

Devices for Marking Insects¹

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Fluorescent ultra-violet transparent lacquers and water colors which glow in the dark when ultra-violet (blacklight) is turned on them can be employed in the studies of insect migration, longevity and life history.

The lacquers were diluted to the desired consistency with 95 per cent alcohol, which dries upon the specimens immediately when discharged as a fine spray. Water colors did not prove effective due to rainy weather conditions prevailing at the time of the sawfly markings, and are recommended only for temporary markings or when the use of alcohol as a thinner is not desired.

Use of Lacquers to Study Sawfly Migrations

Adult sawflies were collected and marked with yellow, green and red lacquer fluorescent dyes at Minot, North Dakota. A separate color was used on each of three consecutive days. Inspection checks were made on succeeding days after insects were marked and released. The collected insects were examined under ultra-violet light and the distance traveled is recorded in Table 1. Only those insects marked would fluoresce. Two 18 inch fluorescent tubes were used, the kind which can be readily installed in a standard fluorescent desk lamp.

Table I. DISTANCE IN FEET TRAVELED BY MARKED SAWFLIES AT MINOT, NORTH DAKOTA, JUNE 11-18, 1950.

PLOT I	1st day	2 days	3 days	4 days	5 days	6 days
1st release	60	60	30		60	
2nd release	105					90
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PLOT II						
1st release	30	120			60	
2nd release	60					
*3rd release		90				
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**Plot III						
1st release	30					
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***PLOT IV						
1st release		100				

Adverse weather conditions of heavy dews, rain, high winds, cloudy weather and continued cool temperatures during the sawflies hatching period limited the results of the investigations.

*Heavy prolonged rain after release.

**Due to chilling and dampness 95 percent mortality of released flies occur.

***Heavy rain on day following release destroyed markings.

¹Partial progress report on BJO 77 "Biology and Control of Wheat Stem Sawfly, *Cephus cinctus* Norton."

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As a result of marking and releasing adult sawflies it was found that they are able to migrate 105 feet across a grain field in 24 hours and up to 120 feet in 48 hours. Adult sawflies live at least seven days.

In the sawfly investigations it was found that grasshopper nymphs, *Melanoplus* sp. in the second instar traveled as far as 100 feet in 24 hours. One small immature spider was also found to have migrated over 100 feet in 24 hours after release.

Aphid Migration

Aphids, *Myzus persicae* (Sulz.) were marked with both water colors and transparent lacquers. They were then allowed to become established on potato plants for 24 hours. The plants were then rouged. Three days after rouging, the aphids had migrated up to 59 inches and were recovered from adjacent weeds and potato plants. The work initiated at North Dakota Agricultural College Experiment Station in 1949 has great possibilities in biological studies of fragile insects. Detailed notes on the equipment and concentration are on file in the department of agricultural entomology, and sources of material will be sent upon request.

SAVING FARMERS A BILLION

An important type of transportation work by the USDA deals with obtaining fair and equitable rates, services, and charges for moving farm and food products from farms to markets. In this capacity the department represents shippers of farm products before the Interstate Commerce Commission and other transportation regulatory agencies so that they may be fully informed of the shippers' position in freight-rate hearings. This work by Production and Marketing Administration's Marketing Facilities Branch is authorized by the Agricultural Adjustment Act of 1938 and the Research and Marketing Act of 1946, Section 203.

The cost of transporting farm products from farm to consumer now amounts to two or more billion dollars a year and comprises a significant part of marketing costs. Therefore, it is of great importance to farmers that transportation charges be kept reasonable, and that they obtain satisfactory transportation services for the charges they pay. An unreasonable freight rate to a given market acts in the same way as tariff barriers against the movement of that produce to market.

Whenever it is determined that action on freight rates in behalf of farmers is necessary, the branch contacts the carrier or carrier rate bureau to see if the desired rate adjustment can be worked out. If not, a formal action is filed in the name of the Secretary of Agriculture with the Interstate Commerce Commission or the appropriate commission having jurisdiction over the matter. Then all available evidence is assembled and presented at the hearing where both oral testimony and exhibits are offered.

From 1938 through June 30, 1948, the Marketing Facilities Branch participated in 667 formal cases, most of which were before the Interstate Commerce Commission. It has been estimated that this transportation activity, including many cases in which the USDA assumed leadership, has made a difference in freight costs of fully a billion dollars in the farmer's favor.—USDA.