

Dogwood Club Gall



Deformed leaves suggest the presence of maggots in tips of dogwood branches.

John C. Schread

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Notice

The accompanying publication, printed some years ago, contains descriptions and biological information, and suggestions for control by spraying. It suggests the use of DDT.

Present regulations of the State Board of Pesticide Control restrict use of DDT by custom spray operators for this purpose.

Carbaryl (Sevin®) or lindane may be used to control these pests.

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THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

CORRECTION TO BE MADE IN CONNECTICUT AGRICULTURAL EXPERIMENT STATION CIRCULAR 225

In the third full paragraph on page 3, the second sentence should read:

In 1962 an average of 8.6 with a low of 1 and a high of 56 maggots
were found per gall.

Dogwood Club Gall

John C. Schread

The dogwood club gall was recorded as a very common deformity on the flowering dogwood tree by Felt in 1939. Since that time it has been seen occasionally wherever the trees are grown as ornamentals and on those growing naturally in the woods. This gall, caused by infestation with the larvae of *Mycodiplosis alternata* Felt, has become a serious pest at one location in Connecticut.

Life History and Habits

The orange-colored maggots overwinter on the soil under dogwood trees. The maggots emerge through a small, round opening which they chew through the side of the gall. It is recognized by a grayish scar tissue. There is usually only one exit hole in a gall, however in 1963 an examination of 50 galls indicated a total of 55 exit holes; 34 contained one or two, and one, three exit holes.

By August 29, 1962, maggots had emerged from 3 of 44 galls. An examination of 28 galls on September 14 indicated 3 from which some or all maggots had emerged, 4 contained parasites, and no maggots had emerged from 21. On October 8 an examination of 64 galls showed that maggots had emerged from 34 of them; 13 contained parasites and 17 contained dead maggots. It would appear from this record that all healthy maggots had emerged and dropped to the ground by October 8, 1962. The results were somewhat different in 1963. An examination of 79 galls on September 23 showed emergence of all maggots from 31 of them. As late as October 28, 5 maggots were found in about 12 galls. On November 1, 54 galls were found to be empty, 7 contained maggots and 5 contained parasites.

An examination of the ground on November 27, 1963, under about 12 pink dogwood trees showed that the club gall maggots remained during the winter on the surface of the soil protected by dense sod and decayed grass and leaves. No cocoon-like protection was observed. Four maggots were found, none of which had pupated. Hence it is assumed that pupation does not take place until the following spring. No additional maggots were found in the upper 6 inches of the soil.

Adult midges are extremely wary. None was seen on any part of the foliage or trees during the seasons of 1962 and 1963. The time of day when they lay their eggs has not been determined. Emergence of adult midges was determined in 1963 through the use of yellow-pan water traps. One of these was kept in a cold frame, the others in the open. Single adults were captured from June 3 to July 1 in the cold frame, and in exposed traps from



Figure 1. Larvae enter the midribs of apical leaves and cause wilting.

June 7 to June 24. On two occasions (June 14 and 20) two females were caught.

Wilted and deformed leaves reveal the presence of maggots in the tips of dogwood branches. In 1962 the first indication of maggot infestation was seen on June 11. At this time two small terminal leaves were found wilted. Dissection of the tip of the branch where these leaves occurred showed several small maggots were present. They were found at the base of the petioles at the point of junction of petioles with the small leaves.

In general, eggs are deposited among the minute terminal leaves, and the maggots work their way into the interior of the base of the leaves or petioles at the point of junction between the apical pair or two pairs of minute terminal leaves. Occasionally entrance may be through the leaf tissue adjacent to a midrib and from there into the midrib. Such entrance may be at any point from about the middle of the leaf to its base. Most often these small infested leaves curl as indicated in Figure 1. One or more (2 or 3, rarely 4) of the terminal leaf petioles may be mined during the initial maggot entrance.

The maggots cause a cavity to develop within the gall in which they live. In 1962 an average of 8.6 with a low of 1 and a high of 6 maggots were found per gall. In 1963 there was an average of 14.2 (1 to 39 per gall). The developing maggots were whitish, the mature, orange-yellow.

Felt indicated "... the eggs are laid on the most vigorous twigs while the nodes are close together in the developing bud and the vigor of the twig was such that there was a nearly normal elongation of the shoot in spite of the swellings." Observations during 1962 and 1963 strongly support this statement.

Pink dogwood trees seemed to be more seriously infested than white ones. More than one gall occurred on a single twig. Usually the fastest growing twigs were most heavily infested. An examination of August 30, 1963, showed five galls on a 20-inch twig. One or two is more nearly typical. Usually water sprouts or sucker growth nearest the ground showed the heaviest infestation. Dehorned trees with fast growing tips were also in this class.



Figure 2. The maggots cause a cavity to develop within the gall in which they live.

The Adult Midge

The delicate adult of the dogwood club gall is about 2 mm. long. The abdomen is bright orange; the thorax is yellow-orange or duller. The wings are mottled with varying patches of black and yellow hairs which in some specimens give the impression of irregular, black and yellow bands. The male antennae are about the same length as the body. The joints are bead-like in appearance. The female antennae are shorter and less conspicuously adorned. A whorl of long, black hairs occurs at the base of each antennal segment, with fewer shorter ones near their apex. The last four or five distal segments are dusky and the two basal ones are yellowish to orange. The middle segments are orange-yellow.

The last tarsal joint of each leg is orange-yellow. The apex of each leg joint and the base of the first joint is black while the remainder of the joints are orange-yellow. The apex of the femur and tibia, the base of the middle femoral joint and their inner surface are partially clothed with black hairs.

There are patches of long, black hairs on the side of each abdominal segment, and a few black hairs occur on the sides of the thorax. The compound eyes occupy most of the head and are shiny black.

Damage to Trees

A serious infestation of dogwood club gall stunts the tree. A light infestation in a large tree will hardly be noticeable. Most of the flower and leaf buds which develop beyond the apex of the galls die. Hence a small tree heavily infested may be a complete loss. The galls, with their terminal shriveled and dead leaves, may hang on the tree for a year or longer. The galls vary in length from less than $\frac{3}{8}$ to 2 or more inches. They taper at both ends and may be from $\frac{3}{16}$ to $\frac{5}{16}$ of an inch in diameter at their broadest point.



Figure 3. Most of the flower and leaf buds which develop beyond the galls die.

Parasites

A small chalcid parasite of the maggot of the dogwood club gall has been identified as *Platygaster*¹ sp. A few individuals were first seen on May 25, 1962. From then on only an occasional one was observed until June 4, at which time several hundred were noted. Very few occurred in 1963.

Chemical Control

Insecticides were used for two seasons to control the dogwood club gall. In 1962, two phosphate compounds controlled the infestation. The one now on the market injured the foliage seriously; the other has not been labelled for use. In 1963, DDT and Sevin were used as sprays.

¹ A new species identified by C. F. W. Muesebeck, U. S. National Museum.

Experiments in 1963

The experiments in 1963 were intended to determine the effectiveness of DDT and Sevin sprayed on the trees at weekly intervals from late May until the end of June. One block of pink and white dogwood trees having 70 rows with a total of 340 trees was selected for the tests. There were from 4 to 9 trees per row; their average height was 10.5 feet. The block was divided longitudinally so that on May 22 one-half of the trees could be sprayed with 25 percent DDT and the remaining one-half with No. 4 Sevin flowable. Both materials were used at the rate of 2 pints per 100 gallons of water applied with a 150-gallon hydraulic sprayer. Triton B1956 wetting agent was used at the rate of 4 oz. per 100 gallons. The blocks were sprayed again on May 31 and June 7.

After June 7, both the DDT and Sevin sprayed blocks were subdivided so that 45 rows were sprayed June 14 (to provide four treatments); 30 rows were sprayed June 21 (to provide five treatments) and 15 rows were sprayed June 20 (to provide six treatments).

Control data were taken on November 14. Gall counts were made on 10 trees in each block. Because of the large number and size of the trees, counts were made on only one-quarter of each tree (the south side was chosen) in a 20-inch vertical area, starting 4 feet from the surface of the ground. The 10 trees were selected on the diagonal of each block.

Table 1. Control of dogwood club gall with DDT and Sevin

No. of Treatments	Total number of galls on 10 trees	
	DDT plots	Sevin plots
3	40	36
4	20	7
5	3	2
6	0	0
Untreated, 155 galls on 10 trees		

Excellent control of dogwood club gall followed spraying with DDT and Sevin when more than three treatments were used. This is somewhat more noticeable in the Sevin sprayed plots.

The author acknowledges with thanks the assistance of Mr. Alfonzo DeCaprio in conducting the 1963 experiments and of B. W. McFarland, who made the photographs.