

EFFICIENT FARMING

SPRAYING POTATOES FOR LATE BLIGHT

Late blight and rot is the most destructive disease of potatoes and in some years causes tremendous losses. The potato leaves are the factories in which the starch is manufactured, later to be stored in the tubers produced underground. Should these factories be impaired in any way the yield must necessarily be reduced. In the case of late blight, loss results both from the blighting of the leaves and the consequent failure of the tubers to attain their normal size, and by the rotting of the tubers which follows an attack of the disease. These losses can be greatly reduced, if not entirely prevented, by careful and thorough spraying with Bordeaux mixture. Applications of this spray should be given whether the crop is being grown for "seed" or for table stock.

Careful experiments conducted over many years have demonstrated that the best spraying solution to use is home-made Bordeaux mixture, of the 4-4-40 strength. The most convenient method of making this mixture is by the use of concentrated stock solutions of copper sulphate (bluestone) and lime, diluting them as required. These solutions are prepared as follows:

(1) Bluestone stock solution: This is prepared by dissolving 40 pounds of copper sulphate in a barrel containing 40 gallons of water. A convenient method is to place the chemical in a sack and suspend it over night in the barrel of water just below the surface. A more rapid method is to crush the bluestone crystals and dissolve it in a smaller quantity of hot water and make up to 40 gallons. Each gallon of the solution will then contain one pound of bluestone. Metal vessels must not be used in handling this chemical.

(2) Lime stock solution: Slake 40 pounds of fresh quick lime in a barrel by gradually adding water. Mix thoroughly and continue to add water until the barrel contains 40 gallons.

In order to keep out dirt and prevent evaporation, the barrels containing the stock solutions should be kept covered. To make up a tank of spray ready for use, transfer four gallons of the stock solution of bluestone into the spray tank and add 32 gallons of water. To this dilute solution add 4 gallons of the lime stock solution. This should be poured through a fine mesh strainer to remove all solid particles, otherwise clogging of the nozzles will result. The solution in the tank should be kept thoroughly agitated while the lime is being added. The tank now contains 40 gallons of Bordeaux mixture.

If the above directions are carefully followed the resulting solution will usually contain the proper proportions of bluestone and lime, but since the composition of lime often varies it is preferable to test the mixture in order that the foliage may not be injured by an excess of bluestone. A testing solution may be prepared by dissolving one-half ounce of potassium ferri-cyanide in one-half pint of water. This material is a poison. Sprinkle a few drops of this re-agent onto the surface of the spray mixture, and, if on striking the surface of the solution, a distinct brown color results more lime should be added to each 40 gallons of solution for the control of potato beetles.

Commence spraying about the middle of July and repeat every two weeks throughout the season. When the plants are small 60 gallons per acre will be sufficient. This amount should be increased as the plants grow larger. The sprayer should be equipped with three nozzles at each row—two side nozzles pointing slightly upward and one pointing downward—so that both upper and lower surfaces of the leaves will be thoroughly protected. The spray should be applied under a pressure of 125 to 200 pounds. At least four applications are necessary during the season, but five or even six will usually be found preferable. Particular attention should be given to the later applications. If these are neglected or are carelessly applied a late attack of late blight may cause more damage than if no spraying had been done. In the later sprays the proportion of copper sulphate should be increased, using the formula 6-4-40. That is, add six gallons of the stock solution of bluestone instead of four, and 30 gallons of water instead of 32.

Bordeaux mixture will also control early blight and tipburn, and will act as a repellent for the potato flea beetle.—J. B. MacCurry, Plant Pathologist.

USEFULNESS OF COVER CROPS.

Cover crops in an orchard are an essential part of good orchard practice. As the maintenance of humus or organic matter in the soil is necessary to retain proper physical condition, and as manure is becoming more difficult to obtain, and can be used probably to better advantage on other parts of the farm, cover crops fill a very useful purpose in this direction alone. Crops that will make a good growth serve to increase the humus in the soil, but by selecting a leguminous crop such as clover, vetch or peas, not only humus is added, but also it may

be possible to increase the nitrogen content of the soil, thus obtaining a two-fold advantage from the cover crop.

In the colder part of the country, where well ripened wood of the tree is necessary to ensure a chance of proper wintering, it is considered necessary to utilize a cover crop in conjunction with the clean cultivation system. For this purpose the crop is sown about June 30th, allowed to grow all summer and fall, and plowed under the following spring. The cover crop will thus draw upon the soil for moisture and food at a time when the trees should be ripening its wood, and will also serve as a means for holding snow, thus assisting in protecting the roots of the trees from severe conditions.

The use of cover crops in connection with bush fruit plantations has not been developed to any appreciable extent, but with the growing scarcity of manure there seems to be no reason why a combination of fertilizers and cover crops could not be adopted as good practice on areas where raspberries, currants, and gooseberries are being grown at proper distances. Such a combination offers many advantages, where cost of regularly applying manure is becoming prohibitive.

Following are some of the more important crops used for this purpose: Leguminous: red clover, crimson clover, summer vetch, field pea; non-leguminous: buckwheat, rape.

Live Stock Market Situation.

Although extreme top prices for cattle were rather lower at the principal markets in Canada during the month of May than in the corresponding month last year, as shown by the Dominion Live Stock Branch reports, there was an encouraging improvement over the condition of affairs in the preceding month. An extract from the report reads: "Despite the comparatively heavy weight of receipts, the quality of the butcher and export stock was of such a good character, and the demand for good stock so keen that the range of prices was increased by 50c to \$1.25 per hundredweight. In the West there was a weaker tone at the close, whilst heavy cattle were inclined to drag, but in the last, good quality stock held reasonably steady. There was a continued strong demand for good quality stock suitable for finishing for the British market and the domestic beef trade, in view of the steady increase in the movement to the seaboard. Short keep feeders appeared to be very popular with eastern farmers, who paid as high as \$7.75 and generally \$7 per hundred."

Relative to hogs, the report says that receipts and through billing show an increase to date this year of 150,000 over the same period in 1922. The supply was considered heavy for May, with the export bacon market showing considerable price reduction on account of heavy Danish killings, and consequent difficulty in clearing.

Prices on spring lambs, opened strong in May when few were offered, but as supplies increased, quotations became lower. The top at Toronto was \$20 compared with \$19 in May, 1922, and \$17 in the immediate April. Montreal high was \$18 against \$20 in May, 1922, and \$12.25 in April this year, and Winnipeg top, \$13.50 against \$16.50 last year and \$13.25 in April.

Exports of cattle, calves and sheep have been larger this year than last. From January 1 to May 31, 19,956 cattle were exported to Great Britain and 21,874 to the United States, compared with 3,563 and 9,355 respectively during the corresponding period last year. Export of meat this year up to the end of May was 9,888,900 lbs., against 7,750,400 during the same period last year. Bacon and pork exports were also larger.

Movements of Live Stock.

This year to date, compared with the same period last year, sales of live stock have totalled at the five principal markets as follows: cattle, 307,228, against 256,671; calves, 115,220, against 126,493; hogs, 502,429, against 392,474; sheep, 87,725, against 109,209. It will be noticed that there has been an increased sale of cattle this year compared with last year of 50,557 and of hogs of 109,955, and a decrease sale of 11,273 calves and 12,484 sheep. This situation it will be found is reflected in the prices, hogs in particular having gone down. Billed through, this year compared with last year, there have been 68,153 cattle against 51,085; 353 calves against 355; 78,633 hogs against 26,886, and 17,645 sheep against 21,213; an increase of 17,068 cattle and 51,747 hogs and a decrease of 2 calves and 3,569 sheep.

The fire loss in the United States last year due to matches and smoking amounted to \$25,992,000, against \$16,436,000 in 1918. The insurance men are inclined to believe that the big increase in women smokers may have caused this terrific increase in the fire loss.

The Growing of O.P.V. Silage.

If mixed farming is to be followed in Northern Ontario, and the keeping of live stock to build up the fertility of the soil a cheap and succulent feed must be available to bring them through the winter. Up to the present time it has been found at the Kapuskasing Experimental Station that O. P. V. is one of the best feeds for this purpose, although greater tonnage has been obtained from sunflowers, and at a much less cost of production. The O. P. V. has its advantages over sunflowers, as it can be sown at a much later date, requires no intertilling, is a much more satisfactory crop to handle under field conditions, can be cut by the binder and the blower will handle the full size sheaf from the wagon, where it can be fed to the blower as fast as it can be taken care of. When it is cut at the proper stage for silage purposes it makes a very succulent feed and is readily eaten by stock of all kinds. When the oats are at the dough stage, and the peas well formed, is the proper time to cut and ensile, right from the binder if possible.

It has been found that when shrinkage takes place there is over-fermentation in the silo, with resultant musty silage. At the Station it is usual to keep a light stream of water in the blower and excellent results have always been obtained, but care must be exercised as too much water will cause injury. O. P. V. generally grows very rank under favorable conditions, and smother weeds of any kind; and early fall plowing can be carried on when the crop is removed, which is a great advantage in the north owing to the short season in which to do the work. Every advantage must be taken of silage crops that mature in time for fall plowing to be done, and O. P. V. has the advantage over both corn and sunflowers in this respect.

O. P. V. will grow to maturity in from 90 to 100 days under good growing conditions. As sunflowers and corn take a much longer period to fully mature, the harvesting and silo work is extended into really cold and unpleasant weather; and where fall plowing is as essential as it is in this region this is a big handicap. The clay soil is much easier to work when fall plowing is done, and it also means earlier seeding, which is equally essential where such a short growing season obtains for the cereals which follow a hoed crop. This crop can be highly recommended for the settlers of the clay belt. Where they have no silo it can be cured as hay, makes good feed for live stock and will bring them through the winter in good shape.

Spare the Whitewash and Spoil the Tree

BY J. B. McFARLAND.

Those old, old apple trees you saw along the road in your neighbor's orchard which his grandfather planted so long ago; did you ever stop to examine them? Did you notice how the southern and western sides of the trunks were decayed, gnarled and of an unhealthy color, while the northern and eastern sides were comparatively good? If the trunks of those trees had been protected from the sun these past years they would be sound to-day.

Nature did not intend the trunks of those trees to be in such a deplorable condition at the age they are. Nature caused the limbs of the trees to spread down and out so the foliage would shade that portion of the tree. Grandfather, through necessity, pruned those protective limbs away so he might plow closer to the tree. Then the trunk, felt the first stages of decay set in.

The sun seared the tender bark of the tree trunk. The sap, flowing just beneath, was checked on its journey to the leaves. The bark began to peel, crack and check into furrows where dampness held. These damp furrows furnished a culture place for the spores of one or more kinds of fungi which came quickly and began to send their "roots" into the tree to rob it of sap and destroy those cells functioning as sap conveyers. These destroyed cells formed a place where a moth deposited a nest of eggs. The mother moth, new that when the larvae hatched the healthy cells adjoining would furnish a continuous meal for the larvae.

THE BEST PROTECTION.

There are many ways to protect the trunk and unshaded limbs of a tree. Nature does it with foliage, but when grandfather cut those limbs away to facilitate cultivation Nature was defeated. If grandfather had applied whitewash or had taken paper, corn-stalks or an old sack and wrapped it around the trunks, those trees would now be strong, healthy and vigorous.

More and more orchardists are using whitewash as a protection for their trees against sunburn and insect enemies. Whitewash has many merits to recommend it—its inexpensiveness, ease of application to any desired part of the tree and its value as an unnatural surface which insects abhor.

Then, too, a whitewashed tree is cooler than one without a white covering. The sun's rays are reflected and not absorbed as in the case of a darker surface. One authority says that there is a difference of at least

10 degrees. Extreme heat is depressing to growth.

Whitewash formulas and recipes are numerous, each locality having one or more considered standard because of its proved worth. It is not the object of this article to dissuade any person from using what they consider a good whitewash. There have been numerous objections made to the slaked lime whitewash because of its disinclination to stick for any length of time to a smooth surface and because of its preparation.

Of the many recipes tried for making a good whitewash the following has proved the best for one orchardist who washes more than 5,000 trees each year: Carpenter's glue—dry chip glue; outside white cold-water paint; lead arsenate; bluing.

To one and a half gallons of water add a generous handful of the glue. Put on the fire and heat until the glue is dissolved; stir occasionally to keep the glue from sticking to the receptacle. Set to one side and allow to cool.

THE SECRET.

Take three quarts of the dry cold-water paint and add a heaping tablespoonful of powdered arsenate and mix the two thoroughly. Now pour clear water into the dry powder until the mixture is the consistency of thin batter-cake dough. The whole secret of this whitewash is to add the water slowly and mix thoroughly until every particle of the powder has been dissolved.

Now add seven or eight tablespoonfuls of the glue which has been reheated back to its water thinner, stir quickly for a half minute and add the equivalent of a half ball of ball bluing which has been dissolved in water. The availability of slightly warmed whitewash should now be tested with a soft clean brush, a regulation paint is preferred. If the mixture flows and leaves a coating very similar to a good oil paint it is ready for application.

The reason the lead arsenate was added to this mixture was because of the hundreds of insects that dislike a

The Sunday School Lesson

JULY 29.
Matthew the Publican, Matthew 9: 9-13; Luke 5: 27-32.
Golden Text—I came not to call the righteous, but sinners.—Luke 5: 32.

LESSON SETTING—This week we study the life and character of Matthew. In the Gospels of Mark and Luke he is called Levi. This is accounted for by the fact that the Galileans had of a strictly Jewish name (Levi) and a Galilean name (Matthew).

I. MATTHEW, THE DESPISED PUBLICAN, MATT. 9:9A.

V. 9a. As Jesus passed... from hence, Jesus had been in Capernaum, where he had healed the paralytic borne of four friends. In the course of this miracle he had rebuked the scribes and Pharisees in fearless fashion. From this time onward the scribes lost no opportunity of accusing Jesus wherever they thought they saw an opportunity. Saw a man, named Matthew. Seeing men was with Jesus more than a physical and mental action. It was a spiritual estimate, an unerring moral judgment. Sitting in the places of toll (Rev. Verger). The Roman government did not collect taxes directly. Wealthy capitalists undertook to raise the revenue from the different provinces and districts. What they raised over and above the pay to the Roman government for this privilege, was their own. It is easy to understand how this system put a premium on dishonesty and extortion. The men employed by these capitalists to do the actual gathering of taxes were called Publicans. All over the empire there was a bitter cry against greed and unscrupulousness of these agents. North of the Sea of Galilee was a great road leading from Damascus to the Mediterranean coast. At the point where the road passed from the territory of Philip the tetrarch to that of Herod Antipas, there was a customs house where goods were examined and duty collected. Matthew was probably at work here.

II. MATTHEW, THE CHOSEN DISCIPLE, MATT. 9:9B.

V. 9b. He saith unto him, Follow me. It was strange that Jesus should call a publican to be his disciple. James, John, Andrew and Simon should call one who, as a taxgatherer, belonged to a class that the people thought of as belonging to the same order as "heathen, assassins, robbers." He never dealt with men by their classification, but by their individual character. It was always the individual that he "saw" as he passed by. It was always the individual that he called. He arose, and followed. Luke says, "He forsook all, and rose up and followed him." His reason was like that of the Galilean fishermen,—without question, without reserve, without delay. It is not difficult to assume that there had been some previous preparation in the heart of Matthew. Matthew may have heard of Jesus. The message of Jesus was always for the outcast and the despised. As Matthew listened, he would hear the new note of sympathy in strange contrast to the note of scorn in the words of the scribe and Pharisee.

III. MATTHEW, THE BRAVE MISSIONARY, LUKE 10:13.

V. Jesus sat at meat. Luke puts it, "Levi made him a great feast." The home of Matthew is opened to Jesus as well as his heart. Many publicans and sinners came. Note how "publicans and sinners" are used as if they described persons of the same moral standing. Sat down with him and his disciples. All the old companions of

whitewashed tree there are two insect larvae in particular to which a whitewashed tree means nothing in their young lives. The baby flat-headed apple-tree borer and the similar appearing oak tree girdler are the two. The orchardist who has used the whitewash formula just noted has found that the addition of lead arsenate has reduced the invasion of the borers more than 90 per cent.

In applying whitewash it is recommended that the mixture be spread an inch or two below the surface of the soil. This may require the use of a hoe, but it will be well worth the effort in that those insects hatching at this location are guarded against.

Free Water Beneficial to Pigs in Winter Feeding.

An experiment is reported by the Dominion Animal Husbandman to determine if water kept before the pigs at all times in addition to the regular ration of meal and milk is instrumental in the production of increased gains. Two lots of five Yorkshires each were used. Both were fed a meal ration consisting of one part each shorts, middlings, corn and oats, and five per cent. tankage. Lot No. 1 had water before it continually. In addition both lots had buttermilk. The experiment covered sixty days. The pigs in Lot 1 made an average gain each of 99.4 lbs. during the period and the pigs in Lot No. 2 an average gain each of 79 lbs. The fact, says the Dominion Animal Husbandman, that snow was accessible to the pigs during part of the experiment detracts from the accuracy of this result, and further observation is to be undertaken. Apart from this, he remarks, the fact that the lot receiving the water made a materially better showing than the lot receiving no water would appear to indicate that the availability of slightly warmed water in cold winter weather, where it is freely accessible to the pigs, is decidedly beneficial. In this connection, it seems reasonable to add, continues the Husbandman, that the supplying of fresh cold water to hogs while on pasture in the summer is very desirable and has proved decidedly beneficial.



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