Millet .....	20 to 25 pounds per acre
Milo Maize, plants in row from 12 to 15 inches apart.	
Oats .....	about one bushel per acre
Peanuts .....	about one bushel per acre
Rye .....	30 to 40 pounds per acre
Speltz .....	30 to 40 pounds per acre
Sorghum, for hay .....	about 40 pounds per acre
Sorghum, for seed .....	5 to 8 pounds per acre
Winter Wheat .....	about 30 pounds per acre

## BREAKING THE SOD

Shallow, two and one-half to three inch depth of breaking is preferred on all hard or short grass lands. This is not necessarily true of the sandy lands. This shallow breaking has several advantages. It can be turned more completely than deeper breaking. Sod turned shallow will decay quickly. The roots of crops growing on shallow breaking will penetrate through the sod and get into the moist soil below. The shallow furrow slice acts as a mulch, conserving and holding the moisture immediately below it close enough to the surface for the use of sod crops.

Deep breaking on the above type of soil does not produce the good results that come from the shallow breaking.

The loose or sandy soils are better adapted to deep breaking than the hard soils. In fact, they respond to deep breaking better than shallow breaking.

Freshly broken sod should be rolled or firmed immediately after the breaker. This can be done best by using some type of heavy roller. It is often advisable to drag the freshly broken sod with a harrow or float which will move enough loose dirt to fill up all holes and crevices.

The mold board or rod breaker will turn the sod better and more completely than the disc breaker. General results of breaking is also much better with the mold board than with the disc.

## ALFALFA

Our experience has proven to us that alfalfa can be successfully grown in many sections of West and Northwestern Texas. But it cannot be successfully grown without special deep preparation of the seed bed.

In order to kill the weeds and accumulate sufficient moisture to insure a good stand of alfalfa, it is usually desirable to summer till the ground the preceding season. Young alfalfa will not start and do well in weeds, therefore every effort must be used to kill them and to accumulate moisture before seeding time.

Deep fall plowing and summer tillage as described under "Better Tillage Methods" is about the only insurance of an alfalfa stand in this country.

Mr. F. M. Price, a good farmer of Floyd County, secured a good stand of alfalfa on high upland in 1907, just before the three year dry spell began. His field was divided into three parts and prepared by plowing early, as follows: First one third was plowed 4 inches deep; second one-third was plowed six inches deep, and the third one-third was plowed six inches deep and sub-soiled seven inches deeper. All was surface worked the same during the summer and the alfalfa was sowed in August. It came up to a good stand.

The alfalfa on the shallow plowed land nearly all died during the three dry years. That on the deep plowed land (not-sub-soiled) was still about three fourths of a stand in 1911, and that on the deep plowed, sub-soiled land was a good stand. The 1911 crop was excellent especially on the deep plowed and sub-soiled parts of the field.

There is no question but that 8 to 12 inch plowing done properly on old land, will insure alfalfa in many parts of this territory, even on the

high uplands. Alfalfa has already proven to be a successful crop in the draws, valleys and lowlands of this territory.

**ALFALFA IN ROWS:** In many sections of limited rainfall, alfalfa makes an excellent seed crop if planted in rows, thirty inches to three feet apart and cultivated. The cultivation keeps down the weeds and saves the moisture. This method of handling has proven very successful in many sections, especially for seed production. The seed crop in this way often makes as much as five bushels per acre. The rows should be planted at right angles to the direction of the prevailing winds. (For detail information on this subject, secure Circular 24, Bureau of Plant Industry, U. S. Dept., Agriculture, Washington, D. C.)

**SEEDING:** Sow all seed with a press drill, if possible. From 8 to 12 pounds of seed is enough per acre. Home grown seed or that produced under similar conditions is best. Dry land seed is better than irrigated seed.



Alfalfa can be made a paying crop in West Texas.

Spring seeding is good if weeds can be controlled. On account of weeds, fall seeding on good summer tilled land is producing better results. Do not sow in fall or any other time if the moisture conditions are not favorable.

Do not allow the young alfalfa to go to seed the first year. Clip it with mowing machine the first year to keep down weeds. On an old stand, the second crop is usually the best for seed.

Alfalfa is not a sod crop. In fact, the ground should be cropped and well cultivated for three or four years before sowing to alfalfa. The native grasses will run out alfalfa unless they are thoroughly killed.

## BARLEY

Barley cannot be called a drouth resistant crop, although when there is an abundant supply of early moisture in the soil, it stands a better chance of making a crop than oats. It is very much safer than corn. On account of the altitude and the cool nights of Western Texas, barley is reasonably certain of making.

Barley is not a deep rooted plant. It requires a somewhat more loose seed bed than wheat. The plants are comparatively weak when small and therefore do not do well on weedy land. The seed bed should be well filled with moisture at sowing time.

For West Texas conditions, Winter barley will be found best. It should be sowed in October the same as Winter wheat. Further north the spring variety is best and will often do well in West Texas.

Land for barley should be plowed deeply in July, as already described under "Better Tillage Methods." This will give the ground a good chance to settle and accumulate moisture and thus insure a better stand than could be secured by later plowing.

For best results Spring barley should be sowed shortly after spring oats. It is a good idea to sow it under West Texas conditions, during the first good weather the latter part of January or early February.

Barley should be sowed with a press wheel grain drill at the rate of from 30 to 40 pounds per acre. This will be found to be plenty, especially if the seed is clean and good and the ground has been well prepared.

Seed barley should be treated for smut the same as for wheat. See article on this subject in another part of this bulletin.

Barley is an extra good hog feed. Producing pork of a better quality than corn. It is also a good feed for horses.

## BROOM CORN

Broom corn is a crop that can stand a great deal of dry weather and still make a crop. It often makes a good yield when other crops fail. It requires a short season in which to mature, often making a crop in from two and one half to three months of good warm growing weather.

Broom corn is a good sod crop and often makes an excellent crop on sod without cultivation. It does well on old land also. Like other crops, it responds to good tillage. Old ground is best prepared by fall plowing or early spring plowing. This should be furrowed out at planting time with large sweeps, broad cultivator shovels or by the use of what is known as a loose ground lister. In these furrows that are 3 or 4 inches deep the seed is planted. The ordinary two-row planter is best for this purpose. It covers the seed uniformly and packs the ground around it, insuring a good stand.

There is no question but that Broom Corn is adapted to Western Texas conditions and can be made a profitable crop. Considerable experience is required to properly handle this crop and for this reason, the beginner should not try to raise it on too large scale at first. One fourth of a ton per acre is a good crop.

On account of the limited demand for this crop and the small annual



production as compared with other crops, the price varies and is not dependable. Because the price is high one year, is no indication that it will be high the following year.

Of the two varieties grown; Dwarf and Standard, Dwarf is best suited to our conditions. It is easier to harvest, costs less to handle and is better adapted to Northwestern Texas conditions. Its short, erect growth makes it easy to pull.

There is perhaps no other crop in the Southwest that needs improved seed more than broom corn. When the grower stops to consider that one bushel of seed will plant at least 20 acres, he should not hesitate to pay \$1.00, or even \$2.00 per bushel, if necessary, for it.

The same cultivation is required for this crop, as for kafir or maize. On account of a great deal of labor being required to harvest this crop, it is usually advisable to prolong the planting season somewhat, and not plant it all at once.

## COTTON

Cotton will stand a great deal of dry weather. If the seed bed is well filled with moisture at planting time, so the plants can get a good start, very little moisture thereafter, together with good cultural methods, will make a crop.

It is true, the yields have been low, but when the average cultural methods, as well as the ordinary mixture of seed, is considered, the yields have been remarkably high.

Santa Fe cotton demonstration work in Northwest Texas, above the Cap Rock during 1911, has proven beyond any question of doubt, that the yield can be increased one third by using better seed and better tillage methods.

Many of our cotton raisers in Western Texas, as well as in other sections, certainly believe the "old story," that cotton must be planted on hard ground. It seems that they have heard this and practiced it so long that they are almost afraid to plow cotton ground at all. While it is true, that the seed bed should be firm and that the tap root should have a chance to enter the hard ground, there is no crop that will respond better to good tillage methods than cotton.

**PREPARING SEED BED:** For best results the seed bed should be prepared deeply in the fall or very early spring as described under "Better Tillage Methods." If the ground cannot be plowed at this time, it is a good practice to open it up with the ordinary lister or so-called "Middle Buster," as early as possible, harrowing or cultivating the ridges partly down and letting them lay until planting time. It may be advisable to harrow these ridges once, or twice more before planting time, especially if the weeds start or crusts begin to form. At planting time these ridges should be split by making a comparatively shallow furrow. If the ground has been plowed early, then at planting time make shallow furrows with lister or large sweeps.

It pays to open a very narrow trench in the bottom of the furrow in which the seed should be dropped. This little trench should not be over

one and one half inches in width and about that much in depth. The seed should be covered very shallow in this trench. The dirt should be packed over the seed with a little roller or drag of some kind. There is nothing that will help more to produce a uniform stand, than this packing process.

**SEED:** The average cotton seed ordinary planted in this section is very badly mixed and needs improving. The writer has counted four and five different varieties and mixtures of cotton plants growing in the same row. These mixed plants mature unequally; the bolls open at different times; some of them are storm proof while others blow out easily; the staple is mixed and is of poor quality; a crop of this kind is slow and hard to pick and to make matters still worse, the lint must be sold for less than the average price.

The value of good seed was clearly demonstrated with Santa Fe cotton co-operators above the "Cap Rock," in 1911. While nearly 700 acres was in demonstration, about 500 acres was in Mebane Triumph, which according to collected reports, show the following results:

1. Average yield of demonstration cotton was 1-2 bale per acre. (This is an average from 37 reports, which gave complete statements. Several other incomplete reports where co-operators failed to keep record of yields, could not be included.)

The average yield of other cotton, not under demonstration on the same farms, was 1-3 bale per acre. (Nearly all co-operators applied about the same tillage methods to all cotton on their farms, so this difference of 33 per cent is largely due to better seed.)

2. The average per cent of lint to seed cotton under demonstration was nearly 36 per cent. (The per cent of lint varied from 32 to 38.) (33 per cent for ordinary mixed cotton is very good.)

3. The Mebane Triumph variety proved to be as early as any in the territory.

4. It was more storm proof than the other cotton.

5. The majority of the co-operators claimed that they could pick two to four times as much of the Mebane Triumph as any other variety they raised in 1911.

6. The staple was better than the mixed cotton and therefore commanded a higher price.

The Mebane Triumph cotton can certainly be well recommended for Western Texas. It is to be hoped that all cotton growers of this section, will adopt this variety. The time should be close at hand, when one good standard variety will be all that is raised in a section.

One 1911 co-operator recently made the following statement: "My ten acres of demonstration Mebane Triumph cotton produced over 4-5 of a bale per acre in 1911, while the other 65 acres not in demonstration, produced only 1-3 of a bale per acre." This demonstration cotton made him a net profit of \$36.70 per acre, after paying all expenses for preparing the ground, picking and ginning.

Another co-operator stated that from nine acres of demonstration Mebane Triumph Cotton in 1911 he gathered five bales.

One-half bushel of seed was planted per acre on practically all of the demonstration plats. This amount proved to be more than was really necessary. One bushel per acre, the amount planted by many growers, is too

much, unless the stand is chopped or thinned very much. The comparatively thin stands produced best yields in 1911. From April 1 to April 15 is about the best time to plant cotton in West Texas.

**CULTIVATION:** The seed bed should be thoroughly prepared before planting. Cultivate deepest in the beginning and shallower as the roots begin to spread. Do not cultivate less than two and one half to three inches deep at any time. Cultivate often. Do not stop cultivating for dry weather. A cotton crop that appears to be suffering for lack of sufficient moisture, can be revived by cultivation. Small shovels are preferred for first cultivations and sweeps for later work, although either will do good work for the entire cultivation period.

## GOVERNMENT DEMONSTRATION

The following results of U. S. Department of Agricultural demonstration work in cotton in 1911 in Tom Green County, shows conclusively what the right methods of tillage will do with the crop.

This work was carried out under the direction of field agent J. W. Butcher of San Angelo.

327 acres of demonstration cotton yielded 493 pounds of seed cotton, per acre, the average yield of other cotton on the same farms not under demonstration was 223 pounds seed cotton per acre.

This shows a net gain of 88,410 pounds of seed cotton on the 327 acres or a gain of 121 per cent in favor of the demonstration cotton.

The net gain of 88,410 pounds of seed cotton valued at a minimum price of 3 cents per pound shows an increased valuation over other lands of \$2,652.00 on 327 acres or \$8.10 per acre.

It must be remembered too, that these results were produced in a very dry season, when many of the other crops failed.

It is hoped that this government demonstration work will continue in this section and that many of the farmers will take advantage of it this year.

## CORN

On account of the uncertainty of the corn crop, it is not advisable to grow it to any great extent. Corn is not "King of Crops" here. Often this crop will make an extra good yield, but it cannot be relied upon. There are several factors against this crop. It cannot stand long spells of dry weather; hot winds often damage or ruin it; the corn ear worm and other insect pests are fond of it and finally to "cap the climax," there are other good crops like kafir and milo maize, practically sure of making, that are equally as good.

Some of the best varieties for this section are: Hickory King, Bloody Butcher, Squaw, several of the early Yellow Dents and June Corn.

## EMMER AND SPELTZ

Nearly all of the so-called Speltz of this country is nothing more than Emmer. There is a very close resemblance between the true speltz and emmer and often one is mistaken for the other. The true emmer has a short pointed pedicel or very short stem attached at the base, while Speltz does not have it, but speltz usually has a pedicel or short stem attached at the side. In feeding value there is very little difference between these two crops. Emmer is the best yielding crop and can therefore be recommended as superior.

Farmer's Bulletin No. 466 of the U. S. Department, of Agriculture in discussing emmer says, "Emmer grain is somewhat similiar to that of speltz, but is usually harder, more compressed at the sides, and redder. Emmer is a more hardy plant than speltz in every way. Almost all varieties of emmer are considerably resistant to drouth, and certain varieties are very resistant to rust, moreover, emmer is a crop adapted to general conditions, more so than other cereals. Fall sown varieties are also quite winter hardy. Emmer will produce a fair crop under almost any condition of soil and climate, but thrives best in a dry prairie region with hot summers, where it gives excellent yields." Both the winter and spring varieties of emmer are successful. Speltz is a spring crop.

Winter emmer is sowed about the same way and at about the same time as winter wheat. The ground should be prepared as described under "Summer Plowing" in "Better Tillage Methods." Black winter emmer and Improver winter emmer are good winter varieties.

Spring emmer and speltz should be sowed with a press drill immediately after oats sowing time. From 30 to 40 pounds of good well cleaned seed per acre, is enough.

In various feeding experiments, Emmer and Speltz have been found nearly equal to barley and oats for sheep, cattle and horses. They are excellent horse feeds and will take the place of oats.

Emmer will stand more drouth than oats and will also out-yield them. The yield varies from 20 to 60 bushels per acre. The standard weight varies from 40 to 42 pounds per bushel.

Mr. H. S. Hatchett, Tahoka, Tex., produced between 20 and 30 bushels of Spring Emmer in 1911. (The yield is estimated, as the thresher was not equipped for threshing it and left a large part of it in the straw.) Mr. Hatchett speaks very highly of its feeding value.

Another reliable farmer states that he considers speltz a very good crop for his section. He has produced an average yield of 40 bushels per acre for several years. He says, "I think Speltz is a stronger and better horse feed than oats, if properly fed."

## KAFIR CORN AND MILO MAIZE

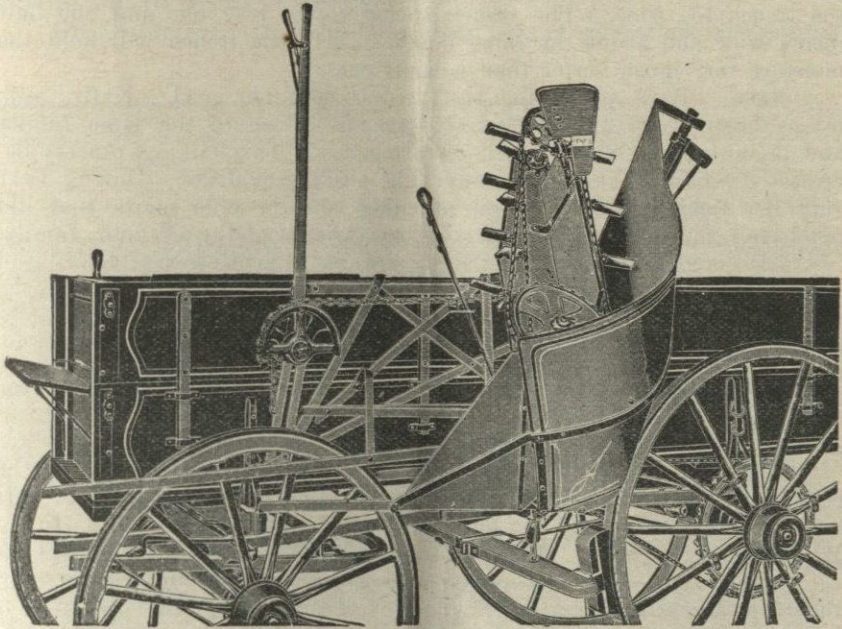
These crops must be to Northwest and Western Texas, what corn is to East Texas, Iowa, Illinois and other states. They are very close competitors to corn. In fact, they are superior in feeding value to the corn that is produced in this section. The feeding value of the

grain of milo maize is about equal to the grain of kafir. Again, the grain of kafir, according to various feeding experiments, is 90 per cent as good as the best grade of corn.

Every farmer likes to raise corn, it is a fine crop to handle and feed, but it is not "King of Crops" here, it must give way to the *more certain* crops, kafir and milo maize.

**DROUTH RESISTANT:** Kafir and milo maize can be considered as our most drouth resistant crops. Milo maize is more drouth resisting than most kafir. In times of extreme drouth this wonderful plant will "cell its sap," that is, it holds its moisture within its stalk, stops growing and waits for rain. If more moisture comes during the growing season, this crop starts growth again and will still make a crop if not killed too soon by frost.

Kafir cannot "cell its sap," as well as milo maize and also requires a longer season in which to mature, on account of this it often



Kafir wagon box header. This will head one row as fast as team walks. (Courtesy of Eagle Mfg. Co., Muskogee, Okla.)

fails when milo maize makes a crop. Any ordinary season, kafir will out-yield milo maize, but it cannot be depended upon for every season, like Dwarf milo maize. Kafir is very much better for fodder and ensilage than milo maize.

**SEED BED:** The seed bed for these crops should be as carefully prepared as for any crops grown. It is true, that both of these are good sod crops and often make good yields with little preparation and no cultivation, yet they respond to good tillage as much as any crops. The ground

should be thoroughly and deeply prepared, either by plowing or listing as described under "Better Tillage Methods."

The writer's experience shows that it pays to plant these crops in shallow furrows on ground that has been plowed and in medium deep furrows when listed.

**PLANTING:** Best results come from planting in furrows with the common two row planter. Under this method the furrows are made with lister or large sweeps and the planter follows closely, planting two rows at once. The planter covers the seed and packs the soil better than the lister attachment, thus insuring a better stand. If the ordinary lister attachment is used some method should be devised for packing the dirt directly over the seed which makes it come up better. This packing can be done with packer wheels, a small roller or drag.

**SUB-SOILER NEEDED:** A little trench should be made in the bottom of every furrow in which the seed is dropped and covered. The ordinary lister sub-soiling attachment will not do the work satisfactorily, as it makes the trench too wide. The trench should not be over one and one half inches wide and about the same depth. This little trench will hold the moisture very much better than a wider one.

**SEED:** Here again, the best seed is none too good. Kafir, milo maize, broom corn and the sweet sorghums belong to the same family and therefore mix when grown close together. This mixing process decreases the feeding value and lowers the yielding qualities. During 1911 very few fields could be found of either kafir or milo maize that did not have a mixture of from one to three varieties of the sorghum family.

After a good seed has been secured, it can be kept up to standard and often improved by selecting only the best seed heads from the field each year. These should be stored in a good dry place over winter and not to be threshed until about planting time the following season. In this way, only the best seed that was produced is planted.

## VARIETIES

Black Capped White Kafir, also called Black Hulled White is the common and best variety. This is a good yielding and marketing type. It requires somewhat longer season than the Red Kafir or the White Hulled White Kafir.

**RED KAFIR:** This variety requires a shorter season to mature than the Black Capped White, but does not yield so well and the seed shatter badly.

**WHITE CAPPED WHITE:** This has a white hull or white cap at the base of each kernel instead of a black one, as is found on the Black Capped white variety. This variety matures in a shorter season and stands slightly more dry weather, but it is like the Red Kafir in that it is a light yielder and shatters badly.

**MILO MAIZE:** There are two common varieties of Yellow or Red Milo Maize, *Standard* and *Dwarf*. The *Standard* variety is large and late maturing and is not as certain of maturing as the *Dwarf*. *Dwarf* milo maize is the common variety and can be safely recommended as better than *Standard*.

**WHITE MILO:** It is a very promising variety now being extensively grown in this part of the state. It is a heavy yielder, very drouth resistant

and about ten days earlier than the ordinary Red Dwarf Maize.

**CULTIVATION:** Kafir and Milo Maize require similiar cultivation. The first two or three cultivations should be done with the ordinary harrow. If the crop was planted with a lister, the lister cultivator, or "Go-Devil"; will do good work once or twice after the harrow. Later cultivation should be done with sweeps or small shovels. As with other row crops, the deepest cultivation should be done during the early stages, followed by shallower work later. See table for recommended space for these crops.

**YIELDS:** The following yields show comparison of Santa Fe demonstration corn, kafir and milo maize in 1911, above the "Cap Rock."

Corn, average yield per acre, 7 best reports, 22 bushels. (These yields varied from 8 to 45 bushels per acre and many fields failed entirely.)

Kafir, average yield per acre from all reports, 28 bushels.  
(No failures and all reports included.)

Milo Maize, average yield per acre from all reports, 26 bushels. (No failures and all reports included.)

On account of milo maize being more certain of making a crop than



A 1911 Kafir field in Northwest Texas, estimated yield of this part of field was over 50 bushels per acre.

kafir, we recommend that every farmer raise some of both crops. Usually it will be advisable to divide the acreage of these two crops about equally.

Again on account of these and other crops, like broom corn and sweet sorghums, being closely related and easily mixed, there should be some space, (which may be planted to other crops,) between the fields. This space will prevent mixing, insuring better seed and more salable crops.

## MEXICAN BEANS

Mexican beans are a paying crop for Northwest and Western Texas. They will stand as much, if not more, dry weather than milo maize or emmer. The yield will vary from 300 to 700 pounds per acre and the wholesale selling price ranges from four to six cents per pound, thus making them a good cash crop.

On account of the short season in which this crop will mature, they often produce extra good yields following a small grain crop, especially if the moisture conditions are favorable.

The ground should be prepared early and deep as described under "Better Tillage Methods." It should be kept in a good state of cultivation until planting time. The beans will not stand any frost and do not do well until the ground is thoroughly warm, for this reason they should not be planted before cotton planting time.

It is often a good plan to plant Mexican beans and cotton in alternate rows, a row of beans and then a row of cotton. The crop of either is often as large as if only one crop was raised and the beans improve the fertility and physical conditions of the soil.

It is a good plan to plant Mexican Beans in shallow furrows, in well prepared plowed ground. The rows should not be closer than 3 1-2 feet with the plants from 12 to 18 inches apart in the row.

Cultivation with sweeps or small shovels should begin as soon as the beans are up, this should be continued until pods form, and later, if the plants are not disturbed or damaged. They should not be cultivated when the vines are wet, as it often injures the plants and makes them subject to bean diseases.

As soon as the beans are thoroughly ripe, the vines should be pulled and piled for curing. In order to save them from blowing over the field and threshing themselves out, it is a good plan to pile them around a stake that has been driven into the ground. They should be threshed out soon after pulling.

If they are raised on a small scale, hand threshing in a tight wagon box is preferred, but if handled on a large scale, they must be threshed with an ordinary thresher which has been equipped with special bean concaves.

## OATS

Oats may be considered as a good fall or spring crop for Western Texas, especially if the moisture conditions are favorable at sowing time. If the ground is not filled with deep moisture by sowing time, or before, the advisability of sowing oats in the spring is questionable. The root growth and stooling of oats must take place during cool weather and under favorable moisture conditions. If a spring crop of oats is not well started before warm weather comes on it does not stand a good chance of making a large yield.

PREPARATION OF GROUND: Oats, like most other crops requires good tillage. Early summer plowing for fall oats gives best results. Fall



plowing is much more favorable for spring oats than spring plowing. Deep plowing for oats must be done for considerable length of time before sowing. Oat land must be well settled.

Ground that has been plowed deeply the year before and has been kept in a good state of cultivation may be fairly well prepared by double discing. If the ground cannot be prepared for considerable length of time before sowing, plowing is not advisable unless done very shallow and in this case the disc harrow will do equally as well.

Land that has been summer tilled is in excellent condition for winter oats.

**WHEN AND HOW TO SOW:** One great trouble with our oat sowing so far has been that they have been sowed too late or on poorly prepared



A 1911 oat field in West Texas that averaged 60 bushels per acre. Result of deep plowing and good tillage methods.

land. Winter oats should be sowed deeply between September 15th and October 15th. Early sowing gives the root system time to get a good start before cold weather. All spring oats should be sowed on well prepared land during January or early February.

All oats do best when sowed with a press drill. Experiments and demonstrations show that drilled oats often yield from eight to ten bushels more per acre than those that have been broadcasted on top and harrowed in. In drilling less seed is required and a better stand is insured. Our winter oats should be sowed deep, from three to four inches in depth.

**SEED:** Oat seed "runs out," that is, it gets poorer and poorer unless special care is taken to sow only the best. Ordinary "bin run" seed should not be sowed until after being run through a fanning mill or grain grader. Only the plump, well filled seed should be sowed. By doing this every year, the seed will improve instead of running out, and the yield will continue to become better.

Every farmer who desires to raise oats should get started with good seed and then use the fanning mill to keep it good.

**VARIETY AND AMOUNT TO SOW:** Texas Red Rust Proof and Winter Turf oats are well adapted to west Texas conditions. Owing to the fact that oats stool a great deal in this section, much less seed is required per acre than under Eastern and Northern conditions. One bushel to five pecks per acre of good well cleaned seed is enough, especially if the seed is sowed with a grain drill on well prepared land.

It is often advisable to sow oats in the fall with a one-horse drill between the cotton rows, especially if the field has been well cultivated and the moisture conditions are favorable. The cotton stalks can be rolled or harrowed down later with good effect to the oat crop. In fact, we recommend that both winter and spring oats be rolled or harrowed two or three times during the growing season. A corrugated roller is better for this purpose than the smooth roller. The corrugated roller firms the ground around the roots and improves the soil conditions. Harrowing will kill weeds, save moisture and insure larger yields. The ground must not be allowed to get too dry before harrowing as dry ground often pulverizes too much, thus making it liable to blow. Harrowing should be done after a rain, just as soon as the ground gets dry enough.

All seed oats should be treated for smut, the same as wheat or barley. For methods of treatment see directions in another part of this bulletin.

## PEANUTS

Spanish peanuts will stand a great deal of drouth. If the crop gets well started, it will stand as much dry weather as milo maize. While peanuts in general, are a warm country crop, demonstrations the past three or four years have proven conclusively that the spanish variety, at least, can be depended upon throughout practically all of Northwestern and West Texas. Even the so-called "Jumbos" produce very good crops in some sections.

Spanish peanuts will mature in from 90 to 100 days, under favorable weather conditions. Ordinarily the peanut is considered as a loose or sandy land crop, but with good tillage methods, it does well even on the hard or tight lands. Very favorable reports were collected for the season of 1911, from as far North as Hemphill County, and from practically every county on a line with Hemphill and South thereof. The Spanish variety is best adapted to the entire section. They will produce well with a limited amount of moisture. They are easy to cultivate on account of their erect growth and they are easy to harvest from the fact that the nuts adhere well to the vines.

**THE SEED BED:** Early deep plowing is to be recommended, fall plowing preferred. Spring plowing must necessarily be shallower than in the fall. All peanut land should be worked enough in the spring to keep down all weeds and to save the moisture until planting time. It is advantageous to kill two or three crops of weeds on the ground before planting time.

If plowing cannot be done at the proper time, listing is often practiced with good results. The ground should be single listed early and the ridges should be harrowed down somewhat, two or three times before

planting. At planting time these remaining ridges should be split with lister and the peanuts planted immediately after.

**PLANTING:** This is best done in sweep or lister furrows with a regular peanut planter. On the small scale the nuts may be dropped by hand. Sometimes two seats are arranged on a riding lister, one for the driver and another behind, for a man who drops the nuts from a box, through a tube, to the furrow. It is almost impossible to make an even distribution however, with this last method. The rows should be about 3 1-2 feet apart. Peanuts will not stand frost and should therefore, not be planted until all danger is past. May 1st, may be considered as about the right time, especially for the middle part of the territory.

**SEED:** One bushel of good, unshelled nuts is enough per acre, especially if the ground is well prepared and the seed is evenly distributed. The stand is good when plants are from 12 to 15 inches apart in the rows. The nuts are usually not shelled.

Prof. McKnight of the Texas A. & M. College recommends soaking them as follows to prevent them being taken out by mice, squirrels, etc., "Soak the whole nut for 24 to 48 hours in water to which has been added a kerosene emulsion made as follows: Shave fine a one pound bar of ordinary laundry soap, and add one gallon boiling water. Stir vigorously for ten minutes, then add one-half pint of coal oil and stir another ten minutes. Pour this liquid into enough water to cover one bushel of peanuts. Let them stand in this water for 24 to 48 hours, when the water may be drained off and the peanuts planted."

**CULTIVATION:** Cultivate frequently with sweeps or small shovels, keeping the ground as nearly level as possible, until about the last cultivation, at which time it is usually advisable to ridge slightly with a wide ridge. Care should be exercised not to injure the plants during the last one or two cultivations.

**YIELD AND VALUE AS A HOG FEED:** The following actual results of returns and experiences of various farmers in the Panhandle in 1911, are of value:

Mr. H. G. Shaw of Clarendon, Texas, makes the following brief remarks, "I do not know of any feed better adapted to hogs than peanuts. I pastured about 20 acres of Spanish peanuts in 1911, and although I did not have one half stand, valueing pork at 5 cents per pound, I realized \$25.00 per acre, and the hogs gathered them. I am satisfied with a good stand of peanuts, I could have procured from 850 to 1000 pounds of pork per acre, I am now gathering 15 acres of peanuts, not pastured, by pulling vines, nuts and all for winter hog feed. These are put up in the form of hay and make an extra good winter feed. They are especially valuable when run through a grinder, vine and all."

Mr. D. W. Clampitt said, "I pastured during the fall of 1911, twenty-five 200 pound hogs and twenty 75 pound hogs, for thirty days, on three acres of Spanish peanuts, without anything else. I find no waste to this crop when hogs are allowed to gather it. I expect to go into peanut raising, for hogs, still heavier, in 1912. What peanuts we gathered during the fall of 1911, made about 45 bushels per acre."

Mr. D. H. Zachery states, "I have been here twenty years and have never seen peanuts fail. For hog feed, they can't be beat. I had 21 acres

of peanuts in 1911, that I planted for my ninety hogs. I believe in peanuts strong enough that I am going to plant 50 acres in 1912. For pork production, peanuts give me far more returns than any other crop I know of."

Mr. W. J. Black states, "I raised 20 acres of Spanish peanuts in 1910, for hog feed. It was by far the most valuable 20 acres on my farm. I was so well pleased with the results that I increased the acreage to 60 in 1911. For hogs, I know that an acre of peanuts is worth considerable more than an acre of any other crop I can raise.

## SWEET SORGHUMS

The sweet sorghums belong to the same general family as kafir, milo maize and broom corn. They are equally drouth resistant and require about the same handling. In this section they may be grown for the syrup, for seed or for forage. The seed of these crops is not valuable as a feed. In many sections the seed is raised for seed purposes and is sold as a commercial product.

For seed purposes this crop should be handled almost exactly as kafir or milo maize.

For forage purposes, the ground should be prepared as described under "Better Tillage Methods." The seed should be planted with a press drill at the rate of from 40 pounds to one bushel per acre. The sweet sorghums will not do well until after the ground becomes thoroughly warm. They should therefore, not be planted until some time after kafir planting time. For forage purposes, sorghum should be cut before it gets overly ripe.

**VARIETIES:** There are two common varieties of sweet sorghums that will do well here, the sumac and amber.

The Sumac sorghum is a late growing, heavy producing variety, it is very sweet and makes excellent forage.

The amber is an early variety and stands a great deal of dry weather. It is not a heavy forage yielder, but a good seed producer. On account of its early maturing qualities, it is adapted to many sections.

Either the Sumac or Amber sorghums are good seed producers, and often make good cash crops, if grown for the seed only. The sweet sorghums make good sod crops. When grown for seed purposes, these crops often produce large enough net returns in one year to pay for the land on which they grew.

**DANGER IN PASTURING:** Cattle often die as a result of sorghum poisoning. There are four stages or conditions that often develop in a sorghum field that are likely to kill cattle, if pastured: (1) When it is very young. (2) When stunted by dry weather. (3) Second growth crop, and (4) frosted sorghum. Kafir under similiar conditions is also dangerous.

No treatment that will cure is known excepting not to pasture under conditions named. Even if there was a remedy for the poison, there would not be enough time to use it before death would take place.

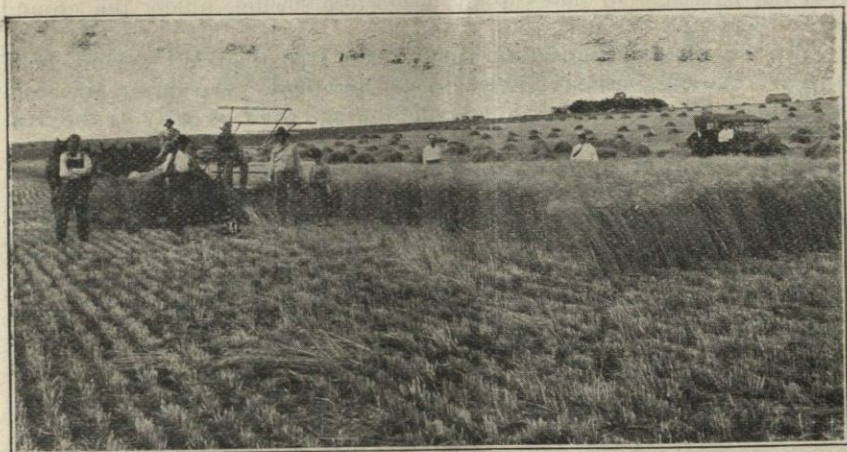
The poison developed is nothing more than the deadly poison, prussic acid.

## WHEAT

**WINTER WHEAT:** Winter wheat will be a success in this section only when our farmers learn to thoroughly prepare the seed bed early and deep. While wheat is a crop that requires a firm seed bed, it will not do well in ground that has not been plowed or pulverized in some way.

The seed bed should either be prepared by "Summer Tillage" or as described under "Summer Plowing" in "Better Tillage Methods." The longer before sowing time that the ground is prepared, the better.

**RESULTS OF TILLAGE METHODS:** The following data on results of tillage methods on wheat in 1911, on the Kansas Agricultural Experimental Farm, as quoted in part from Bulletin No. 176, of that station, can be well applied to our conditions.



Harvesting the 1911 crop of wheat on a West Texas farm.

Land plowed July 15th, (the right time) seven inches deep, (the right depth,) gave a yield of 38 1-3 bushels per acre. After paying for the cost of preparation, there was left \$25.74, per acre.

Land plowed July 15th, three inches deep, (plowed at the right time but too shallow,) produced 33 1-3 bushels per acre, a net return of \$22.32.

Land plowed August 15th, seven inches deep, not worked until September 15th, showed a yield of 23 2-3 bushels per acre and a net return of \$15.34, per acre, after deducting the cost of preparation.

Land plowed at proper depth, seven inches, September 15th ((too late) produced 15 3-4 bushels per acre and gave a net return of \$9.08, per acre.

Land plowed three inches deep (too shallow) September 15, (too late) gave a yield of 14 1-2 bushels, a net return of \$8.52 per acre, after deducting cost of preparation.

Land disced but not plowed, cost \$1.95 per acre for preparation and produced 4 1-4 bushels per acre, the crop when sold returned \$1.47 per acre over the cost of preparation of ground.

A careful examination of the above statements will show an in-

crease in wheat yield from 4 1-4 bushels to 38 1-3 bushels per acre, due wholly to differences in methods of preparing the land before seeding. This difference actually being 34 bushels per acre.

**SEED AND SEEDING:** If the seed has been thoroughly cleaned and is of a good variety, 30 pounds or one half bushel is enough per acre. If the seed is sowed late, after November 1st, a little more will be needed.

Winter wheat should be sowed between September 20th and November 1st, however, good results often come from later sowing. Sow with a press drill. Treat all seed for smut as described elsewhere in this bulletin.

Turkey Red and Kharkof varieties are best for winter seeding in this section.

**SPRING WHEAT:** Spring wheat does well in this section if the ground is well prepared. The ground should be plowed early and deep. It is often not advisable to plow at all just before sowing, unless the ground can be thoroughly packed.

Spring wheat will require slightly more seed than fall sowing, from three pecks to one bushel. Treat the seed for smut. Durum or Macaroni varieties are the most certain for spring sowing. Sow as early as the weather conditions will permit.

**HARROWING WHEAT:** Both winter and spring wheat should be harrowed, unless there is too much danger of blowing. Wheat like row crops, needs cultivation to break crusts and open up the soil. A great deal of good is done by harrowing even if it looks like much of it is being torn out. The yield can usually be increased by rolling winter wheat, preferably with a corrugated roller. If a smooth roller is used the ground should be harrowed lightly immediately after rolling.

## **“FORMALIN TREATMENT” TO PREVENT SMUT IN WHEAT, BALEY AND OATS.**

There are two kinds of smut affecting wheat, barley and oats. Loose smut and stinking or ball smut. Both can be prevented by treating the seed and rotating the crops. The spores of both kinds are carried by the seed, but the spores of loose smut may also be carried in the soil from one year to another. Treating the seed prevents stinking smut, but loose smut requires that the seed be treated and that the ground on which it grew be planted to another crop the following year. The stinking or ball smut is the kind most commonly found. It destroys the kernels only, while the loose smut destroys the grain and chaff entirely, and the sooty mass of spores remain. The stinking smut gives off an offensive odor when broken.

The following “Formalin Treatment” will prevent stinking smut in wheat, also the smuts which commonly affect barley and oats.

Secure a 40 percent solution of formalin at a reliable drug store. As soon as the seed is ready, mix a one pound bottle of the formalin with 40 gallons of water and begin operations. The seed may be treated as follows:

Prepare a clean place on a canvass or smooth floor. Thoroughly sprinkle the place with the solution before spreading the seed on it. Sprin-

kle the spread out seed and at the same time shovel it over. Continue to sprinkle and shovel over the seed until it is thoroughly moistened. Next, shovel the seed into a pile and cover with sacks or blankets for two hours, after which it should be thoroughly dried before sowing. If the seed can be sowed at once, drying will not be necessary, but more seed will be required on account of the swelled condition. Do not allow the seed to remain wet too long after treating, as the germinating qualities may be injured.

Place the dried seed in sacks which have been dipped in the solution. It is also advisable to sprinkle the grain drill with the solution before using it. Exercise every precaution not to bring the treated seed in contact with any that has not been treated. The seed should be treated but a short time before sowing.

## MORE DAIRYING NEEDED

The grain farmer who does not handle live stock to consume the greater part of his products, is unconsciously selling his farm in the form of grains and other crops. When he sells a ton of wheat he is disposing of \$8.35, worth of soil fertility. In selling a ton of corn, milo maize or kafir corn, he is disposing of about \$6.50 worth of soil fertility.

Dairying produces a constant and sure income. It cannot be considered as an easy road to wealth, but it is a sure road to agricultural prosperity. It enables the farmer to use unsalable foddors and farm materials, converting them into milk and butter which are the highest priced products of the farm.

When the grain and seed crops practically fail and very little is raised besides roughness, the old cow must be trusted to help feed and clothe the family.

**DIVERSIFICATION IN FARMING AND DAIRYING GO TOGETHER:** The farmer who diversifies his crops and then does not depend upon them entriely, but rather grows them in connection with the dairy, poultry and hogs, is sure of his living expenses and a reasonable saving.

Cash crops, such as wheat and cotton, are not reliable enough to depend upon them alone. When they make a crop, they often pay for the land in one year. Another year they may be complete failures and then is the time that the cow can consume such roughness and drouth resistant crops as can be raised and convert them into salable products. We can depend upon the dairy and other live stock, keeping the farm in better condition, preserving its fertility and enabling the farmer to sell his crop in a more concentrated form and for better prices.

**CASH INCOME:** The dairy farmer gets cash for his produce every week, this enables him to buy cheaper, for cash, which gives him the advantage over his neighbor who has something to sell but once a year.

Our most prosperous communities and States are those where livestock is combined with diversified farming. These sections are known by their good farms and well painted buildings. They also have good schools, good roads and farms of high value.

FEEDS: Our range conditions of dairying, without the raising of special crops, suitable to milk production, must necessarily prove largely unsuccessful. We are often told that we cannot raise milk producing feeds in this section, but we can. Kafir and maize fodders are almost as good as corn fodder. The grains of kafir and maize are practically equal to corn, especially in connection with bran. Oats, millet and sorghum hays make good substitutes for hays used in Northern and Eastern States. Cow pea hay is about equal to alfalfa hay, and alfalfa cannot be excelled.

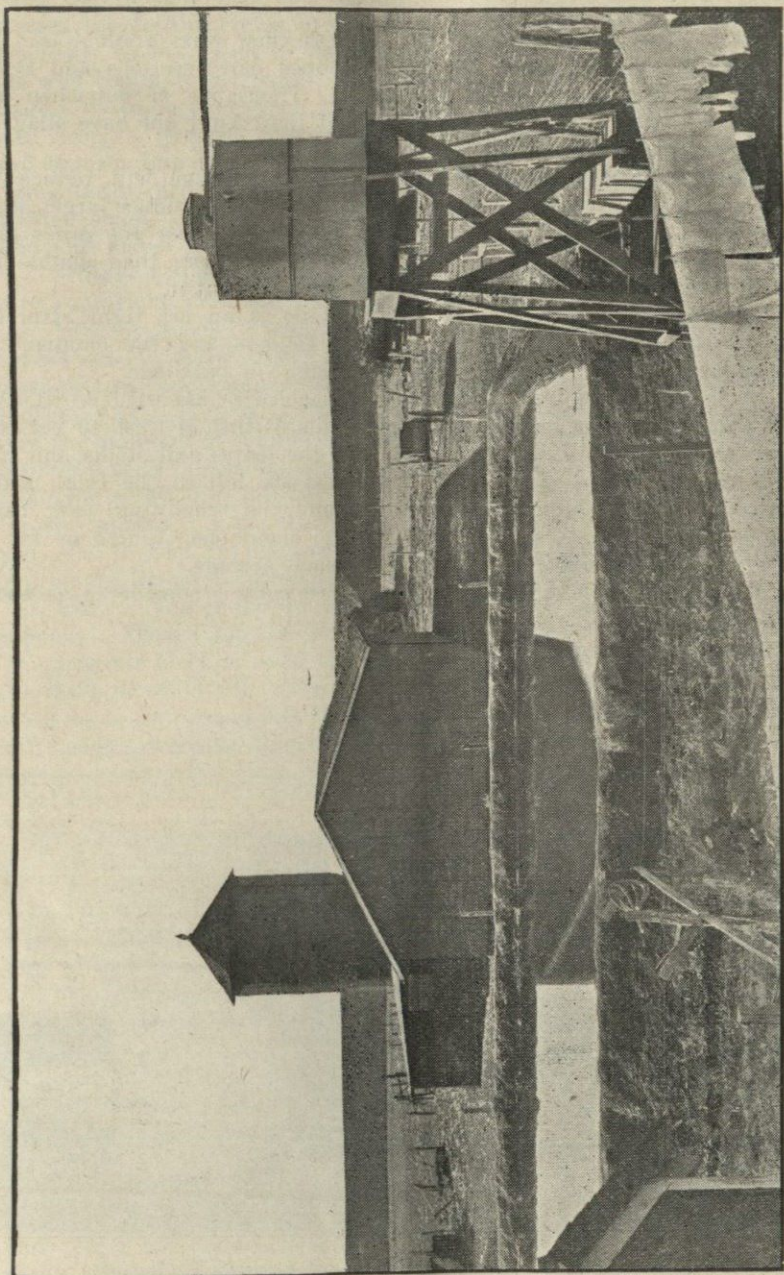
SILAGE AN EXCELLENT FEED: As soon as we learn to use the silo in connection with our dairying, we will have advanced a long step towards success in the industry. We can raise several feeds that are good for silage such as: Corn, kafir, maize, cow peas, etc. Green kafir makes excellent silage. One acre of kafir under our conditions should yield from three to five tons of green fodder, suitable for silage. 50 pounds of this silage makes a good daily ration for a dairy cow. According to these figures, one acre of green kafir will produce enough silage to feed one cow for five to seven months, especially when fed in connection with other feeds. There is no other cheaper or better milk producing feed than silage. It may be fed either in summer or winter. Good dairymen who have had experience with silage consider it indispensable, as they realize the necessity of succulent feed. *Silage places the cow in pasture conditions in January.* It can be stored at less expense than any other feed, ten tons requiring the same space as is needed for one ton of hay.

BETTER COWS NEEDED: To make dairying a success, attention must not only be paid to feeding the herd, but also the class of cows making up the herd. The following three essentials are recognized by all successful breeders of dairy cattle: (1) Systematic records must be kept of individual cows, so as to determine which are profitable and which are *boarders or profitless*; (2) A pure-bred well selected bull is used; (3) heifer calves from the best cows only are kept in the herd.

INCOME: The following figures show the dairy returns of 20 farmers in one neighborhood in west Texas for the year of 1911:

Number of cows milked .....	70
Number of pounds of butter made .....	12712
Number of pounds of butter sold .....	8601
Number of pounds of butter used at home .....	4111
Average selling price of butter per pound .....	25 cents
Total received for butter sold .....	\$2150.25
Value of butter used at home .....	1027.75
<hr/>	
Total value of butter .....	\$3178.00
Value of butter per cow .....	\$45.40
Estimated value of skim milk per cow .....	\$10.00
Estimated value of calf, one year old .....	\$25.00
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Income per cow per year .....	\$80.40





Building equipment of a farmer in Northwestern Texas who practices diversified farming

## THE SILO

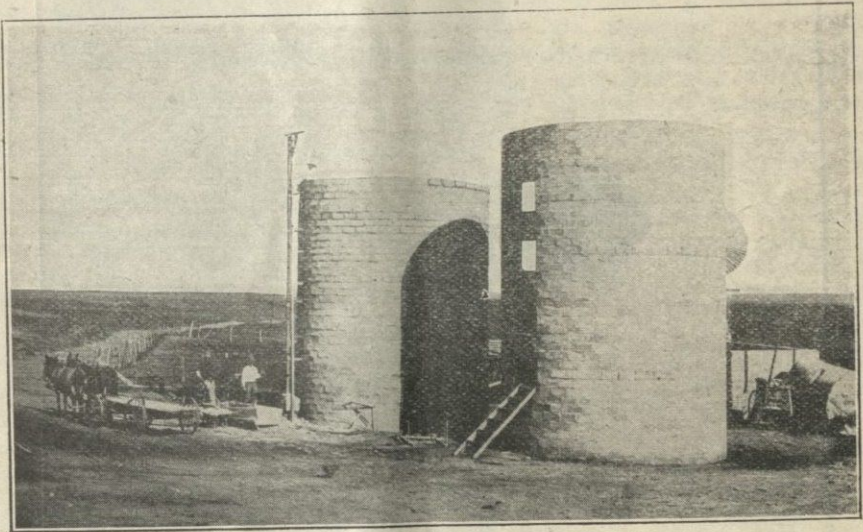
Twenty-five years ago very few farmers knew what a silo was. Today it is almost as common in well developed dairy sections and in diversified farming districts, as are barns. Thousands of dairymen and stock raisers would want to quit business if they could not have silage to feed their stock during the larger part of the year.

Well informed farmers of today know that silage will reduce the cost of all lines of live stock feeding and raising. It will produce larger quantities of milk, beef, mutton, etc., at less cost than almost any other kind of feed. Under the silage method, one acre will more than double the net returns coming from the average single acre, without it.

The reading farmer knows that the silo is an air tight structure used for the preservation of green, juicy fodders and the chopped up feed, as it comes from the silo, is called "silage" or "ensilage."

By the use of the silo, the farmer is enabled to use with profit, that which without it he is losing. Authority tells us that at least 40 per cent of the feeding value of the corn crop is in the leaves and stalks and that 60 per cent is in the ear. When the stalks are left in the field nearly forty cents on the dollar goes to waste and the remaining sixty cents is stored in the crib. Shock fodder will go about one fourth as far in feeding value as the silage coming from the same acreage.

**SILAGE CROPS:** In the North and East corn is considered as about



Good cement block silos under construction, capacity 150 tons each. Approximate cost was \$2.00 per ton capacity. Mr. T. S. Bugbee, of Clarendon, Texas, has four of these.

the only silage crop, but in this section kafir is found to be its equal. Green alfalfa, cow peas and peanuts, chopped and added to the kafir, increases the feeding value of the silage very much. Any of these plants are ready to be placed in the silo just before the plant ripens or before the seed begins to get hard. Kafir is ready when the seed is in the dough stage. With any of these silage crops, the entire plant, including the seed crop, is chopped into lengths of from one fourth inch to one inch and thrown into the silo, where it is packed by tramping and left to the fermentation process until ready to feed. In this green, juicy and fermented stage, stock crave it, and are able to eat the entire plant, stalk, seed and leaves without any waste.

Silage enables the feeder to place all kinds of live stock under pasture conditions in winter months.

**SIZE OF SILO:** From one to two feet of the silage on top of the silo always spoils. After taking this spoiled part off, it is necessary to feed a layer of from one and one-half to two inches daily in order to keep it from spoiling faster than it is being fed. On account of this, it is necessary that the diameter of the silo corresponds to the number of animals to be fed, while the height depends upon the length of time the silage is to be fed. By removing a two inch layer every day, a silo 30 feet high will furnish silage for six months. A silo 10 feet in diameter is large enough for 12 cows, and one 16 feet in diameter is large enough for 30 cows. A convenient height for a silo above the foundation is twice its diameter.

**COST:** Either the concrete or stave silo will cost about \$2.00 per ton capacity. Thus a 150 ton silo of this type can be put up for about \$300.00. The concrete block or solid wall silo is really better for our conditions than the stave or wood silo. The wood silo, unless properly guyed or anchored often racks and sometimes blows down. Careful anchoring and tightening will usually overcome this, however.

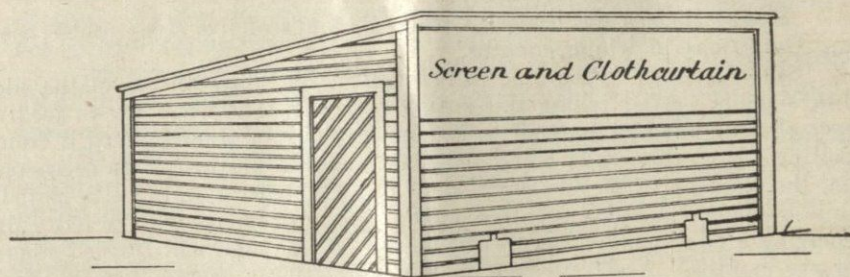
## OUR FARM POULTRY

The bulk of chickens and eggs of Texas are produced by the farmer. Every farmer of limited means should keep from 100 to 500 good laying hens all the time. If they are properly fed and cared for, the eggs alone, will bring in a net return of at least \$1.00 per hen per year.

The poultry business, like any other line of business, requires a certain amount of *intelligent* attention. The farmer who sees no money in the hen, certainly has another look coming. As long as he looks upon her as a necessary evil and a scavenger and lets her take care of herself, very little returns should be expected.

Many of our farmers say, "My hens eat more than they are worth." Usually upon investigation, these unprofitable flocks are found to contain a mixture of breeds, colors and ages. No culling is being done. Old and young are handled alike. A large number of roosters are unnecessarily allowed to overrun the premises. As soon as the hatching season is over, the old rooster should be sent to market. Some of the hens are found to be too fat, others too old and the few that are profitable producers, cannot over balance the losses.

**CULLING NECESSARY:** The first step towards profit in the above described flock is to thoroughly cull it. The flock may have 200 hens in it with only 100 producers. These 100 hens that have been trying to over balance the losses of the 200 flock will make a wonderful showing by themselves. Experts tell us that the average number of eggs laid by the Texas hen in one year is 60. They also tell us that a fair average of a well kept flock should not fall below 120 or ten dozen. In this culling process, keep the hen that produces what is wanted at least cost and by all means get rid of the others.



**A GOOD COMMON SENSE POULTRY HOUSE.**—Dimensions, front wall 7 feet high, rear wall 5 feet high, 16 feet wide, and as long as necessary for the size of flock. House should face South, and where possible, door should be in East end of building. Front to be closed  $3\frac{1}{2}$  feet from bottom, and the upper  $3\frac{1}{2}$  feet covered with one inch mesh poultry wire, also drop curtain of Burlap, light canvas or muslin.

**BREED:** There is very little difference in the laying qualities of many of the best breeds. The number of eggs produced being largely due to the feed and care. It costs no more to feed and care for pure bred stock than scrub stock and the marketing opportunities of the standard breeds are best.

Everything else being equal the smaller breeds will produce eggs at less cost than the larger breeds, although many of the medium sized breeds will lay as many eggs. There is no question but that for average farm purposes the so-called "general purpose" breeds are best. These general purpose breeds not only produce the eggs, but are more valuable from the poultry market standpoint. The best general purpose breeds are, the Plymouth Rocks, (Barred, White and Buff), Rhode Island Reds and Wyandottes, (Laced, White and Buff.)

**FEEDS AND FEEDING:** Farm poultry will pick up a large part of their feed from that which otherwise would be wasted but they should be watched especially when this waste supply is short. Hens like other live stock, require variety. There is nothing better for poultry feed than kafir or milo maize, fed in connection with wheat, oats, barley, millet or alfalfa.

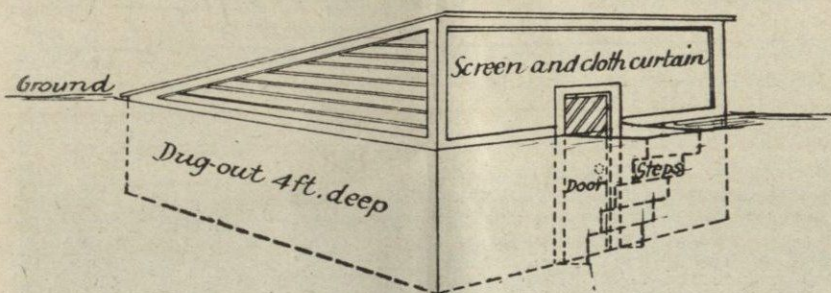
During summer months hens get all the insects and worms they need, these can be supplied in winter months in the form of meat scraps, jack rabbits, skim milk or curd. In addition, poultry should be supplied with grit, oyster shell and charcoal, especially during winter months. The

hens will also do better if supplied with grass, alfalfa leaves, cabbage, ensilage, sprouted grain or anything that is green or succulent.

**WATER:** Hens often decrease in egg production from lack of a good supply of drinking water. The importance of an abundant supply of water can readily be seen when we stop to consider that 65 per cent of an egg is water, as well as 15 per cent of the hen's body. Good, pure, fresh water should be supplied at all times. In winter the water should be warmed.

**HOUSING:** Hens do not require finely finished, double walled or plastered, painted houses, but at the same time "any old shack" with the air coming in from four sides at once, will not do.

A good type of house is shown in the illustration. In this style of house, 500 hens can be housed at once with very little danger of sickness,



**A DUG-OUT POULTRY HOUSE.**—A cheap and practical house, warm in winter and cool in summer. Excavation 4 feet deep, 16 feet wide and as long as desired for the flock, height same as frame house described elsewhere. Door should be in South or front of house instead of East end. Space in front above ground should be covered with 1-inch mesh poultry wire, also a drop curtain of Burlap, canvas or muslin. One-inch mesh wire should be attached to frame of building at ground line in such manner, so as to prevent vermin from getting in.

especially if it is cleaned at least twice a week as it should be. For poultry profit, the "once a year" plan of cleaning house cannot be recommended. All roosts should be placed on the same level, about half way between the roof and floor. In order to use all floor space for the hens, a tight dropping board should be placed about a foot below the roosts.

The house should face the South. The roof, North side and ends should be tight, so there is no chance of draught. A draught on a hen is almost certain to give her roup or some other disease. The curtain or open front house is recommended for this section.

## HOGS

There is no farm animal that will return a profit quicker or with more certainty, upon the feed it consumes and the care given it, than the hog. The hog is always ready to eat almost anything given it, produc-

ing a finished product of high market value. The hog will often consume farm products that would otherwise be wasted. The hog makes more meat from a certain amount of feed than any other farm animal. From four to six pounds of dry matter will produce a pound of pork, but it takes from ten to thirteen pounds of dry matter to produce a pound of beef. Again the hog is the most prolific of farm animals.

**PASTURE:** For best success and largest profits, hogs must have plenty of green feed. This can be supplied by fencing five or six small fields for pasture. In these something should be kept growing a large part of the year and the hogs must be pastured on first one field and then the other, to suit the conditions. In one of these fields plant oats, early, in another plant sorghum, later follow these with maize, cow peas and peanuts. Alfalfa makes an extra good permanent pasture and should be grown by every hog raiser. For late fall and early spring pasture, rye cannot be excelled.



Alfalfa makes an excellent hog pasture. Hogs will handle Spanish peanuts and milo maize profitably, in the same way.

A patch of Spanish peanuts, allowed to mature, makes excellent feed for finishing a bunch of hogs in the fall. Hogs fed plenty of green feed during the summer can be finished for market by turning them into the peanuts, allowing them to root them out for themselves. There is no better winter feed than peanuts, which have been pulled, cured and stacked. Alfalfa, cow peas or soy bean hays will supply a valuable part of a winter ration. (See article on "Spanish Peanuts" elsewhere in this bulletin.)

**GRAIN FEEDS:** Kafir and milo maize are practically equal to corn, in feeding value. Hogs do well on either of these feeds, if fed whole, but better results are usually obtained by cracking or soaking the grain. Wheat is equal to corn, taking equal weights, in fact, hogs will do better on wheat alone than on corn alone. Wheat and kafir or maize, mixed gives excellent results. Barley is also an excellent feed.

**KIND OF HOGS TO RAISE:** There is no "best breed", one that is best for all conditions and surroundings. There is only an occasional farmer that can afford to breed and raise fancy hogs. The majority of hog raisers must raise them for the general market. The market type most in demand today is a young animal of compact, smooth form, which has been quickly grown and does not weigh more than 200 to 250 pounds.

The Durocs, Berkshires and Poland Chinas, answer very well for a "best breed." The Duroc breed being of excellent type, prolific and good mothers. The average number of pigs to each litter being a little over nine. The Poland China breed is the most popular in the corn belt. They possess early maturing qualities. As a breed they are criticised somewhat on account of producing small litters. The Berkshires are usually classed as a "lard hog" type. They usually produce medium sized litters and suckle them well. In style and finish the Berkshire ranks high. It is symmetrical in form and attractive in make-up.

**THE BROOD SOW:** The strong, vigorous sow producing and successfully raising seven or eight pigs at a litter has more than double the value of the sow which will produce and raise but four. Discard all old sows that have produced the small litters and those that have been poor sucklers or are cross and nervous. A tried sow that has fulfilled all the requirements is worth keeping for several years.

In selecting a gilt, for breeding purposes, take one from a large thrifty litter, and one that has a mother of the desired qualities. The gilt most likely to make a good brood sow will be well developed and strong, of good length, good heart-girth, broad between the eyes and standing on good legs and feet. The gilt should be allowed to grow and develop until she is a year old before breeding her.

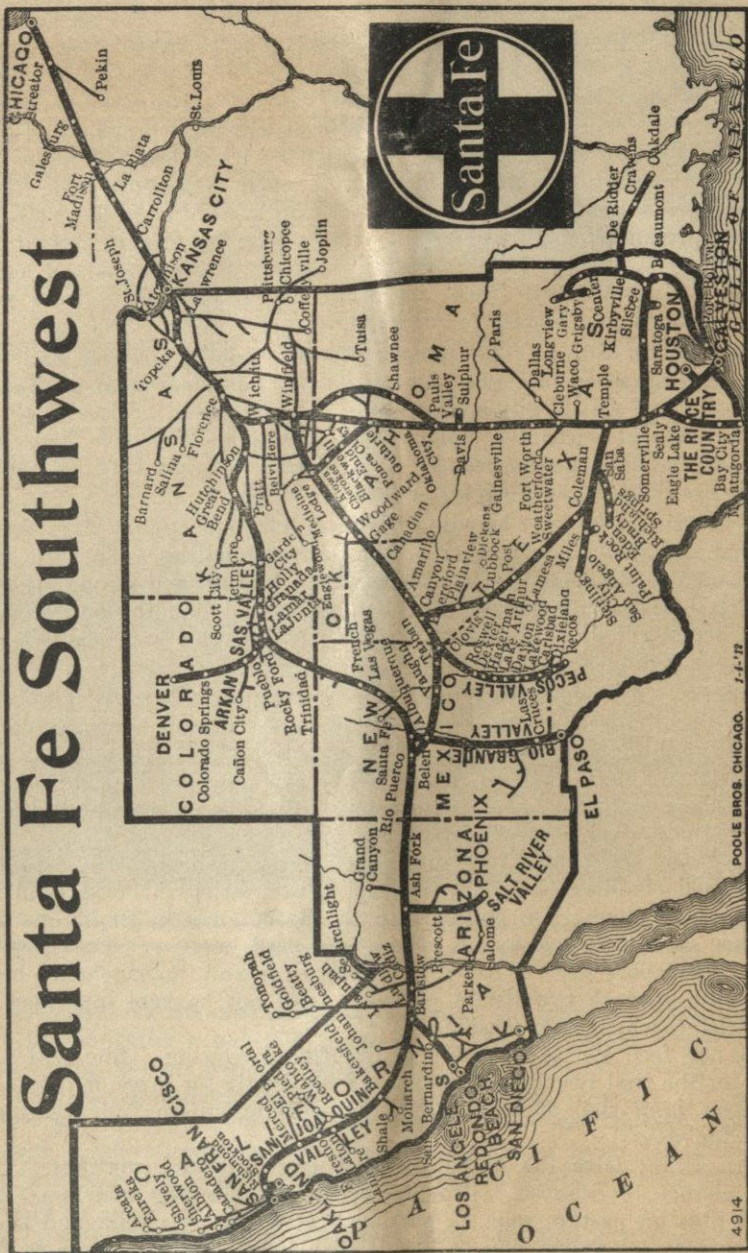
**FEEDING THE BROOD SOW:** The sow developing a litter of pigs must be fed something besides kafir corn or maize; her system craves it. A lack of something else like alfalfa hay, cracked wheat, peanut hay, soy bean hay or oil meat, will often cause her at farrowing time to eat her pigs. If she doesn't eat her pigs they will be lacking in vigor and vitality, and often the mother does not have a proper supply of milk.

The brood sow cannot be handled as a fattening hog. She should be kept in good condition but not fat. Give her variety of feeds and not kafir or maize alone. Do not pen up the brood sows in small quarters, but rather give them plenty of room, they need exercise. Put them in pasture when possible. With the proper care and management brood sows should produce two litters per year, and not be kept one year for but one litter, which is expensive.

Do not feed the sow heavily until after farrowing. She will need no feed for the first twenty-four hours. Feed lightly for three or four days. Give warm bran slop at first, gradually working up to full feed, in a week or ten days.

**THE PIGS:** Give the pigs plenty of fresh air and sunlight. Give them a chance to exercise. Provide warm, dry sleeping quarters. Put sow and pigs on pasture soon as possible. Give the pigs milk and shorts slop or water and shorts slop as a side dish when they are three to four weeks old. Wean at eight or nine weeks old. Keep them growing.

# Santa Fe Southwest



POOLE BROS. CHICAGO. 14-12

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