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Circular of Information No. 139

March, 1936

THE CHRYSANTHEMUM MIDGE (*Chrysanthemum* Gall-Fly)

by

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Description:

The chrysanthemum midge, *Diarthronomyia hypogaea* (F. Low) is a fragile, two-winged fly about one-fourteenth inch in length. It belongs to a family of insects whose immature or larval stages frequently cause galls on plants. The galls caused by the larvae of this insect are cone-shaped, about one-twelfth of an inch long, and which generally project obliquely from the surface of chrysanthemum leaves and terminals.

Importance:

This insect is now considered one of the most important pests by the chrysanthemum growers and complete loss of chrysanthemum stocks has been reported.

Life History Important in Control:

There are two periods, spring and fall, in which these insects become serious in greenhouses. The spring occurrence starts about the middle of February and lasts until early June. The fall occurrence starts in late August and continues until late November.

A complete cycle from egg stage to egg stage requires between 27 and 50 days in a greenhouse. Eggs generally are deposited on the terminal growth of the plants and hatch in 3 to 16 days. After hatching, the larvae move about the plant for one to three days before entering the tissues. Irritation set up by the larvae results in the formation of the galls by the plants. The fully formed adult emerges at night between 1 A. M. and 5 A. M. Mating and egg laying take place almost immediately. The fertilized females live about 24 hours, and the males only a few hours. From the above outline, the importance of applying control measures at the correct time is apparent.

Control:

In cases of light infestation, daily picking of the gall-infested leaves will hold the midge in check. In heavy infestations the most severely affected plants should be destroyed and the balance either fumigated or sprayed as outlined below:

Spray - Nicotine sulfate (40%) one part in 800 parts of water (1 ounce or 2 tablespoons to 25 quarts) with the addition of 1 ounce soap (preferably fish oil soap) to each gallon of solution.

This spray is applied in the late afternoon to reduce the danger of burning. Regular applications every three or four days for about forty days are necessary to prevent the occurrence of infestations later in the season. The nicotine spray is effective for both adult flies and eggs. Thorough coverage is essential.

Fumigation - Hydrocyanic-acid gas. Possibly the best material to use for developing this gas is calcium cyanide either as powder or as granules. The dosage for calcium cyanide is $\frac{1}{4}$ ounce of the pure chemical per 1000 cubic feet of space. After determining and weighing, the desired amount of calcium cyanide is placed in a glass jar. (A screw top jar makes a handy device for scattering the cyanide when the cap has been removed from the top and holes are punched, preferably from the inside out, with a nail). The cyanide is scattered evenly along the walk with the worker walking backward toward the door. Care must be taken that the material does not touch the plants or serious injury will result.

Application of calcium cyanide should be made after dark and fumigation should continue 10 or 12 hours when the temperature is around 60° F. and the humidity not higher than 80%. The long exposure to the gas is necessary as it is evolved slowly when moisture is taken from the air. Nightly application for a period of about six weeks is required to control the adults when they emerge to prevent egg laying.

The above dosage is for the pure calcium cyanide. Commercial preparations are generally diluted with an inert material and are usually accompanied with directions and dosages.

CAUTION: This gas and the materials used to produce it are extremely poisonous. Every precaution should be used in handling and fumigating with this material. The use of this gas for control is not recommended unless an experienced fumigator is available.

Fumigation - Nicotine. Several methods of nicotine fumigation have been suggested. Tobacco paper or nicotine paper has been recommended at the rate of one sheet to each 1000 cubic feet of space. The paper is lighted and the flame blown out, allowing it to smoulder. Burning free nicotine (95%) with sawdust at the rate of one ounce to each 4000 cubic feet of space has also been recommended. Free nicotine at the same rate (1 ounce to 4000 cu. ft.) may be painted or poured on the heating pipes to produce nicotine fumes.

The use of nicotine for fumigation must also be nightly, starting at 12:30 A. M. to 2:00 A. M. for 30 to 40 nights, to be effective against the adult flies.

Prevention:

1. Examine all chrysanthemum material for galls before planting to prevent infestation.
2. Dip suspected cuttings in a solution of nicotine sulfate (40%) of the same formula as suggested above for spraying.
3. In extreme cases grow chrysanthemums under cloth, starting with clean stock.