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Control Of Soil Insect Pests In Gulf Coast Irish Potato Fields

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WIREWORMS and the imported fire ant are serious pests of the Irish potato crop in the Gulf Coast Area of Alabama. The wireworm attacks both the seed pieces after planting, and potatoes after they are set on the plants. Damage to seed pieces results in reduced stands or lowered plant vitality. Wireworm punctures in market potatoes can lower the grade or keeping qualities. The imported fire ant reduces stands by feeding on the tender seedlings, or lowers the grade of market potatoes by feeding on them; however, the most obvious ant problem is its painful sting to persons picking up potatoes during harvesting operations.

Experiments on the control of wireworms and the imported fire ant in Irish potatoes were begun in 1955. Control measures reported here are based on results from these experiments.

WIREWORMS

Wireworms are immature forms of the common click-beetle or skip-jack. The species found most frequently in potato fields of the Gulf Coast Area of Alabama is the Gulf wireworm, *Conoderus amplicollis* (Gyll.). Adult beetles are approximately 3/8-inch long and 1/8-inch wide. They are dark brown and have a velvety appearance.

The life cycle of the Gulf wireworm is completed in 1 year. Adult females deposit their eggs on or near the surface of the soil during May and June. The eggs hatch in 8 to 10 days, depending on temperature. Young larvae begin feeding immediately and attain most of their growth in 8 or 10 weeks. By the end of November the larvae are almost fully grown and very little growth occurs from December to February. Duration of the larval period is about 10 months. Full-grown larvae are about 3/4-inch long and nearly 1/8-inch wide. They have hard, shiny, yellowish brown bodies and dark brown or black heads. Pupation occurs in an earthen cell in the top layers of the soil during April, May, and June; length of the pupal period is approximately 8 to 10 days. Adult beetles emerge in May and June, with a small percentage

emerging in July. The life history of this insect was determined by Cockerham and Deen¹ during the period of 1929-32.

IMPORTED FIRE ANT

The imported fire ant, *Solenopsis saevissima v. richteri* Forel, was probably introduced into the United States at Mobile, Alabama, about 1925. It is a mound-building fire ant. An average mound is about 15 inches in diameter and 10 inches high, and contains about 25,000 workers. The workers range from 1/8- to 1/4-inch long and are reddish to reddish black.

An ant colony begins when the queen digs an underground chamber and starts laying clusters of smooth, shiny white eggs. The eggs hatch in 8 to 10 days. The larvae are helpless, dirty-white grubs and depend on the queen and workers for food. Larvae that become workers pupate in 6 to 12 days; those that become winged forms take a longer time to develop. Adults emerge from the pupal stage in 9 to 16 days. The entire life cycle is completed in about 30 days.

CONTROL

Four insecticides—aldrin, chlordane, dieldrin and heptachlor—gave excellent control of wireworms and fire ants in potato fields in 1955 experiments. Each insecticide was applied as an emulsion spray to the soil after it was turned, but before disking prior to planting. A mixture to treat 1 acre was made by mixing 2 pounds of aldrin, dieldrin or heptachlor, or 4 pounds of chlordane with enough water to make 30 gallons of spray.

Counts of ant mounds were made just prior to harvesting the potatoes. There were no fire ant colonies in any of the treated areas, whereas the untreated check areas had an average of 61 active ant colonies per acre.

¹Cockerham, K. L. and Deen, O. T. "Notes on the life history, habits, and distribution of *Heteroderes laurentii* (Guerin)." Jour. of Econ. Ent. 29 (2): 288-96. 1936.

Sample potatoes were taken at harvest time, and examined individually for wireworm damage. All insecticidal treatments gave excellent control of wireworms (Table 1).

TABLE 1. EFFECT OF INSECTICIDAL SOIL TREATMENT ON WIREWORM DAMAGE TO IRISH POTATOES, CLEVERDON FARM, BALDWIN COUNTY, 1955

Treatment	Percentage of potatoes damaged by wireworms
No treatment	24.2
Aldrin, 2 lb. per acre	0.2
Chlordane, 4 lb. per acre	0.3
Dieldrin, 2 lb. per acre	0.5
Heptachlor, 2 lb. per acre	0.0

SUMMARY

1. Wireworms, primarily the Gulf wireworm, and the imported fire ant are serious pests of the Irish potato crop in the Gulf Coast Area of Alabama.

2. These insecticides at the indicated rates gave excellent control of wireworms and fire ants in 1955 experiments: aldrin, 2 pounds per acre; chlordane, 4 pounds per acre; dieldrin, 2 pounds per acre; and heptachlor, 2 pounds per acre. In each case, the insecticide was mixed with enough water to make 30 gallons of spray.

3. The insecticides were applied as emulsion sprays to the soil after it was turned, but before disking prior to planting.