Soils and Crops

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Controlling Insect Enemies of Potatoes.

There are, roughly, four controllable factors governing the yield of potatoes, namely, fertilizer, cultivation, seed and spraying. Many growers obtain the best seed available and fertilize and cultivate in the best possible manner, and yet neglect the spraying, which is most important of all. Experiments demonstrate beyond a doubt that $12 spent in spraying is worth twice as much as a ton of 4-8-10 fertilizer in increasing the yield of potatoes.

According to experiments held last year at the Annapolis Royal, Nova Scotia, Station, around one hundred bushels per acre increase was obtained from the use of $40 worth of fertilizer, or the increased crop resulting from the use of fertilizer cost forty cents per bushel. The increase in crop due to spraying ran over two hundred bushels per acre and cost less than $14, or an increased crop due to spraying cost around seven cents per bushel on the acre plots.

The unsprayed field gave 221 bushels per acre and the sprayed 398. A difference due to spraying of 177 bushels, or the increased crop was obtained at a cost of less than nine cents per bushel. Although there are some in the modern farm ranks who decry the value of fertilizer in boosting potatoes along, we do not need to take that position exactly, but rather to appreciate the fact that the spray is more valuable than the fertilizer, the latter being, however, useful in its place.

We may believe in the use of plenty of high-grade fertilizer, but let us not fail to emphasize the value of spraying, which costs less than one-fifth as much per acre as fertilizer and gives twice as great returns or is ten times as valuable, considering the amount of money invested by the grower. The results mentioned were achieved in the Maritime, where late blight is prevalent, and the difference would not be so marked in sections where this disease is not found, though the proportions would still favor spraying.

Bordeaux mixture is, of course, the spray for the potato. During the past few years many growers have found it advisable to increase the strength of the mixture as the season advances. Starting with 4-4-40, the second spray should be 5-5-40 and the third and later sprays, 6-6-40. The spraying should start when the plants are six inches high in order to control the potato beetles and blight.

White arsenic and hydrate lime, equal parts, is the cheapest of all arsenicals. The value of such a mixture has been thoroughly demonstrated on several farms. The directions for making this new mixture must be followed closely, for there is danger in using poison straight or not in conjunction with Bordeaux, or in any manner but exactly as recommended. The great saving, however, that results from its use makes it worth while for all potato growers to learn how to use it. The cost is about one-fifth that of other poisons or, to put it another way, one can make a white arsenic Bordeaux and the total cost of the white arsenic, bluestone and lime, will be approximately that of Paris green or lead arsenate. In addition, one has a better sticker than Paris green, a more rapid killer than lead arsenate, and the fungicidal value of Bordeaux as well.

The method of procedure is as follows: To each ten gallons of water intended for bluestone stock solution, add two pounds of the mixture (equal parts of white arsenic and hydrated lime) poison, stir this in and then into this dissolve ten pounds of bluestone. This will make a green precipitate. Always stir before using. Use this green mixture as if it were a solution of bluestone, each gallon containing one pound in solution. Add the proper quantity of lime and test with litmus in making Bordeaux just as though no poison were in the bluestone solution. All growers who use enough solution, seventy to one hundred gallons per acre per application of white arsenic Bordeaux, control the potato beetles.

Apply at least eighty gallons of poisoned Bordeaux in the strength mentioned per acre, and apply the spray at intervals of from ten days to two weeks from the time the plants are six inches high until they die of old age or the frost kills them. If the weather is damp and rainy, spray oftener; if dry, make the intervals two weeks. If your sprayer will only apply sixty gallons per acre per application, use it at intervals of from seven to ten days apart. If you have a hand-sprayer that only applies forty gallons per acre, go over the field twice at each application.

When using poison, apply the poisoned Bordeaux when the bugs are just beginning to appear. It takes a lot less arsenic to kill a small bug than a half-grown one. Above all, use common sense and judgment in spraying. Don't think that applying forty gallons per acre once or twice through the season will grow a large crop of potatoes. Such spraying often eases a man's conscience and enables him to say that he has sprayed without breaking any of the commandments, but in order to control insects and blights successfully there must be a certain amount of copper and a certain amount of arsenic applied to each acre, and it must be renewed often enough so that a continuous protection is afforded to the plant.

Potato aphids hibernate for the most part on the rose plant, both wild and cultivated. Root out all of the wild rose bushes in the neighborhood of potato fields and spray cultivated roses in the spring, about the time the first potatoes are coming up, with black leaf 40 at the rate of a tablespoonful to a bucket of water.

The potato aphis is one of the insects, in the control of which steps must be taken before the outbreak occurs. In other words, controlling potato aphids is like insurance—you buy your protection not knowing whether you will need it or not.

To control aphids use one pint of black leaf 40 to each one hundred gallons of Bordeaux and apply at a high pressure and with an up-spray. The spray must hit the insect in order to kill. Apply black leaf 40 with the first two or three applications of Bordeaux. It is particularly advisable for growers of seed potatoes to spray thoroughly for potato aphids. In no other way can they hope to keep down mosaic in years of aphids outbreaks.

Few realize the immense amount of damage that is caused by the small, black flea beetles that are found hopping about the potato for the first few weeks after it comes through the ground, in districts where this pest is prevalent. This insect tends to stunt the potato's early growth, and when prevalent, will reduce the acreage yield by one hundred bushels. In one case, where the beetles were controlled beside a plot on which they were allowed to run wild, the increased yield was nearly one hundred and forty bushels, from flea beetle control alone.

The best treatment is to apply a repellant, and for this Bordeaux is the best yet known. No poison is required in flea beetle control as they absolutely refuse to eat a plant that is coated with straight Bordeaux.

If flea beetles are plentiful on potatoes when they first appear, apply a good coat of 4-4-40 Bordeaux. Continue this every week up until the middle of July. It pays as well to protect the young plant from injury as it does the halfgrown plant.

Poultry

We have set about 630 eggs but only 300 hatched. The eggs are fertile, but the shell cracks off and leaves the skin on that should come off with it, and the skin dries and seems so tough that the chick can not break through. Could you tell us what the trouble is?—D. C.

When the membrane beneath the shell dries down so the chick cannot emerge it usually means that the moisture conditions have not been right. If you are hatching with hens try placing a moist sod in the bottom of each nest box. It will usually furnish enough moisture to enable the chicks to hatch. When hatching with incubators we soak woollen cloths in very hot water and apply them to the eggs on the eighteenth night. They are removed several hours later. Then the cloths will be found dry and the moisture will seem to have entered the shells and the egg chamber. Then close the incubator and do not open again until the hatching is entirely over.

Sometimes chicks die in the shell due to a weakness of the germ. A few might die in the shell even if the remainder of the eggs produced a satisfactory number of chicks. Overheating in the incubator might cause the trouble. The air might be too dry in the room where the machine is operated.

The Dairy

Butterfat production helps to pay grocery bills but it is poor policy to rob the young calf in order to pay these bills.

The butterfat production of the future depends upon the growth and development of the present day dairy calf.

The calf ought to have warm, sweet whole milk until two or three weeks old; from four to six quarts per day, depending upon her size. From then on skim-milk may be be added in gradually increasing quantities until, at the age of five weeks, the calf is drinking skim-milk entirely at the rate of seven to nine quarts daily. Warm sweet milk is far superior to any other. It is a mistake to attempt to make up in quantity what skim-milk lacks in butterfat.

Whole oats or shelled corn are eaten readily when the calf is quite young. A liberal supply of these grains should be used to supplement the skim-milk ration which should be continued until the calf is five or six months old. Only a well-fed calf builds a healthy, heavy-milk-yield cow.

When he was a farmer he spake as a farmer, he understood as a farmer, he thought as a farmer; but after he was elected he put away his farmerish things.

Beginning Bee-Keeping.

The best time of the year to begin bee-keeping is in the spring. If possible the beginner before starting should pay a visit to other bee-keepers and study the methods to pursue. In his bulletin on "Bees and How to Keep Them," the late F. W. Sladen, Dominion Apiarist, advises starting on a small scale, as nothing is so disheartening to the too venturesome as to lose his bees owing to a lack of experience. A couple of colonies are sufficient at first. With the gaining of knowledge and understanding, additions can be made. The first outlay need not exceed $25 or $30 if judgment is used. It is well to make the bees pay their way after the first outlay. Colonies, complete in their hives, may be obtained in May, or swarms may be obtained in June or early in July. The former should each give a fair amount of surplus honey or a swarm or two the same season, but a swarm is not likely to produce much honey the first year, unless it is a very early one. The colony or swarm should be fairly populous, and should have a young fertile queen. Be sure that the apiary from which it cames is free from disease. If possible procure the bees in the neighborhood, as death is frequent from unskilful packing if the bees are brought from a long distance. Another reason for nearby buying is the less risk of disease from contact. The seller will usually assist in the moving of the bees. If the colony is procured in April or May there will be less risk of loss than if transported later.

A method of buying bees that has come into favor is by weight, without combs, in boxes specially constructed for the purpose. Packed with care the bees will survive a journey of some length, lasting several days in fact, and will not be likely to carry brood disease after so long a separation from their combs if the food supplied is free from infection and they are compelled to build new combs. Colonies should be moved in autumn or early spring if the distance is less than two miles in order to avoid the return of many of the bees to the old location. Always bear in mind that the successful bee-keeper is the one who has learnt how the bees will act under various conditions and how these conditions and the actions of the bees can be controlled.

Poultry Performance Record.

That the Record of Performance in egg-laying, established by the Poultry Division of the Dominion Live Stock Branch, is appreciated is indicated by the increase both of breeders and entries for 1920-21 compared with the number entered in 1919-20. In the latter year the entries were 67 breeders and 4,436 birds and in the former 81 breeders and 7,511 birds. Quebec shows, according to the second report just issued, the largest increase in the number of breeders, and Ontario and British Columbia show the greatest increase in birds entered. The report indicates that the breeds most favored by British Columbia are Leghorns and Wyandottes, and by Ontario Leghorns, Plymouth Rocks and Wyandottes. Quebec's fancy is for Plymouth Rocks and Rhode Island Reds. New Brunswick, Prince Edward Island and Saskatchewan also favor Plymouth Rocks. British Columbia stands well ahead in the number of birds qualified for the record, Ontario coming second, Quebec third, and Saskatchewan fourth. Considerable improvement in this respect is shown in the second year compared with the first.

Certificates are issued for all qualified birds laying no fewer than 150 eggs in 52 consecutive weeks, with advanced certificates for birds that lay over 225 eggs in the same period, providing the quality of the eggs is not lower than the grade specials in the Canadian standard for eggs and that they average at least two ounces in weight. British Columbia again shows to advantage in the advance qualifications, with Ontario and Quebec following, with new Brunswick fourth, and Saskatchewan and Prince Edward Island tying. In British Columbit, 96 Single Comb White Leghorns granted advanced certificates, averaged 238.32 eggs per bird in the 52 weeks; 42 Wyandottes, 242.17 per bird, and 25 Barred Plymouth Rocks, 241.17 per bird. In Ontario 44 advanced Leghorns laid an average of 245 eggs per bird in the 52 weeks, 27 Plymouth Rocks 234.16 per bird, and 18 Wyandottes 233.13 per bird. In Quebec 10 advanced Plymouth Rocks averaged 235.2 eggs per bird, and 6 Rhode Island Reds 235.3 per bird.

Grading of Hogs.

The maintenance of Canada's export bacon trade will depend to a great extent on an adequate supply of hogs of the right type for conversion into first quality bacon. As an inducement to farmers to breed and feed that type a premium will be paid for hogs that grade a "select." The grading of hogs is expected to commence at an early date in accordance with the standards recommended at the recent conference of producers, packers and Dominion and Provincial departmental officials, held in Ottawa under the auspices of the Dominion Department of Agriculture. Official graders will be stationed at stockyards, abattoirs, and other points where necessary, and a minimum premium of 10 per cent. will be paid by the packers for hogs suitable for the production of select bacon. The difference in price between the grades of live hogs, other than "Select Bacon" and "Thick Smooth" hogs, will be determined by supply and demand. The "Select Bacon" and "Thick Smooth" standards adopted were as follows:

Select bacon hogs—Jowl and shoulder light and smooth; back from neck to tail evenly fleshed; side long, medium depth, dropping straight from back, ham full, good general finish, no excess fat; weight 160 to 210 lbs.

Thick smooth hogs—Not conforming to Wiltshire standard, but of smooth fleshing and finish; weight 160 to 210 lbs.

The grading will be carried on under the direction of the Live Stock Branch of the Department by competent officers appointed for the purpose.

A Durable Exterior Whitewash.

To make a durable whitewash for outside surfaces combine fifty pounds of hydrated lime, or thirty-eight pounds of quicklime, with three pounds of sodium phosphate, or the same amount of soda ash may be used, and five pounds of casein with nine and a half gallons of water. This whitewash is easiest prepared by dissolving the casein in the sodium phosphate solution and then adding this to the milk of lime after the latter has become cold.

Jim Crow---And How to Treat Him

A Simple Way to Get Rid of a Big Nuisance

Like most outlaws, the notorious Jim Crow has some points that are commended among law-abiding citizens, but when he is a bad bird he is a hard-boiled egg. His springtime ravages on the cornfield are very largely responsible for his unsavory reputation, but he has added to it by occasional raids on the poultry yard, depredations on wild birds, and attacks on crops other than corn. At certain seasons and in certain localities he becomes such a nuisance and a detriment to farming that he must be warned by making an example of some members of his gang.

Jim is only about half bad, and because of his better half, which does not mean his wife, who is just as black as he is, it is not advisable to treat him too harshly. Nearly one-fifth of his food is made up of insects, and he includes on his menu some of the farmer's worst enemies—grasshoppers, caterpillars, and white grubs and their parents, the May beetles.

Probably we could not get along so well without Jim Crow as with him. Killing off the whole family, if that were possible, would be a shortsighted policy. So while we recommend the poisoning of crows, this measure should be looked upon merely as a warning to Jim and his family that they have been going too far and that they can't get away with everything. They are wary enough not to need many repetitions of the lesson, at least not in one season.

Every spring farmers revive their old feud with the Jim Crow family, carrying on a desultory battle by means of scarecrows, epithets, and the more effective deterrents of coal tar and poison. Coal tar, which may be secured at gas plants and some paint shops is not a poison, but it imparts a disagreable gassy odor to the seed grain that is distasteful to crows and other pests. It has the advantage, not possessed by some other deterrents on the market, of not affecting the germination of the corn when used in limited quantities. A tablespoonful is used to a half bushel of seed. The grain is first heated by an application of warm water, and then drained. The coal tar is added immediately and a thorough stirring will give each kernel an even coating. The seed is then spread out to dry or is dried by the addition of sifted ashes, land plaster, or powdered earth.

The best deterrent, however, is strychine, which may be applied to corn in a paste made up in the proportion of one ounce of powdered strychnine, two tablespoons of starch, and one and one-half pints of water to twenty quarts of corn. The starch and strychnine are put into the water, which is heated to boiling, and stirred well when the starch begins to thicken. This paste is poured on the corn and stirred into it until thoroughly distributed. The corn is spread to dry and is then ready to use.

This method is better than the old one of steeping the corn in a strong strychnine solution. Because of their wariness it will not be possible to kill many of the crows, but a little of this poisoned corn scattered over the field of sprouting corn will get a few of them and the rest will take the warning and leave. Using whole corn for bait lessens the danger of poisoning smaller seed-eating birds. Care should be taken not to distribute the poisoned grain near the farm buildings where domestic animals might pick it up. The crows usually do their corn pulling at some distance from the buildings.

Before going ahead with poisoning operations which involve the spreading of poison it is always advisable to look up laws and local regulations regarding the distribution of poison. Local conditions may modify practices a great deal, especially in thickly populated regions.

SMOKE
OLD CHUM
The Tobacco of Quality
½ LB. TINS
and in packages

THE SUNDAY SCHOOL

MAY 21

Hilkiah's Great Discovery, 2 Chron. 34: 14-16, 29-32. Golden Text—Thy word is a lamp unto my feet, and light unto my path, Ps. 119: 105. (Rev. Ver.).

Time and Place—B.C. 623; Jerusalem.

Lesson Foreword—Josiah, like Hezekiah, was a reforming ruler. Under him the religion of Israel was once again cleansed of many of its heathen elements. His reforms were due to the impr. sion made upon him by the discovery of the book of the law in the temple. 2 Kings 22: 3 to 23: 25 should be carefully read in connection with this lesson.

I. The Book of The Law Discovered, 14-16.

V. 14. Josiah had undertaken the repair of the temple, which had fallen into decay, and had sent Shaphan, his secretary, to help Hilkiah, the priest, to count the repair money collected in the temple, 2 Kings 22: 3-7. **And when they brought out the money.** As was pointed out in the Lesson Foreword, Jehoash had instituted a new system for keeping the temple in repair. A box with a hole bored in it was placed near the altar and into this the worshippers dropped their offerings for the temple upkeep. Previously the priests had shown a great laxity in the handling of the temple funds. So it was arranged that the king's secretary should act with the priest in counting the money and paying the workmen. Shaphan was acting in that capacity when Hilkiah told him of his great find. **Hilkiah the priest found a book,** etc. "How the book came to be in this particular place we are not told. We may conjecture that the priest had been inspecting the repairs or making ready for them; that he had been taking an inventory of the store chambers; that he had been cleansing the Holy Place—plenty of occasions exist" (H. P. Smith). **A book of the law.** Most scholars are now agreed that this was the Book of Deuteronomy and not the whole of the Law (the Pentateuch or Five Books of Moses). At least three reasons are usually given for considering this law book to be Deuteronomy: (1) It was read through twice on the day it was discovered. (2) The great impression it made on Josiah could be explained by the woes pronounced by Deuteronomy if the law were not observed (see 2 Kings 22: 13 and Deut., ch. 28). (3) The consequent reforms of Josiah are those advocated in Deuteronomy.

V. 15. **Hilkiah delivered the book to Shaphan.** This was natural. The high priest could not by himself have carried out the prescriptions of the new law book without the consent and support of the king. If the book were given to Shaplan it would be sure to reach the king and his support would be gained.

V. 16. **Shaphan carried the book to the king.** Shaphan immediately repaired to the royal palace which stood close by the temple. He first told the king of the progress of the repair work on the temple and then he divulged the great discovery.

When the book of law was read to Josiah it created a profound impression on him. He heard the recital of woes for the non-observance of the law and yet he recognized that it had not been kept. He decided to investigate whether the book discovered were genuine or not. A deputation was sent to Huldah, the prophetess. The prophets were now recognized as the mouthpiece of God, and Huldah could answer the perplexing question. Huldah's reply was that the book of the law genuinely expressed the will of God.

II. The Book of The Law Read, 29-30.

V. 29. Josiah convened a national assembly for the purpose of accepting the newly found law as the law of the nation. **Elders of Judah and Jerusalem.** The elders were the heads of families or leading men of each town or village. They administered justice and acted as representatives of their community.

V. 30. The national assembly was held in the precincts of the temple. To it there came not only the elders but a great concourse of people from all parts of the country. **The Levites.** Originally they were the priests at the various sanctuaries throughout the land. When later these sanctuaries were destroyed and the only legitimate place of worship was the temple in Jerusalem, the Levites were taken into the Jerusalem temple. **He read in their ears,** etc. The fact that Josiah was able to read through the whole book at one gathering strengthens the argument that the book was Deuteronomy and not the whole Pentateuch.

III. The Covenant Renewed, 31, 32.

V. 31. **The King stood in his place.** The king had a special place when he worshipped in the temple and 2 Kings 23: 3 mentions that it was "by a pillar." It has been suggested that for this occasion he may have had a raised platform. **Made a covenant.** A covenant was ratified by a ceremonial observance. A sacrificial victim was hewn in pieces and the two parties to the covenant passed between.

V. 32. First the king made a solemn vow to observe the law contained in the new book. Then the people were required to stand and take the oath after him, probably by responding, "Amen."

Application.

One of the results of the Reformation was a new appreciation of the Bible. Even before this man had seized with eagerness the portions of Scripture that Wycliffe had translated. Foxe writes: "After Wycliffe's time some gave a load of hay for a few chapters of St. James or St. Paul." Some time after this Erasmus wrote: "I wish that the scriptures were translated into all languages of the people. I wish that the husbandman might sing parts of them at his plough and the weaver at his shuttle, and that the traveller might beguile with their narration the weariness of his way."

There is a well-known picture of a traveler, on a wild, stormy night, standing up in the stirrups of his saddle at a parting of the ways, trying to read the directions on the signpost. How eagerly he looks and how carefully he holds the lighted match as he strives to read the directions. The Bible is our book of directions, and we are safe when we follow its guidance.

Thinks It Better to Keep Up Grain.

Dairymen differ in opinion as to the practicability of continuing the grain ration after the cows are turned out to pasture. It has been our experience that it pays to keep the grain up, and especially with heavy-milking cows. There are cows in every herd that are beginning to decline in milk flow as they are turned out to pasture These cows I do not consider profitable to grain, but as a rule cows do much better and hold up longer on their milk flow if given a liberal grain ration even on good pasture. Early spring pasture is highly succulent and for a short time will produce an increased milk flow, but as the season wanes the supply gradually becomes insufficient to insure maximum milk production. Heavy milch cows, to produce a profitable flow of milk during the pasture months, should receive some concentrated feed to balance up the pasture. —L. R.

Fine barns do not make good cows.

Whim is no guide to food needs, especially for children. Youngsters can be taught to like the foods good for them.