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## A YEARLY PROGRAM IN ENTOMOLOGICAL PRACTICE FOR THE ORCHARD.

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The following program for orchard practice in entomology is designed to suggest to the orchardist what enemies are most apt to cause him trouble, when to look for them, and what to do to forestall them. Not all of the enemies mentioned are apt to occur in injurious numbers the same season in one orchard, but since several of them are sure to be present, the best practice is to keep a lookout for all, and omit only such operations as are proved unnecessary by examination. If careful attention is given to this program for two or three years, the number of operations necessary will be found to constantly diminish until the really important ones will be found to consist in a few regular sprayings each season for those insects which are always present, and an occasional campaign against a pest of secondary importance, which for awhile has become worse than usual.

### ORCHARD PROGRAM

#### Apple.

##### JANUARY

1. Pick off clinging dead leaves and burn.
2. Feed the winter birds in the orchard.
3. Prune out egg-masses of tent caterpillars, etc.

##### FEBRUARY

1. Continue the work unfinished from January.
2. If banding is needed for canker worms, put on bands, soon after the middle of this month.
3. Scrape off the loose bark from the trunk and large limbs with a sharp hoe.
4. Remove cocoons of Fall webworm and similar hibernating forms from cavities, etc.

## MARCH

1. Continue any unfinished work of preceding months.
2. Prune out twigs on which eggs of plant lice are numerous, also those containing eggs of tree-cricket and buffalo-tree-hopper.
3. Fill up cavities in trunks with cement, first cutting out all rotten wood and singeing the cut surface with a blast lamp.
4. If San Jose scale is present, spray with lime-sulphur wash. Oyster shell scale and Scurfy bark louse may be treated in the same way.
5. Construct suitable bird houses, so as to entice insectivorous birds to nest in the orchard.

## APRIL AND MAY

1. If budworms or case-bearers are present in large numbers, spray with arsenicals just before leaf buds burst. Omit unless these insects are present.
2. For the two insects just mentioned in preceding paragraph, make a second spraying about a week later than the first, or just when the leaf buds begin to show green at the tips.
3. Just before the blossoms open, spray with Bordeaux, combined with an arsenite, for canker-worms, tent caterpillars, plum curculio, scab, leaf spot, etc. A very important application.
4. Just after the blossoms fall, or while they are falling, repeat the foregoing for codling moth, canker worms, curculio, tent-caterpillars and fungous diseases. Very important against codling moth.
5. About seven or ten days after the last spraying, directed in No. 4, repeat for the same troubles.
6. Examine trunks and large limbs for borers and destroy all found with knife, probe or carbon bisulphide.

## MAY AND JUNE

1. If plant lice or aphids become threatening, spray with whale oil soap, one pound in seven gallons of water.
2. In late May or early June the eggs of Scurfy scale and Oyster shell scale begin to hatch and, as soon as hatching period is completed, the young can be destroyed with kerosene emulsion, one part to nine of water, or with one pound of whale oil soap dissolved in seven gallons of water.
3. A shallow fountain or tank which affords a drinking and bathing place for birds throughout the summer will do much to encourage their presence.

## JUNE

1. Where the banding method of fighting codling moth is used in conjunction with spraying, put the bands in place about the first of June.

## JULY

1. Spray about the last week in July with Bordeaux, combined with an arsenite, for second brood of codling moth, tussock moth, yellow-necked caterpillar, fungous diseases, etc.
2. In the latter part of July look for young colonies of the yellow-necked caterpillars feeding gregariously on under side of leaves. Cut off infested branches while worms are young and destroy.

## JULY AND AUGUST

1. During the months of July, August and September, keep trunks and larger limbs covered with white-wash or with carbolized whale-oil soap spray to prevent borers.

## SEPTEMBER AND OCTOBER

1. When webs of Fall webworm are observed, either cut out the branches to which web is fastened and burn, or destroy nest while on tree by holding a lighted torch beneath it.

## NOVEMBER AND DECEMBER

1. Clean up and burn all fallen limbs and so far as possible reduce the number of hiding places for hibernating insects. Consult Winter Manual of Economic Practice (Bulletin 164 of this Station).

**Pear.**

The Pear is to a large extent subject to the same insects and diseases which attack apple. The program for care of the apple orchard will, therefore, serve very well for the pear orchard also. The following additions are made, relative to insects which are special pests of the pear:

## MARCH

1. When buds are swelling, spray with lime-sulphur wash for Psylla and for Blister-mite of the leaf.

## JUNE

1. As soon as pear-tree slugs appear on the leaves, spray with an arsenite, with kerosene emulsion or with decoction of white hellebore; or apply mixture of hellebore with flour or lime with powder gun.

**Quince.**

Follow the same schedule of examinations for quince insects as for apple and pear, and when apple and pear insects are found attacking it, employ the methods given for these insects. The apple borers and the codling moth attack this fruit. The quince curculio comes from late May until July and may be fought by jarring.

**Peach.**

## JANUARY FEBRUARY AND MARCH

1. The program is substantially the same as that given for apple.

## APRIL AND MAY

1. If San Jose scale is present, spray with lime-sulphur wash. This will also prevent leaf curl.

2. Two or three sprayings with arsenate of lead may be given to prevent curculio, or jarring may be commenced as soon as the trees are in blossom and should continue for six or eight weeks. Spraying should be made with arsenate of lead only, and in combination with weak Bordeaux, or in water alone. First spraying, as soon as leaves begin to appear, and the others at intervals of ten days or two weeks.

3. Examine the base of trunks beneath the surface of the ground, and all gummy places, for larvæ of peach borer. Destroy borers with knife or boiling water.

4. If plant lice become abundant, spray with whale oil soap, one pound in seven or eight gallons of water.

## JUNE

1. Early in month, mound up trunk of tree with fine earth to a height of eight or ten inches and pack tightly to compel borer moths to lay their eggs high on the trunk; or spray trunks with carbolized whale oil soap spray, and repeat this treatment once each month, ending with September. This will act as check against all borers.

2. If pigs are pastured in the orchard this month, and for two or three weeks following, they will devour the curculio larvæ and break up the pupal cells of the insect in the earth. Cultivation during these months will accomplish the same result; not practicable where the grass mulch system is used.

## AUGUST

1. About first of month, examine for peach borer larvæ and destroy all found.

## OCTOBER

1. Make second examination for peach borer larvæ and destroy all that are found.

## NOVEMBER AND DECEMBER

1. Clean up fallen limbs, etc. Consult Winter Manual (Bull. 164.)

**Plum.**

## JANUARY, FEBRUARY AND MARCH

1. Follow substantially the same program as for apple.
2. If Eulecaniums or soft scales are present, spray with kerosene emulsion, one part to four or five parts of water.

## APRIL AND MAY

1. Curculio is the principal offender at this time and may be treated as given for peach.
2. If plant lice are troublesome, spray with whale oil soap, one pound in seven or eight gallons of water.

## JULY AND AUGUST

1. Follow program given for apple and peach, against borers.

## AUGUST

1. Peach borer should be sought for and destroyed where found.

## OCTOBER

1. Repeat examination for peach borer larvæ

**Cherry.**

Follow same program as for plum, keeping special lookout for soft scale, curculio and plant lice. Slugs also attack cherry and may be treated as given for pear slugs.