

BETTER FRUIT

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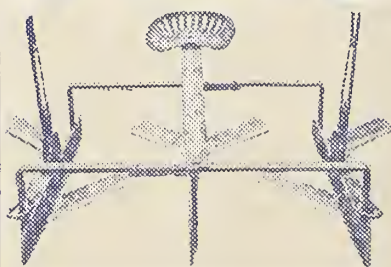
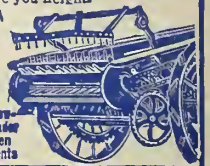
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Growing Vegetables for the Cannery and Evaporator

By A. G. B. Bouquet, Division of Horticulture, Section of Vegetable Gardening, Oregon Agricultural College

TIME was when vegetables were of minor importance in the packing of various horticultural products in canneries, and more recently in evaporators. The packing of a few vegetables was done between the handling of fruits and so helped to keep the plant running more uniformly and somewhat enlarged the output. This situation has now been considerably changed, for the quality of Oregon products being more widely and favorably known and with vegetables playing an important part in the feeding of the warring nations, there has been an increased activity in the vegetable market and the packs in all canneries have been greatly enlarged. At the present time the Oregon output is of considerable importance, and offers to the vegetable grower a market for all or part of his crop which formerly did not exist. Vegetable growers are interested in the welfare and advancement of the canning and evaporating industries, for they have made it possible for them to grow many tons of perishable produce and many growers have been in a large measure dependent upon the factories for the sale of their products. In view of the somewhat limited opportunities for marketing fresh vegetables in the markets of the state, the cannery and evaporator have stimulated production in districts where they are operating and elsewhere, and in case of a glut on the market of a certain vegetable this crop could be diverted to a factory handling it for the purpose of processing it.

With some crops such as celery there is a great amount of waste due to the strippings of the stalks in the preparation of the bunches for the crates. I saw in a celery field recently strippings which I later figured to be worth not less than two hundred dollars to the grower at the price ordinarily paid for celery, namely, thirty dollars per ton. In the case of some other crops such as onions, the smaller bulbs which may be graded out for lack of size would make just as good onions for dehydrating as the larger bulbs. Cabbage that is burst slightly will be as fully acceptable as that which is solid if the cabbage is going to the kraut factory.

Oregon has already made a reputation for itself in the vegetables which it has packed and is packing. A letter to me recently from a cannery manager here in the state reveals the fact that, according to one of the best authorities on the subject, the Northwest will be looked for in the future for the largest amount of string beans in the country. What is true of the quality of the beans is true of practically all of our canned

vegetables. Premium prices, or prices above par, have been paid for Oregon products. The growth of the industry is on an upward grade and undoubtedly will continue in its growth.

As far as the success of the cannery or evaporator is concerned it is necessary, for the greatest economy, to have the same located in an area where vegetables of all kinds may be suitably grown. A strictly fruit-growing area may not be well suited to vegetables and vice versa. Some of our best vegetable-growing districts in the state are at the present time producing little fruit, so that the factory may not always be able to be so located as to be supplied with both kinds of products from nearby territory. Growers should be able to receive more money if the majority of the produce is nearby grown, so that the factory is not put to the expense of paying costly freight bills, as some of our factories are forced to do, going even into other states in order to get their raw material. Our problems in regard to this business do not lie in the ability of the soil and climate here to produce quality vegetables, if the grower will do his part in proper production and delivery.

Where one knows the price that he will obtain for a certain crop and he is sure of the market where it is to be sold, growing a vegetable under contract will be found satisfactory and ordinarily profitable, provided, however, the grower meets the conditions that are necessary for producing vegetables of good quality, obtains no less than a normal yield, and delivers the product in suitable condition. The success of the grower in these particulars and the prosperity of the factory are, therefore, two correlated factors. The success of the one cannot be accomplished without the success of the other.

Two important factors in profitable vegetable gardening on a contract basis or for a co-operative concern are: (1) The securing of a normal yield or more than a normal yield, and (2) the reduction of the items in the cost of production to a minimum. When no more than the contract price is to be obtained it can readily be seen that, to put this business on a profitable basis, there must be obtained a certain tonnage which will offset the cost of production and give the grower a reasonable profit. I will refer to this proposition a little later on.

One of the greatest problems in the relation of the factory to the grower at the present time, or at any other time, is the amount of raw material that will be delivered to the factory by the

grower. Very often this is a shortage rather than an oversupply. The factory management is never certain of their possibilities of securing their needs of the raw products. This uncertainty was well exemplified by this last season's pack, when, due to the dry summer season and the late spring, many vegetable areas failed entirely to deliver anything near a normal yield. One acreage of beets, for example, that normally would have given an average yield from forty-five acres produced no more than would be obtained from ten acres. In a similar way, another cannery found that the pack of string beans this year did not equal the output of last year, although the contract of acreage was almost twice as large as in 1916. This shortage of delivery may be due to classes of factors—one controllable and the other uncontrollable. Unfavorable weather conditions are beyond our dictation, but we can have something to say about soil selection, soil fertilization, maintenance of moisture, planting and caring for the crop, and the conditions of the vegetables at delivery. Crop shortage is unprofitable to the grower and disappointing to the factory which relies upon him to fill a contract delivery, the plant in turn being looked to for a definite supply by the brokers or jobbers. The controllable factors affecting what kind of a delivery will be made and whether vegetable growing for the factory is profitable or not are some of the important problems which I have in mind.

Concerning the distribution of seed to growers, I do not doubt but that considerable care is used in getting the best that can be obtained. It is well to bear in mind, however, that merely the question of what variety is to be distributed is not entirely solving the seed problem from the grower's standpoint. Of great importance is the question of the seed strains, the quality of which may be good, bad or indifferent.

Recent field trials by experiment stations show that the differences in the yield and type of different strains of the same variety are caused entirely by the quality and breeding of the strain to such an extent that in growing cabbage, for instance, the marketable value of one strain would be worth twice as much as that of another, the poor strains not paying the cost of production of the crop grown from them. Just what plan is to be followed in buying seed to secure the best is not for me to say here, but it is of the utmost importance that more attention be given to seed quality and seed strains which are to be given growers to plant. The question of what beets your grower

delivers to you is not so much of one whether he is growing Detroit Dark Red or Early Model or some other variety, but more of a question of uniformity of color and shape and quality, which are not characters of any one variety any more than may be brought about by the care in selection of a good strain.

It cannot be too strongly urged upon factory managers to use every possible precaution to select seed of the highest quality for their growers. This part of the business lies in the hands of the factory. We must educate the farmer also to be willing to pay more money for seed that costs more money to grow and upon which is spent extra time and money in selection. It is well to realize that in growing a vegetable for market the cost of the seed is from one-twentieth to one-hundredth of the gross receipts. Here, then, is one of the smallest items in the cost of production and yet one of the most important. It is unreasonable for us to expect a high-grade product at an unreasonably low price. It may not always be that the price charged and the quality of the commodity are commensurate, but as a general rule there is usually a suitable degree of parallelism between the two.

Going back for a moment to the question of a profitable yield, it is noticed that this has always been one of the reasons why in many cases growers have not made money in growing vegetables on a contract basis or for cooperative concerns. With beets at \$25 to \$30 per ton, it is necessary that there be a yield of two tons before the crop is paid for and profits are begun to be realized. It will cost approximately eight dollars per ton to raise the crop. If cabbage is grown there must be a yield of five tons before a profit is started, for it will cost approximately six dollars to grow the crop. Ordinarily half of the gross receipts of a normal yield will equal the cost of production, although this will vary with the individual vegetable, but when the yield is above normal there is less cost per ton in production and the net receipts are greater. If good yields are necessary to put the vegetable business on a profitable basis, they can only be obtained by an observation of the following: (1) The proper choice of a crop for the soil or a soil for the crop. (2) Fertilization sufficient for the crop needs. (3) The best preparation of the ground for the seed. (4) Proper seeding and maintenance of the crop. (5) Giving the crop due attention and not considering it of minor importance with other crops that are being grown in such a way that the vegetable is neglected.

In any community where farmers are solicited to grow a few acres of vegetables for the factory, there are a number who, beyond the fact that they have had a home vegetable garden, have never produced vegetables on an acre basis. They do not realize the intricacies of vegetable growing as a business and possible underestimate the necessary conditions under which a vegetable will best grow. Possibly it is taken for granted that farmer A or B

knows just the best method of growing so many acres of beets, beans, carrots, or what not. After seed is furnished him he may or may not be left to his own resources of selection of land, best methods of fertilization and cultivation, etc. Is it not a wonder that our factories do as well as they do in getting a uniform product in view of the variation in conditions of growing?

The discrepancies, therefore, that are to be noted in the yield of vegetables and the profits made by a grower are largely determined by the personal experience, and the attention he gives to his vegetable growing and the conditions which he has provided for growing the crop. Fortunately vegetable growing is no more than a one-season business, at the end of which mistakes which have been made can be rectified in the next year's work. I was talking recently to a traveling man who is in the habit of observing field conditions closely, and who mentioned an instance of the difference in yield which he observed where the same crop was grown under like conditions. In this case the railroad cut a certain field in two parts. On one side of the track the yield was twice that on the other side. This was due to nothing more nor less than the way in which the land had been farmed on the two respective portions of the tract.

If the farmer is not a gardener by profession he may not fully understand the soil requirements for vegetables. He must study closely the relation of the soil to the vegetable and endeavor to harmonize the two. A Willamette Valley soil in good fertility may produce satisfactory yields of grain, but planted to string beans, beets or cabbage, or the like, the yield might be light and possibly unprofitable. Land that has been built up with manure or cover crops is the only suitable soil for vegetables outside of those lands that are naturally fertile. There must be quality, size and appearance and yield in the crop, which cannot be done with soils of ordinary fertility.

Commercial gardeners of the state, you will notice, are today operating on land that is slightly, if not very much, superior to the ordinary run of farm land—superior in texture and either in natural fertility or by actual fertilization. Many general farms have pieces of richer land than found on the rest of the farm, areas of swale and organic matter, which if well drained and utilized will make big yields of the best crop. These are the parts of the farm that can be made most profitable by growing vegetables. There are many hundreds of acres of land of organic nature in the state which will in the future be largely used for vegetables marketed fresh or delivered to canneries or evaporators. Such land is exemplified by the Lake Labiseh district near Salem, and the many acres in Northwestern Oregon from Portland to the Astoria coast. These lands, together with other Columbia River acreages, are highly productive, are easily worked, and have unusual moisture-holding capacity. The amount of vegetables that could be produced on these

lands ought to be fully sufficient to take care of the demand for such stuff by the factories. Cabbage, spinach, onions and celery can be safely counted on to produce large yields of these vegetables. Under most circumstances it would be possible to get two crops off the same area, using spinach, followed by cabbage or celery. Such double cropping is possible when the soil is fertile and the first crop is a short season one. Early peas or beets make a good first crop, to be followed later by late cabbage or late string beans, or possibly fall cauliflower.

Fruit growers and farmers who have as their specially crops other than vegetables but who are putting in a small acreage for the factory will have to consider the factors which I have mentioned in regard to a crop for the soil and what they can best grow with the cheapest labor. Crops that can usually be grown between trees or that can be handled somewhat cheaply on land unplanted to orchard are potatoes, cabbage, squash and possibly roots and onions.

In a recent visit to the cabbage-growing districts of a certain county I noticed many soils which were planted to this crop which, in my estimation, should never have seen a cabbage plant set on them. Many of these soils were lacking in moisture-holding capacity and general fertility. If possible to select such a soil, the land for vegetables should be easy working, inexpensive to prepare, given to holding considerable moisture and reasonably fertile. If the soil of a farmer who is figuring on growing vegetables for a factory does not begin to compare favorably with these characters, it had better be planted to something else.

Last summer furnished a good illustration of the fact that, no matter how rich the soil may be, its moisture was the determining factor in the yield of the same. With our dry summer the possibility of supplying the crop with sufficient moisture is the dominating factor. In looking over the various cabbage fields which I mentioned there were but few in which there were normal yields of the same, the exceptions being in those cases in which the soil was of such a character so as to hold an unusual amount of moisture. In some cases, it was the inability of the farmer, due to the season, to put the land in proper condition that was responsible for the losses. If moisture is the potent factor then thorough spring preparation of the land is necessary. Clods must be crushed if the fullest value of the moisture is to be held. The soil that will not crush and pulverize will not ordinarily make vegetable growing profitable.

The style of soil preparation for a grain bed will not suit a vegetable seed. Fall or winter plowing is to be encouraged and the soil in the spring should be stirred constantly from the time that it is workable until planting time. It is necessary to use skillful cultivation if big yields are to be obtained. Soil fertility is one thing from the vegetable grower's standpoint and another thing from that of the general farmer. Good beans cannot be grown with the

best quality and yield on prairie land. It takes a fifty-bushel crop of wheat per acre to equal the amount of nitrogen and phosphoric acid removed by an average crop of cabbage, turnips or onions, and the vegetables remove five times as much potash as the wheat in addition to a much larger amount of water. This means, therefore, that the yield is proportionate to the amount of available plant food that the soil has and its ability to conserve moisture. In the delta regions cabbage yields have been running this year as high as twenty-five and thirty tons per acre, the cabbage selling for fifteen dollars f.o.b. shipping point. This high yield is due to combination of the soil qualities that I have just mentioned.

Manure is getting scarcer than it formerly was, which makes it almost necessary that more vegetable land be cover-cropped and built up by green manures. In this way we can use much less manure than we have been using in the past. In a discussion of the subject "Can Vegetables Be Grown Commercially Without Animal Manures" at the recent meeting of the Vegetable Growers' Association of America, which I attended at Springfield, Massachusetts, it was the conclusion of the speakers, after visiting many acres where vegetables are grown for canneries, etc., that when the manure supply is short, light applications are wonderfully effective in rotting the organic matter of the green manures and increasing the availability of the plant food which they contain. A limited amount of manure, a cover crop, and fertilizers have brought results in numbers of cases. An answer to the above question was, "Yes, for truckers and cannery growers. All over the country we find men who are doing it."

There seems to be somewhat of an aversion by some regarding the use of commercial fertilizers, but I do not agree with such an attitude, provided the soil conditions are studied and care is taken in obtaining a standard fertilizer. I am not here to say that the artificial fertilizer will make for increased yields in every case, but I know that in many regions where the land is being fertilized with cover crops the yields are being brought up through proper applications of some fertilizer that particularly fits the needs of the crop. It will be necessary, in every case, to check up on the value of the fertilizer to the crop. Very often the use of a small fertilizer will make all the difference between half a crop and a full crop or nearly so, with a resulting net profit which will be satisfactory after deducting the cost of the fertilizer. Time will forbid me from going into this part of the crop growing to any length.

The requirements of some vegetables as regards the amount of labor necessary to handle them is of considerable importance in determining what crop will be grown. The cost for labor in handling a crop will vary with the individual crop. One man, for example, can take care of twice as much acreage of cabbage as of onions, and possibly one-third less celery than onions. The

labor item considers not only the cost in growing the crop but also whether the labor is possible to be obtained. This is true in the case of growing string beans for the factory, in which case the profits of the crop are reduced to a comparative small amount if an expensive wage must be paid to pickers.

There must be careful inspection on the part of the farmer as to the character of the vegetables which are delivered. Toughening of fiber through long standing in the field or elsewhere causes the vegetable to lack the desirable quality. There is, in some cases, a tendency among some growers to allow their products to become too mature before delivery. Fancy stock for processing, therefore, is impossible to be obtained. If the majority of farmers do not pay strict attention to this factor in delivering there must of a necessity be a lowering of the entire grade and a cheapening of the product. This is not just to the grower who is careful about his stock at delivery time. The production cost is practically the same for either first or second grade, while the gross receipts may be twenty-five or fifty per cent less. In this re-

gard, therefore, there must be the strictest co-operation. The grower must be given a fair price for his vegetables that will enable him, with a normal yield, to pay the cost of production and receive a fair interest on his investment. Likewise the grower should endeavor to deliver good quality produce rather than try to get rid of poor, unmarketable vegetables. In matters of this kind, some growers have not always been fair, for they have had a tendency to try to unload some stuff on the cannery which would not be desirable to process.

I have in this article only touched upon some of the many phases of crop production. We can confidently expect that if care is taken in obtaining all available data before the choice of vegetables is made and if the grower will give them the proper care, there should be not a great deal of difficulty in getting satisfactory returns in the growing of one vegetable or another. I have endeavored to emphasize particularly the fundamentals underlying the success of vegetable production, hoping that these points mentioned may furnish subjects for discussion.

The Codling Moth Trap

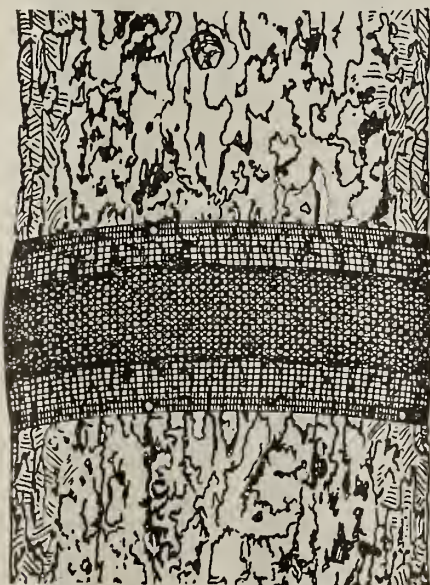
By Alfred M. Wilson, Clifton, Colorado

THE following are some of the reasons that should commend to apple growers the codling-moth trap thought out and perfected by E. H. Siegler, the codling-moth expert of the United States Department of Entomology: (1) The traps will do the work they are designed to do. The worms can get into the traps, but the moths cannot get out. They are trapped for good and die in the traps for lack of sustenance. (2) The traps reinforce the bands. They do not do away with the bands, but they do make the bands more effective by removing the element of uncertainty in the running of the bands. If they are not properly cared for, the bands, as too many growers know to their cost, may become sources of infestation; but that source of danger is

entirely removed when the bands are reinforced and strengthened by the use of the traps. (3) The traps do away with the necessity of running the bands. In other words, the traps, if they are properly attached to the trees, do their work automatically and without further assistance from the grower. (4) The traps are, therefore, great time savers. This at the present time when labor is so scarce and so costly is an important consideration. (5) The traps can be made by the growers themselves. The only unavoidable expense is that for material. (6) The traps can be attached to the trees at any time in the year most convenient to the grower. For example, the traps can be attached to the trees in the fall and winter when the work is somewhat slack. (7) The traps need not be renewed oftener than every two years. (8) The cost for the material and the expense involved in making the traps and in attaching them to the trees should not exceed the cost for labor to run the bands during one season.

The traps are simple contrivances made out of twelve-inch wire mesh screen cloth. The mesh is first cut into strips six inches wide. The strips are then "crimped" and cut into the desired lengths. The crimping may be done either by hand or by means of a crimper such as is used by tanners in crimping stove pipe. But the main thing is to attach the traps properly. So important is this matter that the experts emphatically state that unless the bands are attached as they should be, the growers have no right to expect the traps to do the work they are designed to do.

In the first place colored bands, folded once, are put on the trees. Then over the bands the traps, which, by the



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way, should preferably be made out of the wire mesh known to the trade as Japan wire. In attaching the traps to the trees the following points should be carefully observed: (1) The upper and lower edges of the trap must be tacked to the tree in such a way that they both fit snugly against the bark. (2) There should be a free space of at least one and one-half inches between the upper edge of the band and the upper edge of the trap and an equally free space between the lower edge of the band and the lower edge of the trap. (3) The trap must have a bulge which shall raise the trap at least an half inch above the band. It is vital that the trap must not at any point come in contact with the band; otherwise the moth, if it should at the point where the band is in contact with the trap, emerge from the chrysalis state, might be able to escape from the trap. And if it did, that, to use an homely phrase, would be to "spill the beans." Hence the necessity for a lasting bulge to the trap. The desired bulge can be secured by driving the proper distance into the tree through the band a certain number of nails such as are used in nailing

down slate roofing. (4) The strip of wire mesh out of which the trap is made should be long enough to allow for an overlap of at least two inches. An overlap of three or four inches would be better.

For two years Mr. Siegler carried on, in the fruit section of the Grand Valley, Colorado, investigations into the habits and life history of the codling moth. During the second year he had the assistance of H. K. Plank, also of the Department of Entomology. The third year (1917) Mr. Plank was in sole charge of the work. But it was Mr. Siegler to whom credit for the discovery of the trap is due. In October, 1916, Mr. Siegler published the results of his investigations in the Journal of Economic Entomology. In December of the same year he read a paper on the same subject before the American Association of Economic Entomologists.

During the past year two of the most prominent growers in the Grand Valley, J. Lee Morse and C. E. Wixon, tested out the traps in their orchards near Grand Junction. During the same year Mr. Plank, Mr. Siegler's assistant, was experimenting with the traps in

the orchard of Charles Lamb, a successful orchardist in Highland Park, midway between Clifton and Grand Junction. These three orchardists are convinced that the traps are invaluable.

South America's Taste in Dried Fruits

Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.

THE failure to sell important quantities of American dried fruits in South America is due in part to the native's preference for dried fruits that may be readily eaten out of hand without further preparation, according to a bulletin entitled "South American Markets for Dried Fruits," issued today by the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

The predominance of European dried fruits (prunes, raisins and figs) is especially marked in Brazil, and only slightly less so in Argentina and Uruguay, says the report. Home-produced fruits practically displaced all others in Chile, with the United States ranking second only to the United Kingdom in the small trade in imported fruits. Peru is the only country considered in this report in which California fruits outrank those from all other sources. Chilean fruits practically monopolize the markets of Bolivia. During the last year or so there has been a decided tendency in South America to buy in the United States certain lines of fruits that formerly were purchased almost exclusively from Europe, and it is thought that proper attention to the requirements of the market will make permanent at least a part of this trade.

The report points out the shortcomings in American methods of competing with European countries in the South American markets and offers constructive suggestions for making more of our opportunities in the future. Copies can be obtained at the nominal price of five cents from the Superintendent of Documents, Government Printing Office, Washington, D. C., or from the district or co-operative offices of the Bureau of Foreign and Domestic Commerce.

"Principle and Practices of Pruning," by M. G. Kains, is the title of a very interesting and instructive book which is well worthy of every fruit grower's reading. The price of the book is two dollars. Published by Orange Judd Company, New York.

Howard Ewatts Reed of Beaverton, Oregon, has published a small book, "Profit From Spraying," which contains much information about spraying of the different kind of insects and pests that infect orchards and vegetable gardens. The price is 25 cents.

Liberty Bonds. — The next Liberty Bonds will probably be offered in April. A word of advice seems timely. It is the duty of every citizen of the United States to begin saving and prepare to participate in the Liberty Bond sale in February.

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Fruit and Its Effect on the War

By W. F. Gwin, of Fruit Growers' Agency

THE exclamation of the food editor of an important newspaper after reading an article recently issued by the Fruit Growers' Agency which discussed the food value of the apple was: "Who would have thought that of the lowly apple!" One might wonder why a food editor should have confessed to ignorance in so important a food as the apple, but there are further wonders "coming up" on the apple, for here now comes a great and serious authority warning the military authorities of Great Britain that her soldiers must have apples for proper "nerve nutrition" and health. The authority in question is Dr. Josiah Oldfield, Senior Medical Officer to the Lady Margaret's Fruitarian Hospital of England, and his essay is "Fruit and Its Effect on the War," and is as follows:

"In the early weeks of the war I gave an interview to one of the London dailies, and ventured to prophesy that the end of the contest would be influenced largely by dietary problems, and in these problems I did not consider that the question of protein and scale calorific values for muscular substance would be of so much importance as those of foods which supply nerve nutrition, i. e. fats and salines. It is very difficult to deprive any besieged country—or even any besieged city—of all sources of muscular nourishment so long as any other cellulose remains to

be transformed by chemical agencies into a more digestible form of carbohydrate. The difficulty for Germany as a beleaguered country was therefore not really either meat, or cereals, or potatoes, but fats and fruits and salads.

The joining up of Turkey threw my prophesy out of gear as to time, because it opened up the great stores of oil and figs and other fruits of Asia Minor. This source is slowly failing, and today, in spite of a complete calorific dietary, the people of Germany are beginning to develop the disease of mal nerve nutrition. There are beginning in Germany

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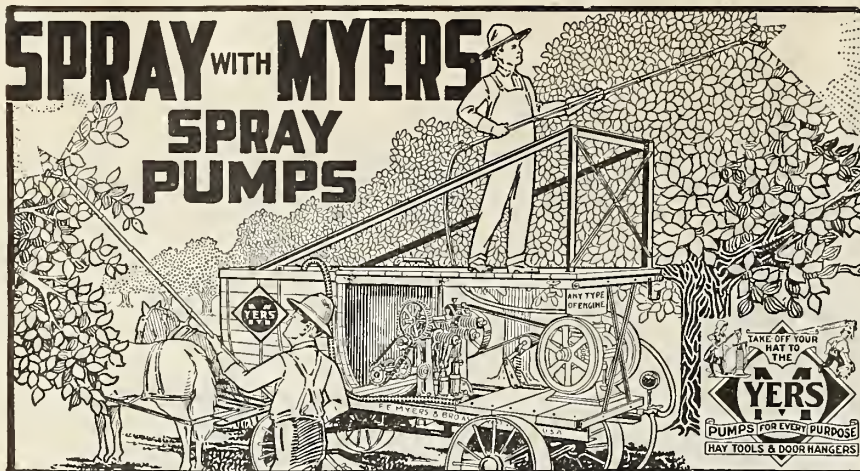
GREENFIELD, OHIO

Canadian Branch: Chatham, Ontario.



(1)

Pat. In U. S. Dec. 1, 1914.
Pat. In Can. Apr. 6, 1915.



Those neglected fruit trees—you will find them everywhere—perhaps you have them in your own yard or out in the orchard, that for some reason or other you have failed to take care of in years gone by and now class them as non-producers, worthless except for shade.

You are surely going to give them attention this spring as well as every other tree, vine, shrub, bush or plant about the place, on which you depend for your fruits, berries and vegetables. Start early with this work before gardening and planting time. Trim up your trees and plants and put new life into them, so they will amount to something and do their bit when the time comes.

Whether you raise fruits or vegetables, you will need a spray pump of some kind so we recommend the MYERS LINE of Bucket, Barrel and Power Spray Pumps to your attention—the Easy Operating Cog Gear Bucket and Barrel Pumps for hand use, and the Myers Automatic Power Pumps and Complete Outfits that do not require a relief valve for extensive power operations.

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Ask your dealer or write us immediately about them—Time is limited until you must get busy, and when you start we want you to have a real fighting machine in a Myers Spray Pump.

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concentrated form of proteid; rice and wheat and maize, the most important of the cereals; olive oil, sesame oil, peanut oil and almond oil, the finest forms of fat; apples, lemons, oranges (and onions) are immeasurably the most important of fruits, which are nerve foods, and without the presence of whose salts physiological functions fail. It will be a grave risk to England's home stamina if her supply of apples is cut off, because during winter conditions in this climate they are superior to either lemons or oranges, and cannot be replaced by any other fruit."

That there is a vast message to humanity in the above article is apparent on its face. Slowly but surely we are beginning to understand "physiological chemistry," of which science "nutritive salts thereapy" is a most interesting and most vital branch. The old simile of the human body being like a machine may again hold good roughly here when it is said that no machine can function without all its parts and all its offices being served—and just so the human body cannot live unless those cells which compose it are all fed with the "chemicals" they need for their life. Without the mineral salts which are in apples or other fruit there will be nerve cells and other cells which will not function. Pellagra, due to continuous corn and syrup diet, scurvy, a foul disease in its worst form, and other such diseases are caused by false diet, and there would be no such ailments had the victims apples to eat. In a word, when Dr. Oldfield warns the British military to look out for its apples, he not only talks deep science, but just common horse sense.

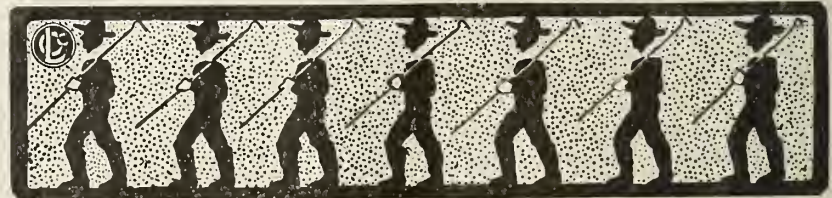
Loyalty in Little Things

The whole great problem of winning the war rests primarily on one thing, the loyalty and sacrifice of the American people in the matter of food. If we are selfish or even careless, we are disloyal; we are the enemy at home. Now is the hour of our testing.—U. S. Food Administration.

already grave manifestations of the basic origin of many diseases. The latest is a widespread oedema in the legs and feet and face, of which particulars are given in a late issue of *The Lancet*. This will steadily get worse and worse as another winter comes on unless fresh fruit, and salads and seed oils, can be introduced largely into Germany. I have dealt at length with Germany and her fate, to emphasize the great importance of avoiding a similar catastrophe for England. English stamina, courage, endurance and heart for the war depend on complete nerve nutrition. Now for this the calorific values of wheat, or beans, or beef, affords no criterion. The danger is that laboratory scientists will measure the comparative importance of cargoes by calorific values, and will on this ground tend to debar juicy fruits as being very light cargo compared with legumes or cereals. Every effort should be exercised to prevent this, or else, when the mischief is done, there will be a panic importation of anti-scorbutic fruits. I note that a small number of ships are still allowed to run to the West Indies for bananas, and this is excellent, but weight for weight and bulk for bulk, the most important

fruit to be imported during the winter and early spring of 1918 is apples. Were I food controller in Germany and allowed the choice of free import of one article of food from November to April, I should select the apple. So, in England, while for importation purposes legumes and peanuts are the most

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A Meat Stretcher

Many recipes for combinations of rice and meat have come to us from those parts of Europe where meat is used mostly for the flavor it gives other foods. In our efforts to cut meat consumption rice becomes interesting as the most useful meat stretcher. It can be used freshly cooked or as a left-over. In its many varieties Pilaf is most popular among the Oriental people and is frequently served at dinner as the principal dish.

Rice Stew.—Wash a knuckle of beef and place in three quarts of cold water for an hour. Put it on the stove and let it gradually heat, then simmer for two hours. Any scum rising when it first begins to boil should be skimmed off. Prepare one-half cup each of chopped onions, carrots, cabbage, tomatoes, one-fourth cup of turnip, three cloves, a pinch of cayenne, black pepper and one and one-half teaspoons of salt. Add these to the simmering meat and let boil for one hour; then add a cup of rice and a bay leaf. Boil, stirring occasionally until the rice is cooked. When the kettle is closely covered there is little need of adding water. Add boiling water if needed.

Scalloped Rice.—To prepare this economical dish use two cups of boiled rice, one cup of white sauce and one-

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FRED EBERLE, General Manager

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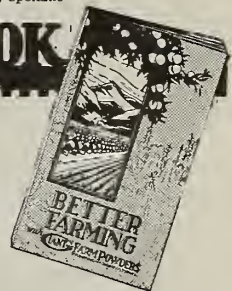
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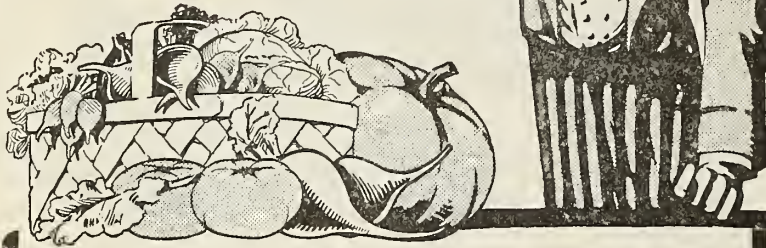


fourth cup of finely shredded codfish which has been parboiled ten minutes in hot water. Cover the bottom of an oiled baking dish with rice, then add the codfish and cover with white sauce. Sprinkle the top with bread crumbs and bake in a moderate oven until brown. Eggs may be used to top this scallop instead of bread crumbs. Arrange fish and rice in alternate layers, finishing with rice. Add white sauce to each layer and sprinkle with paprika. Carefully break four eggs on top, dot with sauce and season with salt and paprika. Bake in oven until eggs are “set.”

White Sauce.—Melt two tablespoons of fat, and add two tablespoons of flour, and salt and pepper to taste. Cook thoroughly until blended. Pour in gradually one cup of milk, stirring constantly. Cook until smooth and glossy.

Cheesed Rice.—Put in a double boiler or chafing dish two cups of boiled rice, one-half cup of hot milk, and heat thoroughly over water. Then sprinkle lightly over it half a cup of grated cheese and a few shreds of pimiento. Cover tightly and let stand over the hot water until the cheese is melted. This is acceptable for Sunday tea.

We Must Fill That Basket



This is the most vital of all win-the-war messages. It is addressed to you and to us—so that you will put forth every available effort and resource to plant big crops, and to us that we may strain every effort to supply the highest quality seeds for fruitful production.

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Growing Orchard Crops

By Prof. C. I. Lewis, Oregon Agricultural College

ORCHARDISTS are asking themselves at this time what they can grow in their orchards to help the food situation. In young orchards from one to five years of age, under normal conditions, the best crops to grow are such crops as strawberries and hoed crops such as tomatoes, mellons, squash, peas and beans. To a certain extent, even under war conditions, such crops should still be produced, but the acreage is somewhat limited—at least the market for the acreage of some of these hoed crops is somewhat limited—and orchardists should see to what extent they can grow crops requiring the minimum of labor and yet give large returns of the world's food. Navy beans should be considered. Seed potatoes, corn for ensilage or for hog feed, strips of vetch such as purple vetch to be raised for seed purposes, or vetch and oats for hay, such grains as wheat, barley, oats and buckwheat may also be planted. In these young orchards, however, good wide strips should be left close to the trees so that the grain will not take away any food and moisture which the

trees need. If you are not careful, you will be robbing the trees in order to grow a temporary crop and will injure the orchard more than the money you will obtain for the crop.

Where hogs are to be kept on the farm, a rotation of crops could be grown to good advantage. In the early spring, Canada field peas should be planted, and this will give some very good feed to help in turning off the hogs. For summer planting, about the middle of July drill in such crops as Aberdeen and Cow Horn turnips, vetch and rape. This will make most excellent hog feed in the fall and winter. In orchards six to eight years of age which are not bearing heavily, but which are very vigorous, grain is the ideal crop. Such grains as barley and oats can be sown for hog feed and the hogs can harvest such grains to very good advantage. Another crop which should receive more consideration from the orchardist is buckwheat. This crop allows for late seeding. It should be put in an orchard where climatic conditions have ruined the crop for the coming

year. It will grow with a relatively small amount of moisture and can be handled fairly easily among the trees and is a good cash crop and a good substitute for wheat in our food ration. A much larger amount of buckwheat should be raised among the orchardists than has ever been raised before. The buckwheat, in addition, has a tendency on the heavier soils to make them lighter and less compact and improve their physical condition. Orchardists should not neglect the possibilities of sheep feeding. Right now in many orchards in Western and Southern Oregon there is most excellent sheep feed. Sheep could be turned into those orchards and could be allowed to run until about the time of the spring plowing. Of course if the ground is poorly drained and too heavy, this practice might be questioned, but in the majority of orchards this is not true, and mild winter has given us a wonderful amount of feed which could be turned into mutton and wool. Orchards which have very good cover crops will support sheep at this time to very good advantage and the manure from the sheep will compensate to a large extent for the loss of organic matter. If sheep injure trees they must be removed, but this seems to be the exception where there is plenty of feed.

Where orchards are mature and in bearing and are unirrigated, there is practically nothing that can be grown to advantage unless one could pasture off some of the cover crops this spring. In irrigated districts where alfalfa and clover can be grown abundantly, sheep can be used to good advantage. In all these practices, however, one should watch the trees carefully to see that there is no injury by the animals or by having all the moisture and food taken away from them.

Rice with Vegetables

Rice can be combined successfully with vegetables, and some of the dishes are substantial enough for meatless days. Red beans with rice make a favorite dish in many parts of the world.

Red Beans and Rice.—Soak over night a pound of red beans. Then simmer for at least four hours in two full quarts of water. When the beans are quite soft, add a teaspoon of salt, a teaspoon of fat, a small onion (minced) and half a red pepper. Continue the simmering process for two hours longer. Serve with boiled rice. The combination is not only good but represents a complete ration.

Cabbage with Rice.—Boil a head of cabbage until tender, drain and cut out the heart and center, fill in the opening with a cup of boiled rice, which has been highly seasoned with salt, pepper and fat. Pour over all a cream sauce. Chopped pimientos may be added to the rice or paprika dusted over the whole after the sauce is added. This makes an excellent dish when the meat course is light.

Rice and Onions.—Chop six onions and put them into a frying pan with one tablespoon of fat. When tender

add an equal quantity of boiled rice, and season with salt, paprika, one teaspoon of kitchen bouquet and one teaspoon of lemon juice. Stir lightly together, heat thoroughly and serve very hot.

Rice Farcie.—This combination of vegetables makes a flavory accompaniment for warmed-up left-overs of meat: 1 pint chopped tomatoes, 1 cup rice, 1 cup chopped celery, 1 cup chopped olives, ½ cup chopped peppers, 1 tablespoon minced onion, 1 teaspoon salt, ¼ teaspoon paprika. Rub the tomato through a sieve and heat, then add the rice, chopped celery, seasoning and other ingredients and boil for five minutes. Then put it on the side of the range and simmer for one hour until the ingredients are thoroughly blended.

Spanish Rice.—This is a deservedly popular dish and, like rice farcie, is excellent to serve with beans for meatless dinners: 4 teaspoons fat, 2 green peppers, 1 onion sliced, 1 cup rice, ½ tablespoon paprika, bit of bay leaf, 4 large ripe tomatoes or ½ can tomatoes, 2 tablespoons sugar, 2 teaspoons salt, ¼ teaspoon white pepper, ground thyme. Heat the fat in a heavy frying pan, and in it brown delicately the peppers and the onions. Remove and brown the rice. Add all other ingredients. Cover and let simmer on the back of the stove until rice is soft; add boiling water as the rice swells.

These numerous ways of using rice recipes do not cover the usefulness of rice. Soups and desserts have not been touched. A whole volume could be filled with recipes on rice cookery. Less meat and less wheat, more rice might be adopted as the conservation program of America while the world shortage of food lasts. Get acquainted with rice, the food of millions.

The Pacific Northwest Tourist Association is an association embodying the States of Oregon and Washington and British Columbia. The association is formed for the purpose of acquainting Eastern people of the wonderful scenery of the Northwest, and its magnificent climate—the object being mainly to give the tourists some idea by illustrated booklets in order that more people may be induced to spend their vacations with us, feeling that in doing so frequently many will be sufficiently impressed as to come to the Northwest to live. The association has issued several very handsome booklets or folders, as follows: Mountaineering in the Pacific Northwest, Golfing in the Pacific Northwest, Fishing in the Pacific Northwest, Yachting in the Pacific Northwest, and The Pacific Northwest. These booklets can be obtained from the Pacific Northwest Tourist Association, 1017 L. C. Smith Building, Seattle, Washington. BETTER FRUIT takes this opportunity of suggesting to the subscribers and readers of BETTER FRUIT that they send for one or all of these booklets, mail them to Eastern friends and relatives who they think would be interested, particularly those who might be induced to make a tour of the Northwest during the coming year.



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Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Growing Vegetables.—Last year on account of the Government propaganda for increased production of vegetables as well as many other products, fruit growers very extensively increased their garden patch, many of them planting sufficient to have a surplus for sale. Those who did were successful in selling the surplus at splendid prices. The propaganda was a big factor in stimulating fruit growers to conserve vegetables for winter use by canning or evaporating. The amount saved by canning your own vegetables is not generally realized by fruit growers. The editor has in mind one particular instance where the grocery bill of a family was around \$50 per month. In this instance the mother of the family canned sufficient vegetables and fruits to last the entire winter, the result being it made a difference in the grocery bill of \$20 per month. The editor takes pleasure in advising every fruit grower to plant a good-sized vegetable garden this year, and to urge the canning or evaporating of enough vegetables to last during the winter. Steam pressure canning outfits for this purpose, which will make the work much easier and enable the canner to do it in much less time, can be purchased at a very reasonable price, running from fifteen dollars up. The increased number of canneries in the Northwest will mean an increased demand and an increased market for the surplus supply which the grower has to sell. With the object of stimulating an increased production of fruits and vegetables with fruit growers for canning purposes and a surplus for marketing during the season and for the many canneries in existence, BETTER FRUIT is publishing one of the most excellent articles for growing vegetables by Professor A. G. Boquet, of the Experiment Station, Corvallis, that has ever appeared.

The 1917 Apple Crop and Prices.—To February 23 there had been shipped 20,143 cars of apples from the Northwest. It is estimated there are 3,000 more to go. This crop is about double the 1916 crop, the heaviest previous crop. So far as can be determined at the present time it appears that the crop will average the growers about 25 cents more per box. Our selling organizations are certainly entitled to the credit and the fullest appreciation of the fruit growers, at least those who rendered good returns, for the reason that the crop was the largest we have had, which made it more difficult. War conditions and saving have been factors in effecting the market, and the embargo preventing export, so it was necessary for the marketing concerns of the Northwest to market a great many more apples in the United States this year than ever before. Undoubtedly results are due to improved salesmanship, better energy, and certainly wider distribution. The subject of distribution has been covered in a series of articles in BETTER FRUIT, appearing in 1916 and 1917. The distribution for twenty days in 1917 was 550 cities, while the distribution in 1916 was 611 cities in sixty days.

Thrift Stamps.—While it must be admitted there are some people who cannot afford to buy Liberty Bonds and pay cash for them, it is unthinkable to imagine there is a grown person in the United States who cannot buy a Thrift Card. A Thrift Card holds sixteen thrift stamps costing 25 cents each. The Thrift Card when full represents a value of four dollars. When the Thrift Card is filled take it to the postoffice, or almost any bank, and exchange it for a War Savings Stamp, paying the few cents difference between the four dollars represented by your filled Thrift Card and the selling price of the War Savings Stamp. Up to March 1 the difference is thirteen cents. After that date the price advances one cent each month. This Thrift Card will have a cash value on January 1, 1923, of five dollars. If the time should arise when you need money and simply must have it, you can get it back with interest by simply taking the War Savings Stamps to the nearest money order postoffice and present them for redemption. The interest will be paid you on the sum already deposited even if it is but one War Savings Stamp.

Income Reports.—Official announcement is made that the time for filing income reports from individuals and corporations is extended to April 1, 1918. The income tax law, as passed by Congress, is a just and equitable law. It is the duty of every single citizen having an income of \$1,000 to file a report, and every married man with an income of \$2,000. It is a duty required by law that everyone must comply with, and one that everyone should cheerfully comply with. Additional taxes, on account of the war, are levied, which every true American should feel mighty glad to pay, because every true

American must and should feel that it is the prime duty of the United States to win this war and win it as quickly as possible. If the Allies are successful this war will make democracy safe for the world. Every American citizen should bear in mind we are fighting for self-respect and self-protection, the freedom of the seas and many other things too numerous to mention in a brief editorial. The longer the war continues the heavier the loss of life and the greater the expense will be, so it is purely a matter of business to go at it in the most forceful way and end the war in the quickest possible time. In order to do this it is necessary that every American should contribute liberally to every request of the Government, but a good deal more is necessary—production should be increased in every way possible and saving should be practiced to the fullest extent.

Some Orchard Crops.—To win this war it is absolutely necessary that the United States must produce the largest and fullest crop possible. Among our Allies so many are already engaged in fighting or manufacturing ammunition that labor on the farm and orchard is very much reduced, consequently it is the duty of the United States to supply them. It is estimated the United States will have to feed 30,000,000 to 50,000,000 people this year in addition to our own population. This means increased production. The fruit grower can do his share, because there are many crops which the fruit grower can grow between the trees. Valuable information is given in a most excellent article on the subject by Professor C. I. Lewis of the Experiment Station, Corvallis, whom everyone recognizes as the most able and practical horticulturist in the United States.

Fruit and Effect on War.—A very interesting article, "Fruit and Effect on the War," appears in this edition, which is of immense importance in connection with the fruit industry as well as the war. It is the opinion of Dr. Oldfield, one of the ablest physicians in England, that some of the nations at war at the present time are suffering from a certain disease due to lack of fruit. There is no question but what a great many people do not eat enough fruit, and in all probability more or less people suffer from a lack of sufficient fruit, which is shown by Dr. Oldfield to be a vital necessity to keep one in perfectly good health.

Advertising.—Advertising the apple, without any doubt in the editor's mind, was the big factor in helping to dispose of the largest crop the Northwest ever produced, at better prices than received for some years. Therefore the editor urges every organization to begin now to plan for an advertising campaign. In order to do so it will be necessary to tax growers the small sum of two to five cents per box, which they can well afford, as they get much more back than they contribute, through increased prices.

THE MYERS AUTOMATIC POWER SPRAY OUTFIT

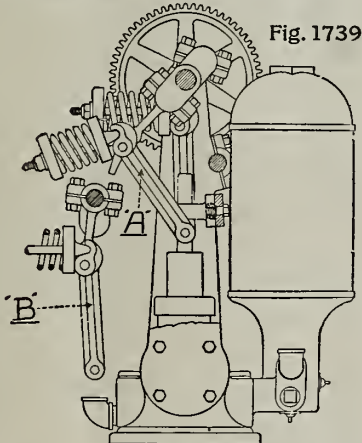
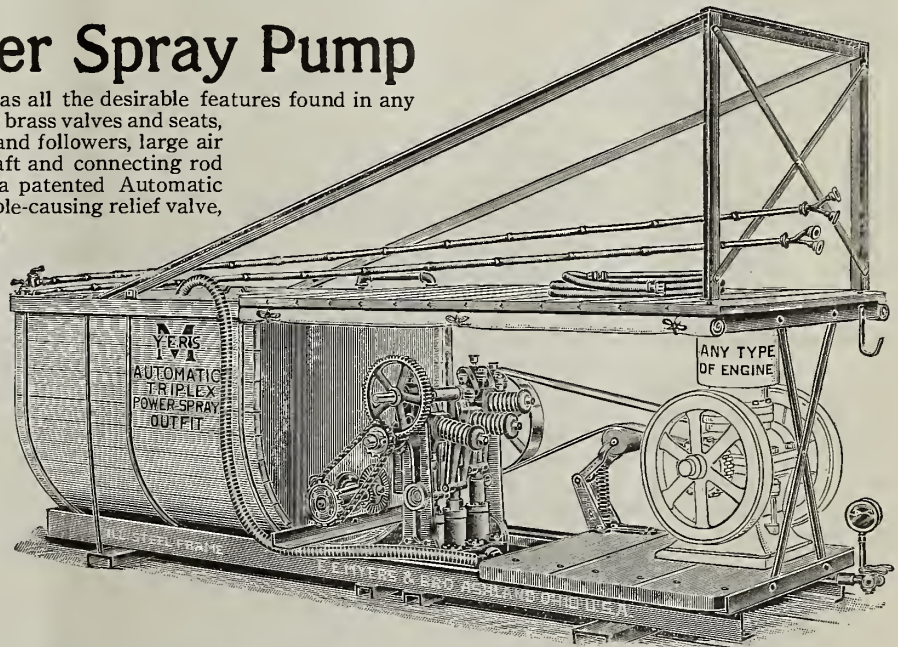
With Automatic Pressure Governor

VERTICAL CYLINDERS—NO RELIEF VALVES—MACHINE CUT GEARS

Automatic Control. Insures Safety. Secures Uniform Pressure and Eliminates Unnecessary Wear.
 Plunger Guide above Plunger Eliminates all Side Thrust and Reduces Wear.
 Belt Driven. Brass Fitted Throughout. Forged Steel Crankshaft.
 All Boxes Babbitted. Improved Oiling System.

The Myers Power Spray Pump

With patent Automatic Pressure Governor, has all the desirable features found in any Spray Pump, viz., vertical cylinders, renewable brass valves and seats, large stuffing boxes fitted with brass glands and followers, large air chamber, machine cut gears, ample crankshaft and connecting rod bearings, etc. In addition it is fitted with a patented Automatic Pressure Governor which eliminates the trouble-causing relief valve, and briefly, has the following advantages over the ordinary construction. Safety—Pressure relief is not dependent on the operation of a sluggish or defective relief valve. Uniform pressure regulation—The governing mechanism is not exposed to the clogging or corrosive action of the spray liquid which always effects the operations of the relief valve. Elimination of unnecessary wear—Plungers and valves are in action only when spray material is passing through the nozzles.

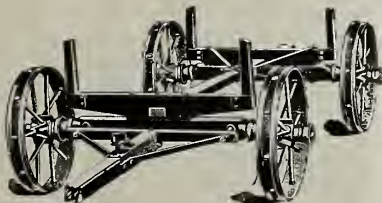
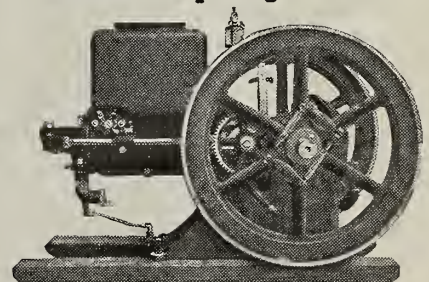


In operation the Automatic Pressure Governor has for its object the positive control of the pump pressure. This is accomplished by a simple arrangement of a combined lever and spring on each plunger connecting rod. [See A and B, Fig. 1739] which, when the pressure reaches a predetermined limit, automatically stops the operation of the plungers without interrupting the driving power, and again permits them to resume operation when the pressure falls below this limit; also removes the entire load on engine causing it to run idle [saves gasoline]. All wearing parts thoroughly lubricated.

YOU CAN USE YOUR OWN ENGINE AND TRUCKS IF YOU HAVE THEM

The Myers Automatic Power Spray Outfit

A Stover
 Good Engine
 AND THE
 Havana Steel
 Wheel Farm Truck
 MAKE UP




A Most Efficient, Reliable and Economical Sprayer

Mitchell, Lewis & Staver Co.

PORTLAND, OREGON

SPOKANE, WASHINGTON



A Year of Hard Labor LOST

By an Hour of Frost!

More than one orchardist and truck gardener has learned this by hard experience! To make certain of a full crop, install the

"Bolton" Orchard Heater

Gives maximum heat, evenly distributed. Burns cheap fuel oil. Can be lighted quickly. Burns long time on one filling. No waste—you light only enough heaters to hold temperature above the frost point.

Send for Booklet "B"

Tells you how to save your crops from frost. Filled with valuable information for the grower.

AMES-IRVIN CO.
Irrigation Pipe, Orchard Heaters, Etc.
8th & Irwin, San Francisco, Cal.

Cherry's "Dependable" Seeds

DIRECT FROM GROWER TO PLANTER—PRICE LIST FOR 1918 NOW READY

Never before has there been such a shortage of seeds as this year.

Never before has there been such a necessity for everyone to plant a garden.

You will save money by ordering "Cherry's Dependable Seeds" from our special list

Realizing that everyone must plant a garden this year, and in view of the fact that present seed shortage necessarily makes higher prices, we are not getting out an elaborate illustrated catalog this year. Instead, we will send you an advance Price List in which the **Price is at Least 25 per cent Lower** than would have been possible had we published a big book. We are grateful for your past orders, and hope you will appreciate our effort to give you low prices. Write for special Wholesale Price List.

CHAS. J. CHERRY & CO., Rockford, Illinois

Statement of the Ownership, Management, Circulation, Etc.

Required by the Act of Congress of August 24, 1912,

of "Better Fruit," Published Monthly at Hood River, Oregon
for October, 1917

State of Oregon,
County of Hood River, } ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared E. H. Shepard, who having been duly sworn according to law, deposes and says that he is the editor and business manager of "Better Fruit," and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, (and if a daily paper the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher, Better Fruit Publishing Company, Hood River, Oregon.
Editor, E. H. Shepard, Hood River, Oregon.
Managing editor, E. H. Shepard, Hood River, Oregon.
Business manager, E. H. Shepard, Hood River, Oregon.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding one per cent or more of the total amount of stock.)

Better Fruit Publishing Company, Inc., Hood River, Oregon.
E. H. Shepard, stockholder, Hood River, Oregon.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

(Signed) E. H. SHEPARD,
Editor and Business Manager.

Sworn to and subscribed before me this 13th day of February, 1918.

(Seal) ALTON W. ONTHANK,
Notary Public for the State of Oregon.
(My commission expires May 29, 1919.)

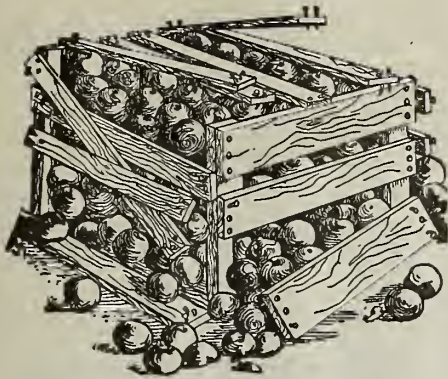
Government Inspection.—One of the best moves ever made in behalf of the vegetable grower and the fruit grower is being carried on in a number of cities in the United States. A list of the cities and the names of the inspectors is published elsewhere in this edition. In previous years the fruit growers and fruit-shipping concerns have been largely at the mercy of the man at the other end, if he is inclined to be otherwise than straightforward. By this system of Government inspection the fruit grower is given protection. If the Government inspector passes on the fruit the buyer is compelled to carry out his contract and does not have an opportunity of making a claim or rejecting on account of off-condition, if the Government inspection is O. K.

Codling Moth.—In this edition appears an article on "Trapping Codling Moth," by Alfred M. Wilson. Growers frequently have appreciated the value of banding the trees and killing the codling moth under the bands. Mr. Wilson's method is an improvement, as the trap holds the codling moth after they have emerged and prevents them from getting away. While the editor has never seen one of these traps and cannot say how successful they may prove to be, he is inclined to believe the suggestion is well worth trying, and therefore has published in this edition a contribution from Mr. Wilson showing how the traps are made, with the hope it may be a benefit to the fruit growers.

Spraying.—The spraying season for some diseases and pests will commence in March or April, according to the weather conditions. Ordinarily spray for San Jose scale should be applied late in March or early in April. The first spray for fungus should commence about this time; therefore if the fruit grower does not already possess a first-class power outfit he should buy one immediately. It does not pay to depend on hiring your neighbor to spray your orchard, because if you do he sprays his own orchard first and yours afterward, and yours is sometimes sprayed too late.

Pruning.—Strange to say pruning is one of the subjects the least understood by growers. Most growers have had a vague idea of what they ought to do, but comparatively few have had a complete understanding of just why they pruned in a particular way. The importance of thinning out and heading back in connection with production is very ably covered in an article by Professor V. R. Gardner, appearing in this edition. Professor Gardner's article is not one of opinion, but is founded on actual observation and practical experience.

Sugar.—All fruits contain more or less sugar. The system requires a certain amount of sugar, and the more fruit you eat the less sugar you will have to buy. What is equally important, the sugar in fruit is in a far more digestible form than ordinary sugar which you buy.



BEFORE using Cement Coated Nails

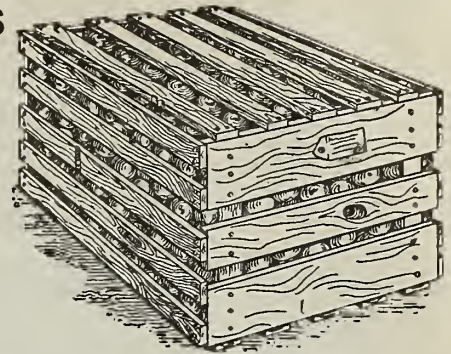
Western Cement Coated Nails for Western Growers

Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO
Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles



AFTER use of C. F. & I. Co.'s
Cement Coated Nails

A Rapid Method of Tree Planting

By Harry Gough, Maryland

SO many people make hard work of tree planting that I believe a description of my rapid and economical method will be of interest. I will describe how I planted a thousand fruit trees for Mr. L. B. Schram of Elberon, New Jersey, in April, 1913.

There were fifty stumps on the orchard site. These were disposed of by blasting. That part of the work was finished in less than a day. After the

field had been cleared, the ground was staked off to show where the trees were to stand. Cross furrows were then made with a plow, the intersection coming at the points where the stakes were set.

While the man was doing this plowing, I occupied my time in cutting fuse into 2½-foot lengths and in crimping each length of fuse onto a No. 6 blasting cap. As it was intended to use a

half a cartridge of dynamite in each tree hole, the cartridges were next cut in two. This is a very simple operation, although a good many people seem to be afraid to do it. Dynamite comes in heavy paraffined paper wrapping. Hold the stick in one hand, run a sharp knife around the center, letting the blade sink into the dynamite about a quarter of an inch all around. Then take one end of the cartridge in each hand and gently break it in two. Next insert the blasting cap to which the fuse has been attached in a hole punched in the side of the cartridge of dynamite and tie it in place. It doesn't do to insert the cap into the dynamite at the cut end because there is no way of tying it in place and it is almost sure to pull out when one attempts to put the charge into the bore hole.

A mark on the side of the punch indicated the depth of the bore holes and made it easily possible to get them of uniform depth. The charges were pushed to the bottom of the holes with a broom handle and the holes then tightly tamped with moist earth. The protruding fuse ends were then lighted.

After the holes had been shot, men followed who dug out the holes and filled them to the proper depth. Subsoil was used for the filling, the richer top soil being reserved to fill in around the roots. After that the earth was thoroughly firmed to prevent settling and to prevent wind from blowing the trees over.

By this method, a crew of four men were able to plant 1,028 trees. The planters followed the blasters so rapidly and worked so systematically that the planting was all finished within four or five hours after the blasting had been completed.

Although the trees were planted three years ago, there has been but one per cent of loss, which to me indicates that the beds were well prepared. The stump blasting and the tree planting required 320 pounds of a low-strength dynamite, 1,040 blasting caps, 60 electric blasting caps and about 2,600 feet of fuse. The total cost of the work, labor included, amounted to \$122, which Mr. Schram thought was decidedly cheap for the amount of work done.



SPRAYING HOSE

HAMILTON MADE

"THE STANDARD OF AMERICA"

Spray your trees with hose made to withstand the chemicals and acids which cause ordinary fruit hose to deteriorate quickly. Hamilton Fruit Spray Hose will give several years' service for one cost. Used by leading fruit growers who recognize Hamilton quality and ultimate economy.

½ in. Perfect Hose

In 50-foot pieces coupled. 6-ply fabric and fine rubber

½ in. Sterlingworth Hose

Reel Spray Hose in 500-foot lengths, the best.

\$15.00 Either kind will stand 600 pounds test. Satisfactory for any power or hand sprayer. \$15.00 for 100 feet. Cash with order.
for 100 FEET Express paid to your station. Shipments immediate.

HAMILTON RUBBER MFG. COMPANY
203 Meade Street, Trenton, N. J.

The Bushel Shipping Basket—The Universal Package

For Shipping All Kinds of

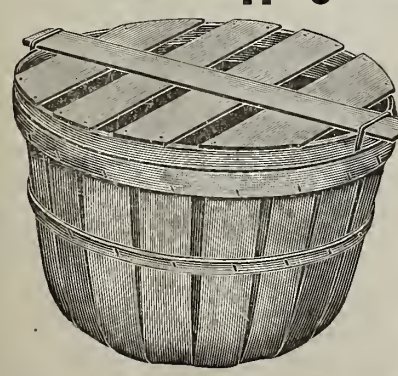
Fruits and Vegetables

Comes made up ready to use; is easy to pack, convenient to handle and delivers contents in best condition.

98% of Southern Peaches are shipped in these baskets.

WRITE FOR PRICE NOW

Package Sales Corporation
106 E. Jefferson St., South Bend, Ind.



Cold Storage Apple Holdings Feb. 1, 1918

By Charles J. Brand, Chief U. S. Bureau of Markets

REPORTS from 549 storages show that their rooms contain 2,202,808 barrels and 5,118,438 boxes of apples. The 513 storages that reported for February 1 of this year and last show a present stock of 2,091,636 barrels and 4,962,898 boxes, as compared with 2,121,206 barrels and 3,790,499 boxes last year, a decrease of 1.4 per cent in the barreled apples and an increase of 30.9 per cent in the boxed apples, which is the equivalent of the total increase of 361,229 barrels, or 10.7 per cent. For the purposes of this comparison, it is considered that three boxes are equivalent to one barrel. The 511 storages that reported for both December 1, 1917, and February 1, 1918, showed a decrease of 16.9 per cent in the barreled

apples and 12.3 per cent in the boxed apples, or a total decrease of 15.6 per cent during the month of January, while the 448 storages reporting their holdings for both December 1, 1916, and February 1, 1917, showed a decrease of 18.6 per cent in the barreled-apple holdings and 8.3 per cent in the boxed-apple holdings, or a total decrease of 15.3 per cent during January, 1917. As a few storages have not responded to our inquiries, this report does not include all holdings. Upon request any or all of the information contained in cold storage reports will be telegraphed immediately upon its release. These reports are free except for the telegrams, which are sent charges collect.

| | Number of Storages Reporting | Barrels | Boxes | Combined Holdings Expressed in Bbls.* | Comparison of Holdings on a Per. Basis |
|--|------------------------------|-----------|-----------|---------------------------------------|--|
| Holdings reported on Feb. 1, 1918..... | 549 | 2,202,808 | 5,118,438 | 3,908,954 | |
| Comparison of holdings— | | | | | |
| February 1, 1917..... | 513 | 2,121,206 | 3,790,499 | 3,384,706 | 100.0 |
| February 1, 1918..... | 513 | 2,091,636 | 4,962,898 | 3,745,935 | 110.7 |
| Comparison of holdings— | | | | | |
| December 1, 1916..... | 448 | 2,615,174 | 3,626,401 | 3,823,974 | 100.0 |
| February 1, 1917..... | 448 | 1,732,831 | 3,322,220 | 2,840,238 | 74.3 |

* Three boxes to the barrel.

COMPARISON OF HOLDINGS BY SECTIONS

| | Number Storages Reporting | December 1, 1917 | | February 1, 1918 | | Increase or Decrease |
|-------------------------|---------------------------|------------------|-----------|------------------|-----------|----------------------|
| | | Barrels | Boxes | Barrels | Boxes | |
| New England | 26 | 162,225 | 37,884 | 131,794 | 47,778 | -15.5 |
| Middle Atlantic | 106 | 784,117 | 506,821 | 493,951 | 907,322 | -16.4 |
| South Atlantic | 54 | 640,903 | 92,704 | 424,099 | 89,197 | -32.4 |
| North Central (E) | 95 | 766,620 | 522,945 | 613,796 | 717,017 | -9.4 |
| North Central (W) | 87 | 447,027 | 581,428 | 327,431 | 614,319 | -17.0 |
| South Central | 70 | 239,641 | 373,901 | 136,299 | 498,277 | -17.0 |
| Western (N) | 39 | | 1,343,046 | | 974,143 | -27.5 |
| Western (S) | 34 | | 968,760 | | 903,702 | -6.7 |
| Total | 511 | 3,040,533 | 4,127,489 | 2,127,370 | 4,751,755 | -17.8 |

PERCENTAGE OF DECEMBER 1 HOLDINGS MOVED FROM STORAGE

| MONTH | Season 1915-1916 | | | Season 1916-1917 | | | Season 1917-1918 | | |
|----------------|------------------|-------|--------|------------------|-------|--------|------------------|-------|--------|
| | Barrels | Boxes | Comb'd | Barrels | Boxes | Comb'd | Barrels | Boxes | Comb'd |
| December | 12.2 | 11.5 | 12.0 | 15.1 | 0.1 | 10.4 | 13.1 | 19.6 | 2.2 |
| January | 14.2 | 16.5 | 14.7 | 18.6 | 8.3 | 15.3 | 16.9 | 12.3 | 15.6 |
| February | 19.9 | 20.9 | 20.1 | 18.6 | 30.9 | 22.4 | | | |
| March | 20.4 | 18.1 | 20.0 | 19.4 | 28.1 | 22.2 | | | |
| April | 17.3 | 14.6 | 16.7 | 12.0 | 12.3 | 12.2 | | | |
| May | 12.2 | 11.5 | 11.9 | 11.3 | 15.1 | 12.4 | | | |

Distribution of Cars for Food and Feed

Director-General McAdoo and the Food Administration have arranged to co-operate in the distribution of cars for the food and feed trades: (1) The grain and grain product and feed shippers are to first apply for cars in the usual way through railroad agents; in case of not being furnished within a reasonable time they may then apply to the Zone Representatives of the Food Administration Grain Division at the

various terminals, stating the cars required, point at which it is desired cars should be set, character of the product to be loaded, the destination of shipment and the consignee. (2) The shippers of sugar, beans, rice, vegetables, live stock, meat and perishables generally, should first apply for cars in the usual way through railroad agents; in case not being furnished within reasonable time they may apply directly to the Food Administration in Washington, stating the cars required, the point to be set, the character of the commodity to be loaded, the consignee and destination. (3) Diversion of shipment in transit except for perishables will not be permitted from destination given by the shipper to the forwarding agent of railroad where cars have been placed and loaded on the specific request of Food Administration as outlined above. (4) The Food Administration does not undertake to secure cars nor can the Director General of Railroads in these uncertain times of blizzards and winter storms undertake to supply all cars applied for, but it is hoped that the new arrangement will

WANTED!

A wideawake, active man to buy one of the finest commercial orchards in Oregon, consisting of 70 acres of ten-year-old, clean, vigorous, full bearing apple trees. 42 acres Rome Beauty, 18 acres Gano, 10 acres Jonathan. Soil of highest quality. Good dwelling house, barn and frost-proof warehouse of 25,000 boxes capacity. Complete equipment, including one of the latest model Cutler Apple Grading machines. Everything ready for immediate possession and operation. A bargain if sold before May 1st. Will give terms.

For particulars address

**The United States National Bank
LA GRANDE, OREGON**

Fruit Buyers

"Caro Fibre" Fruit Wrappers
"Prolong the Life of Fruit"

Buy "Caro" Wrapped Fruit

Fruit Growers!

The above ad appears in the leading fruit buyers' journals throughout the United States.

Use Your Brains to Wrap Your Fruit
Take Advantage of Our Advertising

You can prove what we say. We can prove it by letters from the largest fruit buyers in the United States.

Use "Caro" Fibre

Print your own name on your fruit. Use our "slogan" on every wrapper: "This is a 'Caro Fibre Wrapper.' Caro prolongs the life of fruit."

Samples FREE at

Union Waxed Parchment Paper Co.
MANUFACTURERS

F. B. DALLAM, Sole Agent
112 Market Street San Francisco, California

HOMES AND FARMS



IN THE "SUNNY SOUTH"

Nature has blessed this favored section with mild, healthful climate, productive soil and all that makes life worth living. You can buy good farm land in Virginia, W. Va. and North Carolina at \$15 per acre and up. Fruit, truck, poultry and general farming will prove successful here. Write for information, illustrated literature, etc. F.H. LaBaume, Ag. & Ind. Agt., N. & W. Ry. 228 Ry Bldg. Roanoke, Va.

N. Z. Fruitgrowers' Federation, Ltd.

The Third National
Apple Show

WILL BE HELD IN THE

Harbour Board Store
Auckland

2nd to 4th, May, 1918

This Exhibition offers an
unique opportunity for
displaying
Orchard Requisites

For terms of Advertising in Catalogue
or exhibiting at the Show
apply:

THE EDITOR
Better Fruit Publishing Co.
Hood River, Oregon

give the Food Administration definite information, which it can give in turn to the Director General of Railroads for his assistance in the distribution of cars into the territories and trades of the most acute needs.

Farm Diary, Business Record and Account Book has just been published. The publishers state the book was prepared after the plan outlined by Mr. E. H. Thompson, Department of Agriculture, with an introduction by Mr. W. J. Spillman, Chief Office of Management, United States Department of Agriculture. The title page is a splendid recommendation for the book. The book is so arranged for keeping accounts of expense and receipts for each day of the year. Published by The World Book Company, Yonkers on Hudson, New York. Price \$1.50.

Government Inspection of Fruits and Vegetables

The Food Products Inspection Service is now available to shippers in the markets named below and it is expected that within the next thirty days the service will be established also in San Francisco, Denver, Detroit, Indianapolis, Atlanta, Birmingham, Buffalo and Omaha. Applications for inspections in any market should be addressed to the inspector in charge of that market, or to the Bureau of Markets, Washington, D. C.

- Baltimore, Maryland.—Washington office.
- Boston, Mass.—C. E. Merrill, Inspector, 408 Fidelity Building, 148 State Street.
- Chicago, Illinois.—B. B. Pratt, Supervising Inspector, 604 Distributors' Building, 236 N. Clark Street.
- Cincinnati, Ohio.—Howard E. Kramer, 307 Johnson Building.
- Cleveland, Ohio.—B. C. Butner, Inspector, 8 Exchange Building.
- Dallas, Texas.—Forth Worth office.
- Fort Worth, Texas.—L. G. Schultz, Inspector, 505 Moore Building, Tenth and Main Streets.
- Galveston, Texas.—Houston office.
- Houston, Texas.—Wesley V. Stephens, Inspector, 307 Southern Pacific Building.
- Jacksonville, Florida.—T. C. Curry, 909 Bisee Building.
- Jersey City, N. J.—New York office.
- Kansas City, Missouri.—F. E. DeSellem, Supervising Inspector, 202 Produce Exchange Building.
- Memphis, Tennessee.—L. J. Weishaar, Inspector, 804 Exchange Building.
- Minneapolis, Minnesota.—W. F. Selleek, Inspector, 300 Market State Bank Building.
- New Orleans, Louisiana.—F. H. Lister, Inspector, 314 Metropolitan Building.
- New York, N. Y.—E. L. Markell, Supervision Inspector, 707 Fruit Trade Building, 204 Franklin Street.
- Oklahoma City, Oklahoma.—F. A. L. Bloom, Inspector, Bureau of Markets.
- Philadelphia, Pa.—R. J. Russell, Inspector, 315 Insurance Exchange Building, Third and Walnut Streets.
- Pittsburg, Pa.—F. G. Robb, Inspector, 303 Kellerman Building, Eighteenth and Pennsylvania Avenue.
- Providence, R. I.—Boston office.
- St. Louis, Missouri.—Fred T. Bryan, Inspector, 400 Old Custom House, Third and Olive Streets.
- St. Paul, Minnesota.—Minneapolis office.
- Washington, D. C.—Supervision: W. M. Seott, C. T. More, Bureau of Markets.

The New Fruit-Fog Catalog IS READY!

Send Postal for Your Free Copy

This new catalog of Hayes Fruit-Fog Sprayers should be in every fruit grower's hands. It means thousands of dollars in added fruit yields.

Tells all about Fruit-Fog, the scientifically atomized super spray which is producing phenomenal yields by stamping out all hidden pests. Pictures and describes the complete line of

HAYES FRUIT-FOG SPRAYERS

including the highly perfected HAYES FRUIT-FOG GUN.

Send a postal at once for a free copy of this complete catalog. We will include "Successful Spraying," a guide that shows how and when to spray and what to use. Now being used by thousands of growers and by prominent agricultural schools. Mail the coupon at once! Get these books which tell how to increase your fruit yields by stamping out all hidden pests. There is no obligation. Write today!

HAYES PUMP & PLANTER CO.
Dept. K, GALVA, ILLINOIS



A Message for Fruit and Vegetable Growers

We desire to get in touch with Fruit and Vegetable Growers in all parts of the country in order to establish Fruit and Vegetable Drying Plants for single firms that want to build new and up-to-date drying plants for themselves and with two or more Growers that would favor the construction of a drying plant on a co-operative basis.

There are many millions of dollars worth of Fruit and Vegetables left to rotten on the ground and many more millions of dollars are paid in freight rates, tin cans and boxes that can and must be saved. We will invest some of our own capital, if you wish, as we are sure that it is to our mutual benefit, if you write us today for particulars. All information on this subject will be given cheerfully and free of charge. If you are in business for making the best profits write now.

The A. A. A. Evaporator Manufacturing Co., Inc.
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HOOD RIVER, OREGON

MANUFACTURERS
—OF—

**Lime and Sulphur
Bordeaux Paste
Miscible Oil**



YOU CAN EARN \$50.00 PER DAY WITH THE

Gearless Improved Standard Well Drilling Machine

Drills through any formation. Five years ahead of any other.

Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2½ gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.

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FRUIT LABELS**

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PORTLAND, OREGON.
E. SHELLEY MORGAN
NORTHWESTERN
MANAGER

WE CARRY IN PORTLAND,
STOCK LABELS FOR
APPLES, PEARS,
STRAWBERRIES
& CHERRIES

SEND FOR SAMPLES AND PRICES

OFFICE OF THE SECRETARY
ASSOCIATION OF NATIONAL ADVERTISERS,
INC.

Rochester, New York, December 1, 1917.

EDITOR BETTER FRUIT:

Perhaps it is because I was once a farmer and am now an agriculturist that I have been called into this matter, but, at any rate, I have promised Dr. Dunn, of the Conservation Department of the Fuel Administration, that I would write you, asking for editorial help. We want to get a message over to the whole people, impressing the necessity for the conservation of fuel. And we want to talk to every man in terms that he can understand, and that is why, instead of sending you a "mat" story, I am giving you some facts and suggestions and asking you, through your paper, to talk to your people.

The facts are that we need a hundred million tons of coal more than in a normal year. Production has been increased fifty million tons. There is, therefore, a fifty million tons shortage. The people can save that fifty million tons if they will. All classes of people are being asked to help. A kitchen shovelful of coal per day saved by every householder means an annual saving of twenty-five million tons. More careful firing can bring this about. Again, Americans, as a rule, have their houses super-heated. Sixty-eight degrees is the healthful heat. This will be preached. Americans keep their houses too dry. A pan of water on the stove or register, giving off a little moisture, will make for health and comfort at a considerably lower temperature than is agreeable in a dry room. Unused portions of the house should be closed off. Storm windows and weather strips should be used more than ever. In many cases a distinct saving can be made by the use of oil stoves. Hundreds of thousands of houses have fireplaces that can be used with wood on cold evenings instead of booming up the furnace. This will be widely advocated.

In many localities the farmers especially are in a position to conserve coal by burning more wood—perhaps in the kitchen. Where this can be done it makes a double saving: It saves coal and saves the coal that is burned to transport that coal, saves cars and engines that are needed for other work. There are dead trees, dead limbs and old rails that can be burned now to the betterment of the farm. There are trees that can be selected, that should be cut and piled now against next winter's shortage. In many parts of the country farmers can accumulate a surplus of such wood for next winter's use. Your readers can save money for themselves and help in the proper equipment and care of the boys "over there." May we hope for an early editorial from you, urging the present necessity upon them and impressing them with the fact that every little bit helps.

Your very truly,
L. B. JONES.

TREASURY DEPARTMENT
Internal Revenue Service,
Portland, Oregon.

I wish to inform you that I have been notified by the Treasury Department at Washington, D. C., that the time for filing the 1917 INCOME TAX RETURNS, including individuals and corporations, has been extended to April 1, 1918, thus giving an *additional month* to that provided by the War Tax Act of October 3, 1917. As soon as the blanks are received each corporation will be notified. I should greatly appreciate the EARLY filing of returns in order that the work of this office may not be unduly congested.

Very respectfully,
MILTON A. MILLER,
Collector.

War bread is wholesome, likeable. It saves for our Allies.

Mr. Fruit Grower:

The 1918 apple crop will, in all probability, be the largest yet recorded. Also, there is certain to be the greatest scarcity of labor yet experienced, especially of experienced packers and sorters.

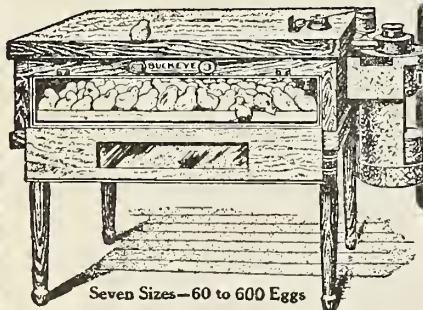
With a **CUTLER GRADER** you can teach inexperienced help to pack and sort and handle your crop quickly and at the least cost.

We are giving discounts for early orders and shipments.
WRITE NOW for circular and prices.

CUTLER FRUIT GRADER CO.

New Address: 351 East Tenth Street, Portland, Oregon

There is Profit in Poultry Raised by the "Buckeye" System



Seven Sizes—60 to 600 Eggs

BUCKEYE
HOT-WATER
Incubators
HATCH EVERY HATCHABLE EGG

Keep the
Lamp
Burning
and turn
the eggs.
The
"Buckeye"
does the
rest.

No experience needed to successfully hatch chicks in a "Buckeye." Maintains its temperature in any location, from freezing weather up to 100 degrees, and once adjusted **will not** vary.

You can heat any "Buckeye" to 103° in LESS THAN ONE HOUR and the temperature is guaranteed to be uniform to the fraction of a degree at all times

"Buckeye" Brooders

The new way. Raises bigger, better chicks at one-quarter the cost of old style brooders. Will brood 100 to 1,000 chicks. Can be set up any place and will burn coal, coke, gas, briquettes or charcoal. Nothing to wear out or break.



"Buckeye" Portable Brooders come in 3 sizes—60, 100 and 150 chicks—See Catalog

OUR POULTRY SUPPLY CATALOG lists everything necessary for the profitable production of poultry; tells how to care for and raise chickens—a useful reference for all who are interested in poultry.

Ask for Catalog No. 202

Manufacturers of
**Diamond
Poultry Foods**



Western Agents
**Lee's Foods
and Remedies**

For Sale

One Deming Power Sprayer, "Victory," three h. p. Novo Engine, Duplex pump, 200-gallon tank, two 50-foot leads of hose, pressure gauge and tank filler. Used very little; in good condition. Cost \$380.00. First check for \$175.00 gets complete outfit, f. o. b. this station.

A. F. PAGE
Stevensville, Montana



The Orchard Ladder of Quality

must bear the name "Northwest." Thousands are sold on their merits. Ask your dealer to let you see our ladder.

If your dealer does not carry our Ladder and Pruner in stock, write us direct for prices.

Information on our Orchard Supplies gladly given on request.



N. W. Fence & Supply Co.

PORTLAND, OREGON

A Pruner which does the work twice as fast as any other make, and costs no more. Why not use the best?

It's the Bastian



Prune Evaporation

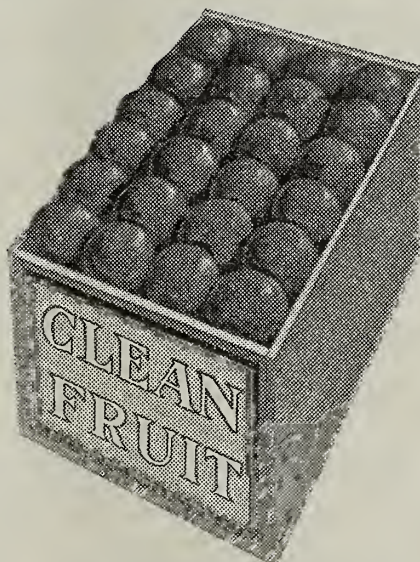
By F. R. Brown, Marion County Agricultural Agent, Salem, Oregon

A DISCUSSION of prune evaporation and all factors affecting such must necessarily commence with the harvesting methods. The normal season for harvesting prunes in the Willamette Valley is from September 10 to October 5. We find, however, that during the past few years there is an increasing tendency on the part of the growers to hurry the season. In other words, a great many growers are beginning as early as the 1st of September and finishing as early as the 25th, or ten days in advance of the normal season. With these facts before us, then let us consider the effect of this early harvesting. Through experiments carried out at the Oregon Agricultural College it has been found that the following figures are fairly accurate, showing the loss due to this early harvesting: There is a loss in weight of fresh fruit because the sugar contained increases very rapidly during the last three or four days that the prunes remain on the tree. Experience covering two years give the following figures: A loss in weight due to shaking 6 per cent. Since the sugar contained in the prune vitally affects the drying quality it is natural to find that prunes which are shaken from the tree dry lighter than those which drop naturally. The average difference over a period of three years shows a gain in weight in favor of prunes dropping naturally of 4.5 per cent. This means, then, that the grower annually loses 10.5 per cent of the weight of his dried prunes by harvesting too early. Add to this the cost of shaking, which runs from \$3.00 to \$6.00 per ton, and estimating the price on a basis of \$125 per ton of dried fruit, we find the total loss due to harvesting amounting to be from \$18 to \$20 per ton, or more than enough to pay the cost of cultivating, pruning and spraying the orchards. To further substantiate this fact, observations were made during the seasons 1912-14 and 1917, those seasons which were particularly noticeable on account of the difficulty experienced in getting the prunes from the trees. These observations reveal the following facts. First, that

after resorting to severe shaking and clubbing there still remained on the trees at the end of the season a number of prunes. An inspection, however, ten days later revealed the fact that not a single prune remained on the trees, but scattering prunes on the ground in-

dicated that at the proper time prunes dropped of their own accord.

Let us now take the question of tray-ing. There are many ways in connection with the tray-ing of prunes where greater efficiency can be obtained. For instance, it is found in one case by careful experiments and substantiated in many others by observation that enough rotten prunes were placed in the trays to show a net loss of \$2.73 per



The Final Test

Are you producing clean fruit at low cost?

This is the final test of your methods.

In the fall it is too late to repair errors.

Now is the time to review last season's results and plan for the future.

Latimer's Dry Arsenate of Lead

Will help you produce cleaner fruit.

We can convince you of this.

Use Latimer's Dry on only a part of your orchard the first year. Compare your results. Then you will know.

High combined arsenate makes Latimer's Dry quick to kill.

Extreme fineness gives covering power and adhesiveness.

Uniformity in composition assures uniform results.

The Latimer Chemical Company

GRAND JUNCTION, COLO.

THE NIAGARA DUSTER

The Labor Saver

**Use Only Niagara
Dusting Sulphur
AND
Dusting Mixtures**

They have been PROVED and approved by those who have made a success of dusting.

A leading fruit grower of White Salmon Valley (Washington) says: "It took three men fifty hours to apply one spray of liquid in my orchard, while two of us DUSTED it with equal thoroughness in eight hours."

Reports like these come from Hood River, Yakima, Wenatchee and every place where the Niagara has been used.



The Niagara Dusting Machines WITH NIAGARA DUSTING MATERIALS

are responsible for the

**Success of
Modern Dusting**

They make possible the best DISTRIBUTION in the most effective form.

**Niagara Dusting Machines
and Dusting Materials**

Are distributed from
supply stations at

**Oakland, Los Angeles
and Portland**

F. A. FRAZIER, Western Distributing Agent, 325 13th St., Oakland, California

Use **Niagara Soluble Sulphur** for **Dormant** and **Spring Spraying**

ton, due to the fact that after drying these must be picked out. When left in they injure the quality of the product. Another factor is the tendency not to fill the trays to their greatest capacity. This has been found to account for a loss in the drying cost of \$4.27 per ton. This is based on the fact that it costs just as much to send a tray through the dryer filled to 80 per cent of its capacity as it would to send it through completely filled. I was glad to hear Mr.

Nice Bright Western Pine **FRUIT BOXES** AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

Western Pine Box Sales Co.
SPOKANE, WASH.

True-to-Name Nursery

Offers for spring planting all leading varieties of apple, pear, cherry, apricot and peach trees.

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Portland Wholesale Nursery Company

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Wholesalers of Nursery Stock and Nursery Supplies

A very complete line of

Fruit and Ornamental Trees, Shrubs, Vines, Etc.

SPECIALTIES

Clean Coast Grown Seedlings

Oregon Champion Gooseberries and Perfection Currant

Write Now — Write Now

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

Paulus make the statement that the prune which has been lyed heavily does not process as nicely as do those dried without the use of lye. I have this same statement from all of the principal prune-packing plants in Oregon. From experiments carried out on a commercial scale we have found out that with proper drying methods the use of lye is not necessary and not only affects the processing quality of the prunes but the appearance and quality of the product itself. I think some steps should be taken to grade the prunes into two sizes before they go into the evaporator, since it is a well-known fact that the small prunes on the same tray with the larger ones will not dry in the same length of time. This means that either the small prunes will be over-dried or the large prunes under-dried, or both. In either case hand sorting will be necessary.

There are a number of factors which influence the evaporation of prunes. For the most part growers are content to base their conclusion as to the efficiency of any particular evaporator on the time required to dry a tray of prunes. This is not necessarily a correct basis, since the difference in drying time very often is not sufficient to warrant the difference in dried weight. In other words, since we are selling by the pound it would seem the more logical way to base our conclusions on the weight of dried fruit obtained from any given amount of green fruit. Climatic conditions assert a marked effect under our present conditions. Experiments

and observations covering a period from 1911 to 1917 shows that the average weight of dried prunes per bushel of fresh is 17 pounds for rainy seasons and 19½ pounds for dry seasons. Careful experiments during the same period brought to light the fact that where conditions could be controlled 20.3 pounds for rainy seasons and 24.4 pounds per bushel for dry seasons could be obtained. An average increase of 4.1 pounds per bushel, or 22.5 per cent. This is no doubt too high, but shows that a great saving may be made.

Spray Hose

"GUARANTEED" BRAND

Buy something good, it pays, If your merchants do not carry it, we will sell you direct, express charges prepaid, 25c per foot.

Gutta Percha & Rubber Mfg. Co.

544 1st Ave. So., SEATTLE

NOW is the time to send to

Milton Nursery Company
MILTON, OREGON

FOR THEIR 1918 CATALOG.

FULL LINE OF NURSERY STOCK.

"Genuineness and Quality"

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The effect of drying time on the drying percentage or weight per bushel is not very marked. For instance, a difference in drying time from 29 hours to 77 hours gave a difference in dry per cent of only 4 per cent in favor of the shorter time. There seems to be little or no difference in drying percentage so long as the drying time is kept below 30 hours and above 15 hours. An additional advantage of the shorter time is noted in the more attractive appearance of the finished product. In order to obtain a drying time within the limits noted above the following conditions were found essential: A temperature in the beginning not lower than 120 and preferably as high as 140 degrees. A finishing temperature not higher than 180 degrees and not lower than 165 degrees. The maximum temperature for the finish would depend largely on the circulation of air. At no time should the circulation of air drop below 660 feet per minute, and while we have no definite figures to give as to how high a circulation would be desirable, we have found that with the air circulation as rapid as 1,000 to 1,200 feet per minute, very excellent results were obtained. Another interesting fact in connection with the circulation of air is to the effect that the humidity of the air as it passes out is not sufficient to hinder its use a second, third or even greater number of times. In other words, there is no reason from a moisture standpoint why the air should not be returned to the furnace pit again and again. Since in most cases this could be returned at a temperature fully twice as high as that of the outside temperature. By reheating, with perhaps a small amount of new air added, a great saving of fuel would be made. The question in connection with this, however, is, can a means be obtained of returning this air to the furnace at a cost small enough to warrant its adoption? Summing up, then, some of the facts in relation to prune evaporation we find it possible to decrease our cost of harvesting and increase our profits by allowing the prunes to ripen more fully. We can make more attractive products by omitting the use of lye and substituting a more rapid circulation of air in the evaporator. Beyond this there is still considerable experimental work to be done, and we trust that the Oregon Agricultural College, with its new facility for carrying on the work, will be able to render some valuable assistance to the prune growers in the near future.

Order Spray Material Now

Insect pests and fungous diseases are always with us and must be combatted. Due to transportation difficulties and a possible shortage of spray material, growers are urged to consider their seasonal needs and order their insecticides and fungicides now. Traffic congestion and freight embargoes threaten seriously to interfere, if not largely to prevent the timely shipment of large quantities of fungicides and insecticides for use in seed treatment and early summer spraying and dusting.

Hook Up a "High Speed" Sprayer With Your Farm Engine

Has direct connection with engine shaft—no troublesome gears. Operates at the full speed of engine—from 450 to 550 strokes per minute. Maintains very high pressure—250 lbs.—enabling you to cover every inch of bark with a fine misty spray. The capacity—6 gals. per minute—makes it easy to spray a big orchard on time. Vacuum and air chambers insure steady flow of liquid. For real sprayer satisfaction, use

GOULDS SPRAYERS

HAND AND POWER

—50 styles. Our Service Department will guarantee every one to perform satisfactorily the work for which recommended. All rigidly tested and backed by 69 years' pump-making experience. "We also make a complete line of Power, Windmill and Hand Pumps for water supply and other services.

You need our free book, "Hand and Power Sprayers." Contains information of great value to every fruit grower. Write us today for your copy. Address Dept 44.

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Goulds Fig. 1662
"High Speed" Power Sprayer
—operates at speed of engine
—no gear reduction whatever.



Box Strapping and Tie Buckles

HOLD WHERE OTHER METHODS OF PACKING FAIL



Acme Steel Box Strapping in coils of 300 feet, 20 coils to a case. Larger coils of 3,000 feet. This strapping is used with nails and is lacquered finished.

Cold rolled flat wire, lacquered finish or galvanized, for use with tin seals. No nails used in this application.
Packed in bbls. of 500 lbs.



No. 4

Acme No. 4 Bale Tie Fastener, used with No. 17-18 round wire. Holds securely and has no prong to break off.
Packed 50,000 to a bbl.

Write for Catalog



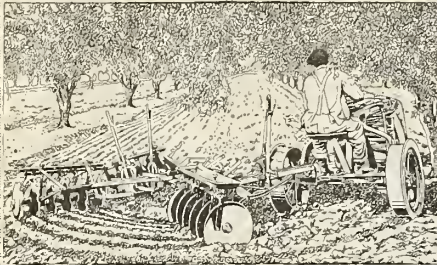
ACME STEEL GOODS CO. CHICAGO

Dot Embossed Strapping

Acme Steel Goods Co., Mfrs.

2840 Archer Avenue, CHICAGO

Branch and Warehouse, 311 California Street, San Francisco



**Right Back in the Same Row
and Right Up to the Trees
Under the Low Branches!**

**Patented
"Turning Feature"**

**Immensely Important in Orchard
Tractor**

Will the tractor you buy turn in a 10-foot circle (5-foot radius) *pulling as strong on the short turns as on the straight away*—and will it do that without *straining one side or one wheel*? That's of vital importance! Many tractors work well when pulling straight—it's on the *turns* that you will get *good or poor* service from your tractor.

The Bean TrackPULL Tractor is the *only small orchard-and-vineyard tractor made that delivers full power on 10-foot turns* and it turns without straining one side, pivoting, or doing anything else that a tractor shouldn't do.

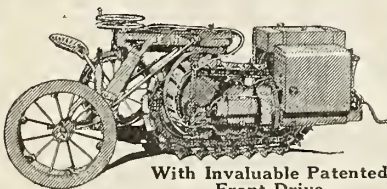
This remarkable machine is built on *patented FRONT-DRIVE principle*—you *steer with the single track* which does all the *pulling* whichever way you go. You can turn it back down the same row (see illustration above) without lifting out the tools making as *short* a turn as with a team!

Absolutely no other tractor acts so like a team while doing three times as much, is so handy, so efficient, so staunch, and so *protected against over-strain!*

You'll want the TrackPULL eventually—go see it now. Send coupon at once for catalog, complete description, and name of nearest demonstrating agent.

Don't buy a tractor that does less. Don't do without one that does so much. Send the coupon now.

**BEAN
TrackPULL Tractor**



**With Invaluable Patented
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Don't buy a tractor until you have mailed the coupon.

Bean Spray Pump Co.
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Send me catalog and full information without obligation on my part.

Name.....
Street.....
City.....
County..... State.....
No. of acres.....
Kind of crops grown.....

Both Prof. Lovett and Prof. Barss, Oregon Agricultural College specialists, think that growers had best order as early possible. Lead arsenate has practically doubled in price, and in many cases it may be advisable to substitute arsenate of lime (calcium arsenate). This material is satisfactory and safe when used properly. Representative samples of the material (one-half pound) should be sent to the chemist at the Oregon Experiment Station, Corvallis, for analysis and advice as to the dilution to use and the proper procedure when mixing.

Our Hour of Trial

Now is the hour of our testing. We must save, serve and sacrifice. If we are selfish or even careless, we are disloyal; we are the enemy at home! "Food will win the war!" Whose food, German or American? The world awaits your answer. We must save, serve and sacrifice.

The Task Ahead

Germany's greatest ally is the false belief in the United States that the war will be short. Face the grim facts. Prepare in your own home, in your business and in your community.

The war is causing a shortage of men in all classes of labor. The fruit grower should realize that it is not going to be as easy to secure men in 1918 as in former years. Therefore he should provide himself with all kinds of machines that will save the work of men, consequently the tractor should be thoroughly investigated by the fruit grower. Tractor-manufacturing companies which have made large tractors for farmers have realized for a long time the necessity of devising and building a tractor adapted to orchard work which is low down, so not to rub against the trees, and one that can turn around in the orchard without taking up too much room. During the last few years a number of tractors devised for orchard work have been put on the market. Growers who have used them state they are proving highly efficient and extremely economical, claiming that one tractor will do the work of several teams, so it seems wise to suggest that the tractor is worthy of favorable investigation by every fruit grower, especially those who have the largest-sized orchards.

On account of the shortage of labor and supplies it is wise of the fruit grower to order his grading machine early. Grading machines have proved efficient and economical. Those who have used grading machines have reduced the cost of packing very materially, which is variously estimated from three or four cents per box to seven or eight cents. Fruit growers will save extra money, and on account of the scarcity of men, the economy and efficiency of grading machines no fruit grower with a good-sized crop of apples should fail to use a grading machine in packing out his crop.

Technical Service in Spraying

ORTHO SPRAYS
CALIFORNIA SPRAY CHEMICAL CO.
WATSONVILLE, CALIF.

PAJARO VALLEY IS ONE OF THE CLEANEST HORTICULTURAL DISTRICTS IN THE UNITED STATES

This condition is due largely to the State and County investigations that have been conducted there by Mr. W. H. Volck.

Mr. Volck is now Director of Research of the California Spray Chemical Co., and his recommendations are of the highest authority.

Success in orcharding depends upon the orchard management, and one of the serious factors of orchard management is spraying. Expert opinion can be readily obtained by writing Mr. Volck.

ORTHO DRY Arsenate of Lead, in competition with other brands, received the highest award ever conferred on sprays at any exposition.

ORTHO DRY Arsenate of Lead is a light, finely divided powder, equally suitable for either wet or dry application. The convenience and ease of handling should recommend it to any progressive fruit grower; only half the weight to haul; no rubbing or or mixing; just put it in the tank and start the agitator.

ORTHO DRY Arsenate of Lead has been used in all the fruit growing districts of the Pacific Coast, and has an army of friends who maintain that it is vastly superior to any other lead arsenate.

Successful control of pests depends largely upon the sprays used. You get the best results when you use **ORTHO DRY** Arsenate of Lead.

California Spray Chemical Co.
Seattle—Watsonville—New York



Here's one of the times when a fellow feels thankful to the friend who sent him that pouch of Real Gravely.

Send Him a pouch of Real GRAVELY Chewing Plug

Real Gravely Chewing Plug—there's the soldier's tobacco, that he can use anywhere, anytime. Just a small chew of Real Gravely is enough—all good tobacco, rich, sappy leaf made the Gravely way, not loaded up with heavy sweetening like ordinary plug.

Give any man a chew of Real Gravely Plug, and he will tell you *that's* the kind to send. Send the best!

Ordinary plug is false economy. It costs less per week to chew Real Gravely, because a small chew of it lasts a long while.

If you smoke a pipe, slice Gravely with your knife and add a little to your smoking tobacco. It will give flavor—improve your smoke.

SEND YOUR FRIEND IN THE U. S. SERVICE A POUCH OF GRAVELY

Dealers all around here carry it in 10c. pouches. A 3c. stamp will put it into his hands in any Training Camp or Seaport of the U. S. A. Even "over there" a 3c. stamp will take it to him. Your dealer will supply envelope and give you official directions how to address it.

P. B. GRAVELY TOBACCO CO., Danville, Va.

The Patent Pouch keeps it Fresh and Clean and Good
—It is not Real Gravely without this Protection Seal
Established 1831



Thinning-Out and Heading-Back in the Apple Tree

By V. R. Gardner, Oregon Agricultural College, Corvallis, Read Before the State Horticultural Society of Washington, January 4, 1918

DURING recent years few topics pertaining to fruit growing have been discussed more frequently and at greater length than that of methods of training fruit trees. So much has been said and written about the supposed advantages of the open-centered tree as compared with the "leader" type of tree, and vice versa,

that it would seem that this question would be practically settled, and that difference of opinion regarding it would no longer exist. Unfortunately this assumption is not borne out by the facts; for probably there never was a time in the history of fruit growing when growers were more completely divided on this question. If this is true regarding a question that has been discussed so often, it is not surprising that there is much uncertainty in the minds of growers when it comes to questions of methods of pruning fruit trees, questions that have received comparatively little attention in the horticultural press and that have been touched upon but casually at such meetings as this. This last statement may seem a little surprising to some; but it will be noted that two distinct terms, applying to two quite distinct practices, have been used—training and pruning.

At the outset it will be well to make clear the difference between these terms, for this article deals almost exclusively with the one and hardly at all with the other. Furthermore, it is believed that one of the main reasons for so many conflicting ideas regarding pruning is the failure to distinguish between training and pruning. Training includes those practices that in one way or another tend to develop or modify the general shape of the tree; on the other hand, pruning includes those practices that aim to modify function—what the tree does, as opposed to what it looks like—through the removal of parts. This does not mean that function is absolutely independent of form. Without doubt the two are to a certain

degree inter-dependent, though this degree is probably much smaller than is commonly imagined. As a matter of fact, the two sometimes may be entirely independent. It would be possible to train a tree on a trellis much as we train American varieties of grapes, and that without a bit of pruning. Likewise it would be possible to prune a

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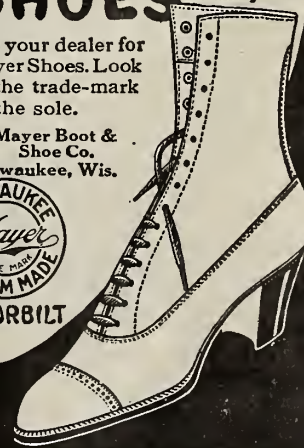
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tree lightly or even severely without changing its shape in the least. As a matter of fact most training effects some change in function and most pruning effects some change in form. Nevertheless, it will simplify an analysis of the facts and make easier the reaching of correct conclusions if the two operations are kept separate in the mind.

It has been stated that this article deals with pruning and not training. At this point it will be well to call attention to the fact that pruning necessarily must consist in a thinning-out or a heading-back of new or old wood, or both. That is pruning is necessarily of one or another or both of two kinds. The difference between these two kinds of pruning is pretty well explained by the terms used to indicate them. Heading-back removes a part of a limb or branch or shoot, leaving more or less of a stub from which new growth may reasonably be expected to spring. Thinning-out removes entirely a limb or branch or shoot, leaving no stub from which new growth may spring. Thinning-out cuts off down to a larger limb or branch or to a strong lateral. It is with the different results attending these two operations that we shall now concern ourselves.

Heading vs. Thinning Shoots

The first effect of any ordinary pruning operation is to reduce the number of buds, the number of active growing points. Let us see how equally severe heading and thinning operate in this respect. For example, a 50 per cent thinning, a thinning that removes one-half of the shoots, would remove just one-half of the buds. An equally severe heading would remove one-half of the lateral buds on each and every shoot and all of the terminal buds. This would result in a somewhat greater total bud reduction than the thinning, incidentally preventing any new shoot growth arising the following year from terminal buds. However, this difference in the number of buds left following these two kinds of pruning is comparatively small.

Careful experimental work indicates that the total amount of new shoot growth produced by a headed shoot is on the average not greatly different from that which would have been produced by the shoot if it had not been pruned. In other words, heading an individual shoot is neither much of a stimulus to, nor a check upon, new shoot production. Varieties vary considerably in this regard, but in general the statement will hold. Furthermore, thinning of shoots does not tend greatly to make those remaining produce much more new shoot growth than they otherwise would have produced in the unthinned tree. In some varieties thinning tends to increase the number of new shoots for each old one remaining, but they generally remain enough shorter so that the total amount of new growth remains about the same. The general effect of these two kinds or methods of pruning upon the new shoot growth of the tree, then, is to reduce it

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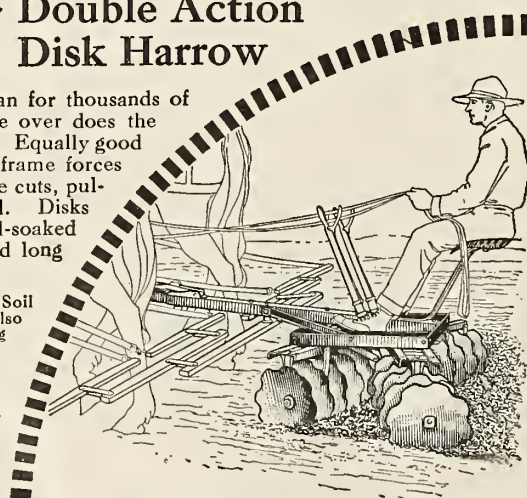
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materially in the one case and to not change it materially in the other.

Fruit spurs develop from lateral buds on shoots. Ordinarily not all lateral buds on shoots develop into spurs. As a matter of fact some lateral buds generally develop into side shoots; still others remain dormant. Examination of the condition presented by the two-year-old or older wood of almost any bearing apple trees reveals the fact that normally the buds on the lower part of the shoot remain dormant; those well out toward the end are the ones that develop into shoots; and those along the middle of the shoot or between its middle and outer end are the most prone to form fruit spurs. The upper ones grow out into shoots and spurs because they are larger and plumper; they are larger and plumper because they, or more accurately the leaves that subtended them, were better supplied with light and consequently better nourished the preceding season. With these facts in mind let us see what the effect is upon spur formation of heading-back shoots. In the first place it is noted that heading removes practically all of the buds that normally would have produced new shoots. But new shoots are formed in as large numbers as before. Consequently buds lower on the shoot that otherwise would have developed into spurs are forced out into shoots. This automatically reduces still further the number of new spurs unless the heading forces the development of fruit spurs from the weak buds near the base of the shoot that normally remains dormant. Examination shows that very few of such weak buds are actually forced out by the heading-back, and those that do push out generally develop into weak shoots instead of spurs. Thus, the effect of heading-back is to reduce fruit-spur formation. If the heading-back is light the reduction is not a serious one; but if it is severe it may result practically in preventing it. On the other hand, an equally severe (say a 50 per cent) thinning of shoots leaves all those buds on the unpruned shoots. Furthermore, it does not force the development of new shoots from buds that usually would produce spurs. The result is that while it somewhat reduces new spur formation, it is much less of a check to it than equally severe heading.

However, the fruit grower is interested not only in fruit-spur production but in fruit-spur functioning as well. A tree with a thousand strong, vigorous, productive spurs is probably worth just as much, if not more, to the grower than one having twice that number of spurs, but half of them weak and unproductive. Therefore, the question arises as to the comparative influences of heading-back and thinning-out upon the behavior of already established fruit spurs. What a spur will or will not do in the way of fruit bud and flower production depends very largely upon the supply of elaborated food materials present—food materials classed by the chemist as carbohydrates, and including the starches and sugars. In the presence of relatively large quantities of these food materials fruit buds

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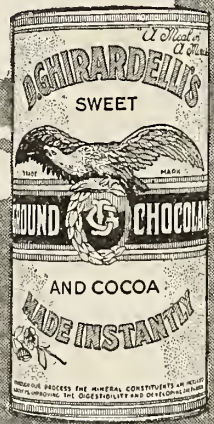
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are formed. If they are not present during the period of fruit-bud formation (under our conditions July and August for most apple varieties) the fruit spur remains vegetative—that is, it produces a terminal leaf bud and does not flower. Recent investigations carried on by the Oregon Agricultural Experiment Station indicate clearly that to a very large degree each individual spur is dependent upon its own resources for its supply of elaborated food. That is, each spur must manufacture in its own leaves the carbohydrates that it uses. It cannot draw any considerable quantity from neighboring spurs or from adjacent shoots. Plant physiology teaches us that the manufacture of starches and other food materials in the leaves is almost directly proportional to light supply, other conditions remaining the same. This means, then, that if the spurs in the two-year-old and older wood are to set fruit buds freely they must have an abundant supply of light. As has been pointed out, thinning-out of shoot growth admits more light to the interior of the tree, to the region of the fruit-spur system. On the other hand, heading-back the shoot growth tends to make the tree more compact and bushy, and thereby tends to decrease the light supply available to the fruit spurs. Thus it is seen that these two pruning practices tend in opposite directions so far as their influence upon fruit-bud formation is concerned—thinning-out making the trees more productive and heading-back making them less productive of fruit buds.

It is generally recognized that the color of apples is dependent to a very large extent upon the amount of sunlight that reaches them previous to and during their ripening season. Apples that are more or less completely shaded develop into second or third-grade apples, if color enters into the grading rules. After what has been said, the relative influences of thinning-out and of heading-back shoots upon the coloring of fruit will be obvious.

Heading vs. Thinning Two-Year and Older Wood

Thus far the discussion has been limited to a consideration of the influences of heading and thinning shoots only. In the pruning of older trees we have to deal with two-year-old and older wood. The question may well be raised as to the comparative effects of thinning and of heading these older branches. Let us analyze the situation briefly. It is obvious that either heading-back into, say, a three-year-old growth or cutting it out entirely (thinning) would remove all the shoot growth that it produced the past season. Therefore, the two operations would effect exactly the same reduction in lateral and terminal leaf buds on shoots. Theoretically, then, the two operations should have the same effect on new-shoot formation and upon new fruit-spur formation—greatly reducing both. Probably the effects of the two operations are almost identical in their check to new-spur formation; but in many cases such a heading-back would

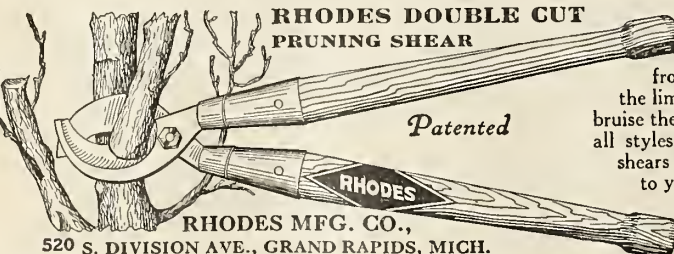
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not result in such a complete check to new-shoot growth, for the stub left is very apt to produce new shoots, or watersprouts, from dormant or adventitious buds. These watersprouts may fall short of, or may exceed in amount, depending upon conditions, the shoot growth that normally would have been produced from the new wood (shoot growth) of the headed limb. On the other hand, thinning of older wood is not apt to stimulate the production of such new-shoot growth.

It is evident that a thinning of two-year-old or older limbs will result in admitting to the interior of the tree a larger amount of light than would result from a heading of the same limbs. Heading-back into two-year-old or older wood may operate to let a larger amount of light into the tree than would be able to enter were no pruning afforded, but it is plain that it opens up a tree to a much less extent than a corresponding thinning. This being true, it is reasonable to expect the fruit spurs left in the tree to respond much more directly to a thinning than to a heading of the older limbs. Naturally this response is found in increased vigor and in greater fruit-bud formation. Furthermore, the fruits that develop in the interior of the tree will be better colored on account of their better supply of light.

Application to Pruning Practice

From what has been said it might be inferred that thinning only is to be recommended, because thinning exerts a much more favorable influence than heading upon the production of fruit spurs and fruit buds and upon the coloring of the fruit. However, these are not the only things in which the grower is interested. There are many other features of tree growth that must be given proper consideration. It is possible that at least some kinds of thinning might be carried to such an extreme that the result would be a very "rangy" tree, a tree unable to support its fruit without an undue amount of propping. Here is where attention must be given to the matter of training—to the question of form or shape.

Nevertheless, the principles that have been brought out have a bearing upon pruning practice; and they must be kept in mind constantly if the best possible results are to be obtained. Some trees, particularly those just coming into bearing, trees from four to eight years of age, have too few fruit spurs to bear the size of crop they could easily carry. With them the method of pruning to employ is one that will develop quickly an adequate fruit-spur system. Other trees, young or old, possess enough spurs for heavy fruit production, but they are weak and vegetative. They do not produce fruit buds and flowers. With them the pruning treatment should be such as will invigorate and make more productive the spurs that they possess. Still other trees, generally those that have been in bearing a number of years, have too many fruit spurs—more than they can care for properly. These spurs rob each other of food and water and, more especially,

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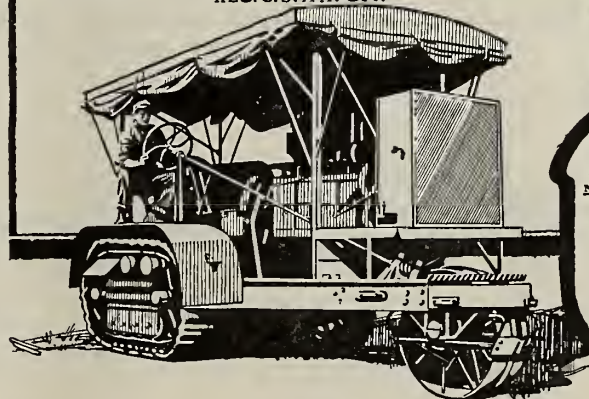
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light. The method of dealing with this problem is obvious. Other old trees continue to produce good crops each year, but the bearing is rapidly shifting from the center of the tree to its upper and outer portions so that great strain is put upon the limbs and crotches by the load of fruit. There still are spurs in the interior of the tree, but they are weak and unproductive. The problem is to make them productive again and thus to shift a part of the load to a location where it can be held better and thinned, sprayed and picked more economically. No one pruning practice, as, for instance, thinning-out or heading-back is the means of solving all these problems. It may take thinning-out alone to handle one of them, heading-back alone to handle another, a certain combination of the two to handle a third, and a still different combination to handle the fourth. The thing to remember is that one series of results is reasonably certain to follow the one practice and that a quite different series of results will follow the other practice. The wrong pruning practice for any of the problems presented is apt to make conditions worse rather than to improve them.

As a kind of practical summary to what has been said the following suggestion is made. As each tree is approached by the pruner or by the person who is to decide upon the pruning treatment it is to receive these questions should at once occur to him: (1) What is needed to develop further or to correct its form? What does it need in the way of training? (2) Does it possess too few or too many fruit spurs? (3) Are its fruit spurs, particularly those in the lower and interior portions of the tree, strong and vigorous and sufficiently productive? With each of these questions in their turn answered correctly and with a knowledge of how the two pruning practices that have been discussed operate to influence shoot, fruit-spur and fruit-bud production, it is believed that approximately correct training and pruning may be done—pruning that will make the tree and efficient producer of high-grade fruit.

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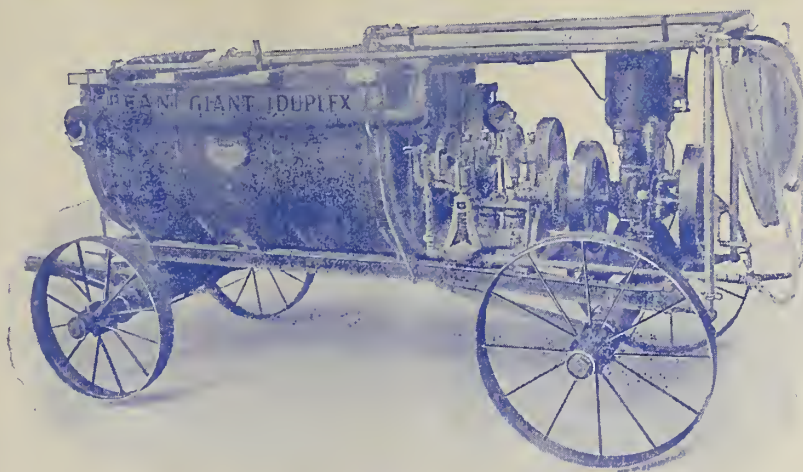
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