Soils and Crops

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The White Grub in Eastern Canada—Methods of Control.

The Dominion Entomologist reports that from information gathered, particularly by Mr. H. F. Hudson of the Entomological Laboratory, Strathroy, Ont., it is expected that injury by the white grub will be effected this year in Eastern Canada. This important insect has been receiving much attention during recent years. The complete life cycle of the insect requires from three to four years. In association with studies on the life-history of the common kinds of white grubs, close observations have been made on the crop rotations followed on farms where the grubs have been decidedly injurious, and also on farms where little or no injury has occurred. As the insect spends the greater part of its life in the soil, where it is not possible to treat the pest, it has been found that almost complete control can be obtained by following a short crop rotation in which grass or clover or a mixture of the same shall not occupy the land for more than two years, and preferably not more than one. In infested fields where grubs are present measuring from one-half to one inch in length the following crop rotation has been found to give almost complete control:—

First year: plant the infested field to oats and seed to clover.

Second year: clover hay crop. Plow under the clover sod in the spring of the third year, and plant the land to corn or potatoes.

Fourth year: plant the land to oats and re-seed to clover.

From the above rotation it is seen that the hay crop only occupies the land one year, and that with every four years two crops of clover are grown. This plan, besides giving practical control, will maintain the land in a high state of fertility. Similar procedure should be followed in breaking up an old pasture, except that the sod should be fall plowed and worked as frequently as possible.

If pigs are allowed a free run of badly infested pasture land, they will root out many of the grubs and materially help to control the pest. Domestic poultry feed readily on white grubs, and should be encouraged to follow the plow as much as possible. Black birds, crows and other birds, as well as skunks, also feed on the grubs.

Best Feeding Rations for Young Chicks.

As a preliminary step in the study of the nutrition of poultry the Central Experimental Farm at Ottawa made a test with twelve pens of forty-two young chicks last year. These birds were fed for a five-week period, during which time the weekly gain in weight was carefully noted. The annual report of the Farms for that year states that the basal ration in this experiment consisted of finely ground corn, wheat and oats and finely ground bran, shorts and cornmeal. Pen No. 1 received the basal ration only, the rations in the other pens being supplemented by one or more feeds, e.g., greens, eggs, meat, and milk. Pen No. 1, the poorest, lost 31 birds and the survivors made an average gain of only 1.67 ounces. Pen No. 9, fed meat, eggs and greens in addition to the basal ration, suffered the lowest mortality, namely, 4 birds, or 10 per cent., and gained 5.26 ounces per bird; while in Pen No. 11, which had a ration similar to No. 9 but had milk to drink, the mortality was 7 birds, but the gain of 5.87 per cent. was the highest pen average. The relative value of these four feeds can be well shown by a comparison of the results when they were fed singly in addition to the basal ration. Pens 2, 3, 4, and 5 received meat, eggs, milk, and greens respectively, and the mortalities were 26, 18, 28 and 24, while the average gain per bird was 3.32, 3.44, 2.79, and 2.81 ounces. These figures clearly demonstrate the value of eggs as one of the first ingredients of food for young chicks.

Topics in Season.

To exterminate thistles, simply mow them when in bloom.

A barrel which has had kraut in it can be cleaned with salt. Rub dry salt on the inside of the barrel, leave it a while and then wash it off. Or you can fill the barrel with salt brine and leave it in a day or two.

To treat binder twine so that grasshoppers and crickets will not cut it, dip the twine in a mixture of three parts of kerosene and one part of machine oil. Kerosene alone will do, but twine thus treated will be likely to catch and break when running through the binder.

There is no best silo, for any silo rightly made is good. But the most expensive silo, poorly constructed, is worse than none.

I made a toy windmill, placed it on a pole, set it in the garden with the pole about a foot deep. The vibrations and noise keep the moles out.

Never set young plants immediately after a heavy rain. The sun will scald and wilt them. Wait a few hours.

For every dollar's worth of honey which bees bring to their owners, it is safe to say that they bring $15 in increased apple crops to the owners of orchards.

When tips of shoots on pear trees turn black and leaves wither, blight is the cause. The disease is carried down the branches to the tree by the sap. Hence, the way to check trouble is to cut out the tips as soon as possible. To prevent spreading the disease, disinfect the tools after each cut with corrosive sublimate. This should be kept in a bottle out of the reach of children, and should be labeled "poison" in large letters. In cutting out, cut a little distance below the diseased part, and burn all portions removed.

Ashes or road-dust will kill pear-slugs. The minute dry dust gets on them, they will start to dry up.

The largest grapes in the world are grown under glass in England. Grapes of the Giant Gros variety often measure between four and five inches around, and clusters weigh twenty or thirty pounds each.

I had a neighbor who put a little salt in every hole where she set a cabbage plant, to keep away the cutworms. I reasoned, "Why not salt the whole garden?" The next spring, before breaking up the garden soil, I sowed salt about as thick as I would broadcast turnip seed. I have practiced this for fifteen years, and have not been troubled with cutworms since.

Scattering boric acid on the greenhouse walks the last thing at night kills many cockroaches that are out to destroy plants growing in the house.

Fighting the cutworm: The growers around here always use paper bands to protect newly set plants from cutworms. It would be quite a lot of work and useless expense to hold these bands together with cotton string. Here is a way to hold these bands together. Take tough paper, long enough to make the band, and about six or eight inches wide. Fold this together lengthwise in the middle, shove one end of this into the fold of the other end about an inch, and there you are. In using, make a little trench around the plant with the finger, so to get the band about an inch in the ground. Draw a little loose ground around the outside to hold the band in place.

The Dairy

Dairymen buy milking machines for one of three reasons, or for all three reasons. First, because they realize a milker will save them labor if they do the milking themselves, or labor hire if they have many hands. Second, the milking machine saves time. Third, a first-class milking machine milks the same way every day, and the treatment which the cows receive is not dependent upon the whim or humor of a hired man. The three motives, in short, are time saved, labor saved, and the good effect on cows, or increased milk production.

In my particular case, all three of these items were duly considered, and I made up my mind that it would be economy for me to buy a milking machine that would accomplish for me those three things. At that time I was milking only ten cows, but with the intention of increasing my herd, which I have since done.

I bought one of the best milkers and do not hesitate in saying it is everything the manufacturers said it would be. I have been using it twice a day now for the past nine months, and it has always given me complete satisfaction. The cows really seem to like it, and while I have not kept records, and have added new cows to my herd from time to time, I am firmly convinced that the cows I had before installing the milker are now giving more milk than they did when I milked them by hand.

It used to take an hour and a half to milk ten cows, whereas I now milk fourteen in about one hour. I have not had a case of teat or udder trouble since putting in the milker. The milker is easy to clean and keep sanitary. Its upkeep has been nothing, with the exception of a few rubber teat-cup liners, which expense is not worth mentioning. I follow the operating instructions to the letter and find that it pays.

Nine months' experience with mechanical milking has made me such a saving that I believe I am safe in saying that a good milking machine will actually pay for itself in a year. And if I had to go back to the old method of hand milking, I feel pretty sure that dairying would soon lose its attractiveness to me.

To forget wrong is the best revenge.

Look out for squalls when the clothesline breaks.

The calendar should contain a month of Will as well as a month of May.

There was once a man who had to drive down a stake to tell where he left off weeding the onion row. However, after he got a farm of his own, that sort of thing came to an end.

Here's Father's Chance to Do Mother a Mighty Good Turn

By F. W. Ives

It was raining. The mud was deep and the roads badly cut up. So, when the top of the ridge was reached, the radiator of my car had boiled dry. A dim light through the misty dusk showed a farmhouse. I walked up to the door, where my knock was answered by a bent old woman who gave me two pails and said: "You will find the path to the spring around in back."

Now, that path wound down into a ravine about 80 feet below the house. The spring was fully 100 yards from the back door. When the top was reached, I was in about the same condition as the car—wet, muddy and hot. I was also filled with wonder as to why it was necessary to carry so much water up hill when so much was falling on the roofs of the buildings.

The old woman said she had lived there fifty years, that she had made at least three trips to the spring each day, that she always took two buckets, and that on washdays more trips were made.

The spring offered opportunity for a hydraulic ram and a plentiful supply of water. Likewise, there was the barn with a driveway on a knoll a little higher than the ceiling of the house. What a fine place for a cistern! Plenty of water from the roof to more than supply all the needs with no pumping.

When I reached home that evening, some calculations showed the following facts: In carrying the water from the spring, this woman had walked a distance equal to that from Montreal to Vancouver and return, or one-fourth the distance around the world. In doing this, she had ascended and descended a mountain 150 times as high as the highest in the world. She had carried 1,100 tons of water all this distance.

All this vast amount of work was useless. A small expenditure of money would have put water in the house with no work on the part of the housewife. With average rainfall, 93 tons of water could have been stored in a cistern from the roof of the barn in the course of a year, or four times as much as the woman had carried up the hill. The spring was large enough for a water ram to force over 400 tons of water to the kitchen in one year. At the time this incident occurred, a ram, complete with fittings, and a kitchen sink, might have been installed at a cost of $61 for materials. A cistern might have been constructed in the approach to the barn, and connected with a sink, for a total cost, including labor, of less than $200.

Of course, $200 is quite an expense. But does a farmer hesitate to purchase a binder costing $200? The average farm uses a binder about six working days each year. The average binder lasts about six or seven seasons with our careless ways. This cistern, if built right, would last fifty years. The water will be used 365 days every year.

You say, "The binder is necessary in order to save labor."

Very well, I say, "Why should not the housewife save labor as well?"

When a young man is courting, he seldom asks "her" if she is willing to carry 1,100 tons of water up a mountain 650 miles high for him.

There are many ways of getting water into the kitchen that do not cost $200. Some cost more.

A Sink is Necessary.

In all the methods given in the following discussion, a kitchen sink is included. A kitchen sink must have a drain to take away waste where it will not contaminate the surroundings or water supply. The sink with a drain just long enough to stick through the side of the house is not a sink. Nor is the zinc-lined box with a hole in the bottom that drains into an ancient candy pail a sink. It is just as bad to have to carry water out as to have to carry it in. All of the methods given have been in use on various farms long enough to tell their good and bad points. Most of them may be seen in any community.

The cheapest and simplest method of securing a kitchen water supply is that of placing a rain-water barrel on brackets under the eaves at a height that will allow the water to flow from a tap into the sink. The total cost of such an installation need not exceed $5. A kerosene barrel, a short length of one-half-inch pipe fitted to the barrel with lock nuts and gaskets, an ordinary bibb or faucet, and a few pieces of scantling may constitute the materials.

To double the capacity, use two barrels, connecting them with a piece of pipe at the bottom. A screen over the top will exclude dirt and leaves, and prevent the breeding of mosquitoes. The objection to this scheme is that it works only when the rains come at fairly regular intervals. It is also useless in winter. But it is good while it works, and is far better than carrying all the water.

The pitcher pump at one end of the sink has the virtue of getting water into the house without carrying, although it does take a little effort to work the handle.

The pitcher pump is of the suction type, hence water may be drawn vertically, only about 22 feet or less. Neither will it work satisfactorily if the cistern or well is located more than 50 feet horizontally from the pump. The above limitations are due to the force of gravity and the friction of the water passing through the pipe. The cost of installing a pitcher pump complete should not exceed $15 in addition to the cost of the sink.

The Gravity Tank.

Another successful scheme is to mount a tank just above the sink. This tank, with a capacity of from 30 to 50 gallons, is pumped full by the men in the morning, and will hold enough for ordinary household purposes for one day. A force pump is usually necessary for this sort of work. On one farm the pumping is done by a windmill each morning as the stock tank is being filled, there being a three-way valve installed at the pump. When turned in one direction, the water fills the house tank, and when turned in another direction the water goes to the stock tank. This is merely a modification of the gravity tank as sometimes placed in the attic. Its good feature is that of being inexpensive. It has the disadvantage of taking up valuable space in a small kitchen; also, if the water is used for drinking, it will get quite warm before the day is over. An insulating jacket will help to keep the water cool.

The gravity tank has many applications. It may be located on a tower, in the attic or upper storey of the house or an outbuilding, on a hill, in the bank approach to the barn, or on any other convenient elevation within a reasonable distance of both the supply and the house. The gravity tank may be filled in numerous ways, depending on local conditions. I have seen these tanks filled by force pump, by hydraulic ram, from a spring located on a hill above the tank, from the roof of the barn or house, and from a flowing well. The possibility of a gravity system should be carefully considered before installing an expensive mechanical water-supply outfit.

Where it is possible, the gravity system may not be the cheapest in first cost, but if the water is obtained by gravity or by hydraulic ram the cost of operation is very small.

Nor must the windmill be overlooked. Because the wind does not blow every day, many have abandoned the wind power in favor of gasoline or kerosene. With the prices of these fuels constantly rising higher, the cheap wind power must be seriously considered. The secret of a satisfactory water supply from wind-driven pumps lies in the gravity tank of a capacity large enough to tide over the calm days. Improved windmills, with ball or roller bearings, large oil reservoirs, and scientifically designed vanes and blades take advantage of the lightest breezes.

Gravity tanks of all kinds are susceptible to trouble. Freezing in winter is likely to burst the tank, especially one of small dimensions and square shape. In the case of the large tanks or cisterns for storing water over long periods, carelessness in closing faucest may result in the loss of the entire supply. This may be remedied by the use of good self-closing cocks. Freezing may be taken care of by careful packing of pipes and other exposed surfaces. A tower tank, as usually erected, is not very ornamental, and a tank in a building or built into a bank is likely to be more satisfactory. The attic tank should always be set in a metal pan provided with a drain. Leaks, condensation, or breaks from freezing will then be taken care of automatically. All tanks should be provided with an overflow a size larger than the inlet pipe.

The amount of water that may be collected from a roof will depend upon the annual rainfall, the size of the roof, and the ability of the spouting and gutters to handle the maximum fall.

Calculating Cistern's Capacity.

The mean annual rainfall in Ontario, for example, is very close to 35 inches. Of this, it is reasonable to expect that 25 inches may be conducted into a cistern. The loss of 10 inches comes through small showers that barely wet the roof, from moisture absorbed by the roofing material, from evaporation, snow blown from the roof, and overflow of gutters in heavy showers.

To find the amount of water that may be collected from a given roof in Ontario, we would first measure the ground area of the structure. This area multiplied by the total rainfall will give the volume of water. Thus, a building 30x40 feet has an area of 1,200 square feet. Multiply this by the equivalent of 25 inches, or 2 feet, and we find a volume of 2,400 cubic feet, or 20,000 gallons. Now, if we are using water constantly, it will not be necessary to make the cistern to hold the full amount. An 8,000-gallon cistern will hold the water from one wet season to another in Ontario.

The easier water is obtained the more it will be used, and that is exactly what we wish to lead to. In the average family where the water is carried, the daily consumption may be as low as two gallons for each person. With an unlimited supply, this quantity will be as high as 60 to 80 gallons. This water will be used for more frequent bathing, for better laundry work, cookery, drinking, and toilet purposes. It will be safe to compute the size of cistern or daily water supply, as the case may be, on a basis of 40 gallons each day for each grown person or two children in the family.

Where the roofs are not large enough to supply the needs of the family, the following scheme has been used: A basin about 40 feet square was made in the top of a rise above the level of the tank. The basin was paved with concrete reinforced with fencing, and sloped to a central drain provided with a trap to prevent entrance of trash. The water was conducted through a filter to the tank located farther down the slope, and from there was piped to the house. This supply nets about 30,000 gallons each year. The land upon which it was built was practically valueless for any other purpose.

The hydraulic ram is a possibility where a spring has a flow of three gallons or more per minute. A watch with a second hand, a vessel of known capacity, and a small dam to flow the water into the vessel are all that are needed to determine the flow. There must also be an opportunity to get a fall of three feet or more below the spring for the operation of the ram. Roughly speaking, the ram will elevate the water about ten times as high as the available working head or fall, and will pump about one-seventh of the water furnished it. The hydraulic ram is not a perpetual-motion machine, but it is a faithful servant. I have known a ram that operated for ten years without stopping, except when the spring failed in an extremely dry season.

Of the mechanically driven water supply systems there are many. A great degree of perfection has been reached by a considerable number of these systems.

THE SUNDAY SCHOOL

MAY 22.

The Christian View of the Family. St. Luke 10: 38-42; 2: 51; 2 Tim. 3: 14, 15. Golden Text—Col. 3: 20, 21.

Connecting Links—There is a fine description of the good man's home in Psalm 128. It is the home of a man who fears God and walks in His ways, who earns the food of his family by labor, and whose children gather, happy and healthy, about his table, like the branches round about the olive tree. The ideal woman of Old Testament times is described in Prov. 31: 10-31. She is a good wife, a good mother, and a good mistress. She works herself, and wisely guides the work of others. She makes all the work of her household a task of honor, and "in her tongue is the law of kindness." She is the true home maker.

St. Luke 10: 38-42. **A certain village.** This, as we know, was Bethany, near Jerusalem, the home of those warm-hearted and loyal friends of Jesus, Lazarus, Martha, and Mary. Martha was, apparently, the elder sister, and directed the affairs of the household. She received Jesus with ready hospitality, and busied herself to provide entertainment for Him and such of His disciples as were with Him. Our sympathy goes out to the busy housewife who was cumbered about much serving, while her sister sat idly at Jesus' feet. We are sorry, however, that she lost her temper, and spoke so crossly to her guest.

But a little reflection will convince us that Jesus read the character of the two sisters rightly. Martha was careful and troubled about many things, so much so that she had not time to think or to learn. Jesus was teaching, speaking unforgettable words, but Martha had not time to listen. There was so much to be done for the household and her guests. The household cares were to her of first importance. Mary was not usually neglectful or unmindful of her share of the labor, but just now she was so wrapped up in what Jesus was saying that she forgot everything else. She put her Master's words first. Other things could wait. And the Lord said to her, "She hath chosen that good part which shall not be taken away from her."

Is there anything like this home of Bethany in the home life of the present day? Are we too busy to think, to read, and to pray? Is business the all-important matter to us? Are we choosing in our homes the better part, as Mary chose, or are we simply busy, bustling, hard-working materialists like Martha?

2 51-52. **He went down with them.** Jesus lived with His parents in their Nazareth home. He was subject to them. That is to say, He was a loyal and obedient son, taking His part and share in all the life of the home, working and learning His trade at the carpenter's bench, helping, after the death of Joseph, in the bringing up of His younger brothers and sisters. And with Him constantly was the mother's watchful and loving care, while she treasured in her heart the things which had been said about Him in His infancy, and His own early, wise, and thoughtful words.

The boy is described as growing up in the home in a fourfold development of healthy and strong and clean young manhood—in intellectual, physical, spiritual, and social character. The verse (2: 52) has been rightly taken as setting forth normal and healthy growth. It suggests the need in every community and in every home of a fourfold training, a four-sided education, which will take account of all the needs of a boy or girl. It suggests that social and physical training should be set side by side with intellectual and spiritual, and so shows us where, in much of our church and home life we are failing to do the best for our young folk. The example of the education of the boy Jesus is a good one to follow.

2 Timothy 3: 14-15. **But continue thou.** Timothy had had a good start in life. His father was a Greek, and of him we know nothing, but his mother was a Jewess, and she instructed him well in the scriptures of the Old Testament, which were her Bible. Paul knew his mother, whose name was Eunice, and speaks (1: 5) of her faith and of that of his grandmother Lois. Living in Asia Minor, in the heathen city of Lystra (Acts 16: 1-2), they had kept their home pure, and their hearts fixed in the religion of their fathers. And so, when Paul preached the gospel there they were among the first to believe.

When Paul wrote this letter from his prison in Rome he had known Timothy for a good many years. He still regards him as his own son in the gospel, and admonishes him with fatherly solicitude. In particular he counsels him to continue in the reading and study of those holy books which he had learned from his childhood. For they are indeed able to make wise unto salvation through faith which is in Christ Jesus.

Our lessons set forth three things which should characterize the Christian home (1) thoughtful choice of and attention to the best things, (2) an all-round education for the children, and (3) a reverent regard for and a continued study of the Bible as the text-book of our faith.

Application.

Sometimes a Christian household in the midst of a community is as potent as a Christian Church. Not long ago we heard a builder say that one undesirable family in a neighborhood could lessen the value of property all around. On the other hand there are households which give dignity and respectability to the whole neighborhood. In an Ontario village where we were visiting not long ago, one house was pointed out to us by a resident, who said, "The family living in that house has done more for this village than we shall ever be able to estimate. Father, mother, and all of the five children are Christians, and in every good cause they can be counted on."

Teaching a Calf to Drink.

A calf that is weaned from its mother should be kept without food for at least twelve hours, at the end of which time it will be hungry and will usually drink milk from a pail much more readily than when not hungry. Warm, fresh milk from the mother should be put into a clean pail and held near the floor, in front of the calf, which will generally start to nose about the pail.

Place one or two fingers in the calf's mouth, and draw the hand down into the milk, as the calf begins to suck the fingers. The calf in this way gets a taste of the milk and often starts to drink without further trouble. If not, the process must be repeated.

But sometimes the calf refuses, and force must be resorted to. The feeder, facing the same direction as the calf, straddles its neck and backs the calf into a corner. The pail of milk should be held in one hand and the nose of the calf should be grasped with the other. Place two fingers in the calf's mouth. The calf's nose is then forced into the milk.

The cock of the walk is finally cooked in the pot.

A good joke must have a good point, but it should never be aimed at any one in particular.

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