

The "Adco" products are not suitable to our Indian climate and if used will result in serious loss of nitrogen. Analyses of organic compost obtained from various grades of stuffs under varying conditions are set forth and discussed. Based upon the experience gained, a working formula suitable for the production of composts under Indian conditions is described.

The effect of compost thus prepared has been compared over a series of years on crops against farmyard manure and the results of yields obtained are discussed.

The composition of the crops as regards quality compares favourably with those raised with farmyard manure.

The economics of the process are laid down and the modifications necessary in handling night soil are indicated.

The results of field trials warrant the preparation and use of organic wastes profitably in the form of organic compost on an extensive scale.

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## AN AGROMYZID FLY PREDACEOUS ON APHIDS

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**Introduction.** This short note deals with the life-history and habits of a beneficial insect, a fly\* whose maggots are predaceous on Aphids (sucking insects)—one of the worst pests of cultivated crops. Along with Hover flies (*F. Syrphidae*), Lady-birds (*F. Coccinellidae*) and Lacewings (*F. Chrysopidae*) these fly maggots attack aphids on a large scale and destroy them in numbers. As this insect is one the farmer should be familiar with and protect as far as possible, a short description of its various stages is given below.

**Life History.** *Eggs* (Fig. 1) are laid singly by the female flies on plants infested with Aphids. These look like the Syrphid eggs being oval and white, but are smaller. These measure 0.36 m. m. in length while the Syrphid eggs are 0.8 m. m. long. Again the ridges found on the *Leucopis* eggs are longer than those of the Syrphid eggs. Also the *Leucopis* eggs have both ends more or less pointed while in the Syrphid eggs one end is slightly broader than the other. The egg period lasts two to four days.

**Larvae.** The newly hatched maggots (Fig. 2) which are about 0.45 m. m. long are pale white in colour. Unlike the young Syrphid maggots, hairs are absent on the body. Two short tubular out-growths from the dorsal aspect of the anal end directed backwards and outwards, which are the beginnings of the long larval respiratory

\* *Leucopis* sp. Sub-family—Ochthiphidinae. Family—Agromyzidae.

processes of the mature maggot are dimly visible. The maggots soon after hatching feed on the Aphids by sucking out their body contents and begin to grow in size. They moult twice before pupation. In the mature maggots (Fig. 3) the pale white colour changes to that of yellow and the anal 'horns' are longer\* and more prominent, their tips being black. A detailed examination of the 'horns' under the microscope reveals the prolongation of the lateral tracheal tubes into the horn like processes which end in three-branched claw-like structures. The full grown maggots are about 2.5 m. m. long. Before pupation the maggots exude a cement-like white fluid, probably for attachment, which hardens and turns black in colour in a couple of hours. The larval period lasts four to five days.

**Pupae.** The pupae (Fig. 4) are dark brown in colour and look similar to the mature maggots but are more stumpy. These are about 2.2 m. m. long and 1 m. m. broad. In five to seven days the adults emerge by pushing their way out at the anterior end of the pupae.

**Adults.** Adult flies (Fig. 5) are very active creatures, short and stout and measure about 2 m. m. long. The general colour of the fly is greyish dark. Antennae including arista are dark and the halteres pale yellow. The abdomen is grey with a round black spot on each side of the median line of the second tergite. Legs are light dark. Adult flies have been noted feeding on the honey dew of Aphids. A fly fed with jaggery water in captivity lived 21 days. The total life cycle lasts 11 to 16 days.

**Hosts.** Fly maggots have been observed feeding on Aphids on a variety of plants such as Cholan (*Sorghum*), Cotton (*Gossypium*), Cumbu (*Pennisetum typhoideum*) and beans (*Dolichos lab-lab*).

**Parasites.** A few *Chalcids* were once collected from a *Leucopis* pupa but in nature the number of such parasites seems to be very few.

## GRAM WEIGHT IN RELATION TO POD AND SHOOT WEIGHTS IN BENGAL GRAM

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**Introduction.** In preliminary yield trials of crops the plant breeder has often to handle a large number of types although only a few of these can be carried forward. It is a practical consideration that the methods adopted at such a stage allow examination of as wide a range of material as possible with the minimum of labour and without loss of efficiency. Each crop sets its own problem in this connection.

\* Since sending to the press a few maggots with shorter respiratory horns, probably another species of *Leucopis*, have been collected feeding on Aphids and are under study.