Porto Rico Agricultural Experiment Etation.

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CIRCULAR No. 4.

CONTROL of the BROWN ANT
(*Solenopsis geminata*, Fab.) IN ORANGE ORCHARDS.

Excepting the scale insects the most serious pest at present affecting young orange trees in Porto Rico is the Brown, or Stinging Ant. It has already caused very serious damage to citrus stock in many localities and unless immediate measures are taken to check its increase greater loss will follow.

Ordinarily this species of ant lives in rather small colonies of about 5,000 to 15,000 individuals in nests in the soil and subsists on small seeds, dead insects, and the honey wax secreted by scale parasites. Upon becoming established in an orange orchard, however, this ant forms at the foot of the tree a nest composed of several galleries, or passages, extending to a depth of about 6 inches and having 1 to 3 openings at the surface of the soil close to the trunk. A nest may contain a dozen or more queens if it is well established, and these queens deposit the numerous eggs near the ends of the burrows, where the young ants may be found in all stages of growth. From this nest the working individuals, acompanied by the "soldiers," or large-jawed ants of the colony, pass up the tree trunk to feed upon the wax-like substance secreted by the scales and to obtain the gummy excretion from the wounds which they make in the bark of the twigs and branches for this purpose. They also frequently damage the flowers, young fruit, and terminal buds; even small twigs are sometimes completely severed by their gnawing through the tender wood in their greediness to obtain a rapid flow of the gum.

A colony of these ants may live at the base of a tree for several weeks, merely feeding upon the wax of the scales and doing no injury to the bark, but when they have once acquired a taste for the gum they seem to prefer it to the wax. The worst feature of this acquired habit is the formation of open sores at the base of the trunk; the continual biting of the margins by the ants gradually enlarges the wounds and, if not attended to, these sores spread and commingle till the tree is girdled.

In view of the fact that grave financial loss has already resulted in many of the citrus orchards of this Island through loss of trees from the attacks of this ant and through the injurious effects of various chemical mixtures applied experimentally to the trees in combating the pest, it seems advisable to urge the use of the following safe, cheap, and simple remedies which we have found to be the most practicable of a dozen or more similar mixtures.

GIRDLE PAINT.

Unless covered with some substance which keeps out the air and water, the exposed wood in the wounds of the trunk is a menace to the life of the tree, not only through loss of sap by evaporation but by rotting of the wood and poisoning of the sap resulting from water entering the cracks.

This girdle paint, which is a kind of grafting wax, is prepared as follows: 4 parts of common yellow resin and 3 parts (by weight) of linseed oil (preferably "raw") are melted together over a slow fire and boiled for about ten minutes. After removal from the fire, but while still hot, this liquid is beaten up with a small per cent of cold tobacco tea: about one-half pint of the tea to each 3 pints of the resin-oil mixture is a good proportion but this may vary with the kind of oil used, length of time of boiling, etc. The tobacco tea should be added little by little while the wax is being rapidly stirred. The addition of the tobacco tea will thicken the brown liquid to a yellowish, semi-solid wax which should retain its intense stickiness for 2 to 4 days when applied to the tree.

This wax possesses the following properties: impermeability to water and air, thus preventing drying out and rotting of wood or bark over which it is spread; stickiness, which prevents the ants passing over it until it gradually hardens on the surface; and toughness, which prevents the ants gnawing through it, thus allowing the wounds to heal over with new bark. A small paint brush is well adapted for applying the wax, which should be of the consistency of thick cream at ordinary temperatures. It should not be applied while the bark is wet. In bright sunshine this wax will run slightly after being applied.

For stopping the passage of ants up the tree a ring of the girdle paint about 2 inches wide is made around the trunk just above the surface of the ground; by putting a second ring about 6 inches above the first the ants are usually frustrated in their attempt to regain passage to the branches by carrying up particles of earth to form a quasi-bridge over the lower ring. All branches and weeds affording direct passage between the ground and tree top must be removed at the time of applying the rings. Unless used in conjunction with the ant killer several applications may be necessary at intervals of 2 to 4 days.

This wax should be used also for covering the wound when the "spur" is removed and for the raw surfaces left by pruning.

Either tobacco stems or dust may be steeped to prepare the tea. Water may be substituted if the tobacco is not readily procurable. The cost of this preparation should be from 10 to 15 cents per quart if the ingredients are bought in small quantities. Only the purest linseed oil (free from cotton seed oil) should be used. A small amount of tallow, about one-fourth the amount of oil used, may be added to the resin and oil and melted up therewith; this forms a wax of very durable tenacity but it is more difficult to combine with the tobacco tea in thickening it. In all cases the tea must be stirred in until no drops of the water can be seen upon its standing several hours. If this paint hardens after standing or does not spread easily with the brush, it may be remelted with a very small quantity of oil added.

ANT KILLER.

Since the Girdle Paint can only prevent the ants from injuring the tree to which it is applied, the following preparation is recommended for exterminating them in the grove:

Resin, 2 parts; sal soda, 1 part; tobacco tea, 1 part. Boil all together, stirring slowly over a slow fire till all the resin is dissolved. After simmering about 15 minutes, remove from the fire and add little by little 10 to 15 parts of tobacco tea, stirring rapidly for five minutes or more; this should produce a very frothy soap which contains only just enough alkali to hold the resin in solution. Apply with a large syringe or coarse-holed spray pump directly to the open holes or galleries of ants' nests.

If properly mixed a few spoonfuls of this liquid applied on top of an ant nest will sink into the passages and flow along the tunnels, killing the ants and filling up the galleries, without injuring the tree roots. If too thin it will soak into the soil and be wasted; if too thick it will not reach the center of the nest to kill the eggs and queens. The effect of this mixture upon the ants is both chemical and mechanical: the caustic action of the soda destroys the eggs and the soft parts of the adults, while the resin forms a sticky, air-tight coating over all surfaces with which it comes into contact.

This ant killer is of some use in combating the May beetle or "Caculo;" in orange orchards. When applied to the openings of their vertical burrows it runs down and kills or drives out these insects and their grubs which may be at the botton of the hole. But this should not be used in large quantities around the roots of young trees, since the caustic action of the sal soda might injure the small roots.

The ordinary fine-spray pump is not adapted to this work, since it becomes clogged easily and does not leave the mixture in a frothy state. The common garden brass cylinder syringe having a few holes in the tip serves the purpose well.

The cost of this preparation, ready for applying, should be a little less than 1 cent per quart.

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