

is still damp without breaking any of the small roots. Plant them at once in your nursery.

It is very difficult to collect pine and spruce seed. Early in the spring, when the ground is still soft and spongy, in the pastures near where those trees grow, you will see a number of young pines and spruces that you can pull up very easily. Plant them at once; for that kind of tree you must shelter from the sun until they are well rooted.

Whenever the ground of a garden has been dug up and worked in the fall, if there are any maple or ash growing in the neighborhood it will be noticed that the ground in the spring is more or less covered with maple and ash seedlings grown from the seeds fallen from those trees. It takes a very little time to pull up and replant hundreds of them, and scarcely any of them will fail; of course, they must not be pulled up too roughly or it may damage the delicate roots. If the ground is too hard use a trowel. As much as practicable, they ought to be pulled up when they have only got their two first leaves, which are easily known by their peculiar shape, long and narrow, from one inch and a half to two inches long and about a quarter of an inch wide.

For several years past I have been seeking the cheapest and at the same time most effective mode of restoring the woods where they have been completely destroyed. Many of our old settlements are completely denuded of trees, and I can recommend this simple mode as the best from my personal experience. Let those who suffer for the want of fuel, of timber for building, of trees for shelter and ornament, and those who would like to have a sugar maple grove at their door, let them start their own nurseries this very summer. It will entail no expenditure of money, take but very little time, and repay them bountifully. It will be a pleasure for me to give any further information and advice to all those who may apply for it.

Ottawa.

H. G. JOLY DE LOTBINIERE.

ENTOMOLOGY.

The Fruit Bark-beetle (*Scolytus rugulosus*, Ratz.).

BY DR. JAMES FLETCHER, DOMINION ENTOMOLOGIST, OTTAWA.

I regret to state that I have received specimens of this very injurious enemy of fruit trees (now for the first time recorded in Canada) from Kingsville, in Essex Co., Ont. The Fruit Bark-beetle has done much harm of late years in the States of Indiana and Ohio, as has been recorded by Prof. Webster, State Entomologist of Ohio. This is a European insect which in some way was introduced into this country about twenty years ago, the first specimen being found at Elmira, New York State. Since its introduction its injuries have been considerable. It attacks severely all stone fruits, the plum, peach and cherry suffering most. It has also done much harm to apple and pear trees in some localities. Its injuries are recorded in many of the Eastern States and as far west as Illinois and Missouri. In addition to the above fruit trees, the Fruit Bark-beetle attacks also the mountain ash, the hawthorn, and the elm. As a general thing the Scolytidae, or Bark-beetles, attack only such trees as are lacking to some extent in vigor. This, however, is not always the case, and even if it were there is still ample scope for them to injure the fruit-grower considerably by destroying valuable trees which might have been saved by special treatment. It would appear, however, that the Fruit Bark-beetle never attacks perfectly healthy trees; but, as it is capable of doing much harm, it will be well for all fruit-growers in Western Ontario to examine their orchards and, if any traces of the beetle are found, to send specimens of bark at once for examination. If they do not wash their trees regularly every year to prevent the attacks of borers, they should now adopt that wise practice.

The perfect insect of the Fruit Bark-beetle is a small, black, cylindrical beetle, only about 1-10 of an inch in length (Fig. I.), having the tips of the wing-cases brownish. It is somewhat cylindrical in general form, and is well provided with true wings beneath the short, hard wing-cases. It flies readily from tree to tree, and may be found on the trees at the end of May and in August. The females bore into the bark (Fig. II.), leaving small round holes. They then work under the bark and form galleries or long chambers (Fig. III.), in which they lay small white eggs. From these, in due time, hatch out white grubs (Fig. IV.). The young grubs at once begin to eat tunnels under the bark at right angles to the egg chamber. These tunnels increase in size with the bodies of the grubs, as they get further from the starting point, and finally curve a little so as at last almost to run longitudinally along the stem. When the

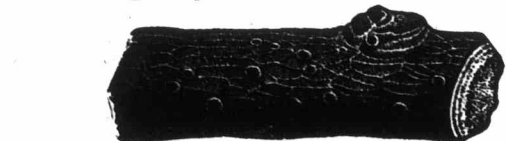


FIG. I.—Fruit Bark-beetle (much enlarged.)



FIG. II.—Bark, showing small round holes.

grubs are full-grown, they bore down a short distance into the wood and turn to pupae, from which a little later the perfect beetles emerge and

eat their way out through the bark over where the pupae were formed. There are two broods in the year, the winter being passed as an almost full-grown grub, which becomes a perfectly formed beetle in the latter part of May or early in June. This brood lays eggs, from which develop the beetles that appear on the trees in August.

Remedies.—As stated, these beetles, as a rule, attack weakened or unhealthy trees. The first thing, therefore, to attend to is the invigoration of the tree. If trees are growing in sod, this should be plowed up in the spring for some distance around the trees and a good liberal dressing of manure worked into the soil. If nitrate of soda is preferred as a fertilizer and as quicker-acting in its effects, the trees may be stimulated by light applications of this material. Probably the easiest way to use this will be to water the trees during the growing season at short intervals, say once a week, with a solution of nitrate of soda, at the rate of one pound in fifty gallons of water. For ten-year-old plum or cherry trees two or three gallons will be about the right quantity. The nitrate of soda may also be scattered dry under the trees, where it will soon be dissolved



FIG. III.—Chambers or galleries beneath bark.

by rain and washed down to the roots. Two or three light dressings are better than one heavy one. Whatever method of feeding the tree is adopted, the ground should be broken and kept hoed or cultivated during the first part of the season.

The Fruit Bark-beetle, as a rule, attacks the trunk and larger branches of imported trees, but sometimes the whole tree, even to the smallest branches, is involved. In these instances there is no chance of saving the tree, and the sooner it is dug out and burnt the better. When the injury is noticed before it has gone too far, the tree should be stimu-

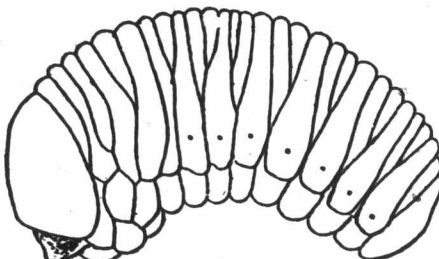


FIG. IV.—Larva of Fruit Bark-beetle (much enlarged).

lated promptly and the trunk and larger branches washed with a carbolic alkaline wash to prevent the female beetles from laying their eggs. This may be made by dissolving as much ordinary washing soda in a gallon of water as the water will take up, and then using this liquid to reduce soft soap to the consistency of whitewash or oil paint. Add to the above quantity of soda and soap wash four ounces of crude carbolic acid, and mix thoroughly. Another wash which has been used with much satisfaction by Mr. Carl E. Fisher, of Queenston, Ont., as a preventive remedy against the Peach Bark-borer, is made as follows: Washing soda, five pounds; soft soap, three quarts; water to make six gallons; air-slaked lime to thicken like paint. To this add three tablespoonfuls Paris green and one ounce carbolic acid. Apply with a whitewash brush, in May and late in July, thoroughly covering the trunk and for some distance up the branches.

Arsenate of Lead as an Insecticide.

This arsenical insecticide has been recommended by a number of experimenters as a substitute for Paris green, principally on account of its greater adhesive qualities. I tested it at Ottawa in 1895, 1896, and 1897. The results in 1895 were very striking in preventing injury from codling moth. The work of the last two years also indicate that it is an effective insecticide. The formula used was prepared by dissolving 1 ounce of arsenate of soda in 1 quart of water, and 1 ounce of acetate of lead, separately, in an equal quantity of water. The two solutions were then poured together and diluted with water to a five-gallon solution. For a barrel holding 50 gallons of water, the formula would be 5 ounces arsenate of soda to 7½ ounces acetate of lead.

As an instance of the results in one case, two trees of orange crab were sprayed three times with this solution. The two trees yielded 5 bushels of crab apples with an average of 5 wormy specimens in each bushel. One of the advantages of this mixture is that it does not need much agitation to keep the liquid of equal strength throughout. It is also very adhesive, and is not easily washed off; for this reason it ought not to be applied to fruit late in the season. The Massachusetts Gipsy Moth Commission has used this insecticide with excellent results in fighting the Gipsy moth. If the price of Paris green keeps up in the U. S. as it has done for the past two years, this substance, as well as white arsenic, will replace it to some extent.

Cornell University.

JOHN CRAIG.

QUESTIONS AND ANSWERS.

[In order to make this department as useful as possible, parties enclosing stamped envelopes will receive answers by mail, in cases where early replies appear to us advisable; all enquiries, when of general interest, will be published in next succeeding issue, if received at this office in sufficient time. Enquirers must in all cases attach their name and address in full, though not necessarily for publication.]

Veterinary.

Coughing and Lame Pigs.

T. W. C., Leeds Co., Ont.:—"My pigs and young brood sows have been affected with a bad cough, which seems very hard on them. Sometimes after getting up some of the older ones are very lame. One young sow had the cough and was swelled in the hind legs, but seems to have gotten over it. They all have had plenty of outdoor exercise, and have been fed on roots, mixed grains, milk and whey, but none of them have missed a meal; but when the young pigs take the cough they do not thrive very well, and one has quite an arched back. Since taking it, I have fed charcoal, salt and ashes. Is the disease contagious, and is there any cure?"

[In all probability the pigs have contracted a cold, which has developed rheumatism in the lame ones. It would be well to house them in comfortable, dry quarters at night and run to pasture during the day. Continue giving the wood ashes and charcoal, but no salt, and obtain from the druggist the following powder: Compound liquorice powder, 2 ozs.; powdered belladonna leaves, ½ oz.; jalap powder, ½ oz. Give a tablespoonful for each mature pig, mixed with the food every day. It is not likely the disease is a contagious one. It is a strange fact that pigs getting the best of treatment sometimes contract a cough from which they generally recover in a few weeks or months. The coming warm weather and succulent pasture, along with the above medicine, will likely bring about a cure. DR. WM. MOLE, M. R. C. V. S.]

Dropsy of the Womb.

J. Y., Cartwright, Man.:—"One of my cows took sick early in March when two months from calving. She bloated badly and I thought it was compaction of the insides, and gave dose of oil at five o'clock. As this did not operate in seventeen hours I gave her a dose of salts, but she died a few minutes afterwards. I opened her and found she was filled with water. Now a two-year-old heifer, also two months from calving, has taken the same thing. Gave a dose of nitre; she made water, but the bloating did not reduce. I tapped her and about seven pails of water came out, and in the water I noticed white worms about four inches long and the thickness of a darning needle. Did not notice any worms in the first cow. The heifer calved, but only lived a day afterwards. Both were fat and looked well until within a week before they died, when they fell off in flesh, their hair got dry and stood up, and instead of springing down behind seemed to sink in and get smaller. Is the disease contagious, and what can be done for it should any more take it?"

[The condition you have mentioned is peculiar to pregnancy, and is technically called *hydrops amnii*. It consists of an excessive secretion, or accumulation, of the fluid which surrounds the foetus in the womb. The only remedy is early evacuation of at least part of the fluid by tapping the membranes through the mouth of the womb (or uterus), or, perhaps, tapping the womb and membranes through the right flank. The operation should be done only by a qualified man. After the excess of fluid has been removed a generous diet and tonic medicine should be given. The disease is not contagious.]

Unthrifty Mare.

O. W., Pendennis, Man.:—"I have a mare six years old which is always in poor condition. The mare gets six quarts of oats three times a day, good hay and good water. She appears to sweat easily, but otherwise is in good health."

[Your mare's condition is due to improper assimilation of food. I would advise you to prepare the animal for a purgative by feeding exclusively a bran mash diet for twenty hours, and then give the following dose: Barbadoes aloes, seven drams; calomel, one dram; ground ginger, two drams; syrup, sufficient to form a ball. When the physic has ceased to operate, give morning and evening, for ten days, in food: nux vomica, half a dram; powdered gentian, two drams; nitrate of potash, one dram. While giving this medicine give a bran mash, instead of oats, each night, made by boiling a teacupful of flax seed in sufficient quantity of water to scald four quarts of bran. Do not feed so much oats.]

Miscellaneous.

Shipping Pigs.

P. E. ISLANDER:—" (1) What is meant by 'pigs shipped to order?' (2) As a general thing, would you advise shipping pigs in advance of payment to strangers? (3) When purchaser resides at or near an express office, do you advise shipping C. O. D., and in the event of buyer refusing to take pig on arrival, should not buyer, in all justice, pay express charges one way? Therefore, is it not reasonable that a deposit equal to charges one way be made in C. O. D. terms? (4) Please give direction about shipping pig one to two months old on say a five-day trip? Have you found the express authorities careful in feeding en route? (5) I think I shall