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DAMAGE TO CORN BY THE RED IMPORTED FIRE ANTS

Little is known of the ant as a destroyer of crops (Lofgren *et al.* 1975, Annu. Rev. Entomol. 20: 1-30) however, Lyle and Fortune (1948, J. Econ. Entomol. 41: 833-4) reported that imported fire ants completely destroyed a large field of sprouting corn. Arant and Eden (1949, Ala. Agric. Exp. Sta. Prog. Rep. Ser. 42) stated that the fire ant frequently attacks germinating seed and young tender plants. Wilson and Eads (1949, Sp. Rpt. Ala. Dept. Conserv. 1-511) by systematic polling of 174 farmers in Alabama, obtained

data on crop damage by the imported fire ant. According to their report, the crops most damaged were corn, Irish potatoes, soybeans, sweet potatoes, and cabbage; estimated losses in Mobile and Baldwin Counties were $177,610 and $357,612, respectively. A USDA (1958, ARS 33-49) report stated that on one farm in Alabama the ants destroyed at least 85% of the germinating seeds on 35 acres of white field corn so the field had to be replanted, but an adjacent field of yellow hybrid field corn was untouched.

In the spring of 1976, the authors were called to investigate damage to a field of corn supposedly caused by fire ants. This note is the result of our observations.

The farm involved is located in Stonewall, Mississippi. The field involved was about 65 acres of river bottom land that was planted in corn for the first time in 1976. The land had been in pasture for 30 years and had had wheat planted on it the previous two years. Then rye grass was planted in the winter of 1975 as an initiation to planting corn by the low tillage method. At this time, very few ants were seen around the edges of the field.

In March 1976 the Chickasawhay River overflowed and flooded the field. According to the owner, "balls" of ants floated in and remained behind when the flood water receded. The farmer was not concerned about the ants at this time, nor did he believe that ants would attack corn.

Later that spring, the farmer planted 65 acres of corn, DeKalb 398, at the rate of one seed every seven inches. He reported an excellent emergence of the seedlings. Carbofuran was used as the insecticide, and paraquat as the herbicide.

When the seedlings were 8-12 inches tall, the farmer noticed that some of the plants were dying. When he examined the stalks, he found that all of the dying or injured plants had ants walking around the ground level part of the stem; when he dug the seedlings, the ants would "boil" out of the plant. He reports that the ants were eating the stem and roots and the stalk was rotting at ground level. To him, it seemed as if every plant had ants working around the stem. The farmer notified the Mississippi Department of Agriculture and Commerce (MDAC), and told them of the events, and proceeded to treat the entire field with 4X mirex bait.

The next day, a plant pathologist, F. Killebrew, from MDAC visited the farm, examined the plants and surrounding area, and reported that: (1) there were high populations of fire ants in the field at the time of his visit and there was a direct association of the ants with the damaged corn; (2) no plant diseases or soil insects were found that could have caused the problems; and (3) there were no apparent faulty cultural practices by the farmer.

Two days after the examination by the pathologist, the farmer treated the field with chlordane. The day following treatment all three authors made an examination of the corn field. Visual observation revealed many areas where plants were totally lacking. Plants that were not attacked or had survived attack were 2-3 ft tall; plants showing damage were 8-12 inches high, wilted, and had stem damage as described previously (Figures 1 and 2).

Fifty or more damaged plants were dug, the stems were split, and collections were made of any insects found in the plants or in the soil around the roots. The applications of mirex bait and chlordane had worked very well

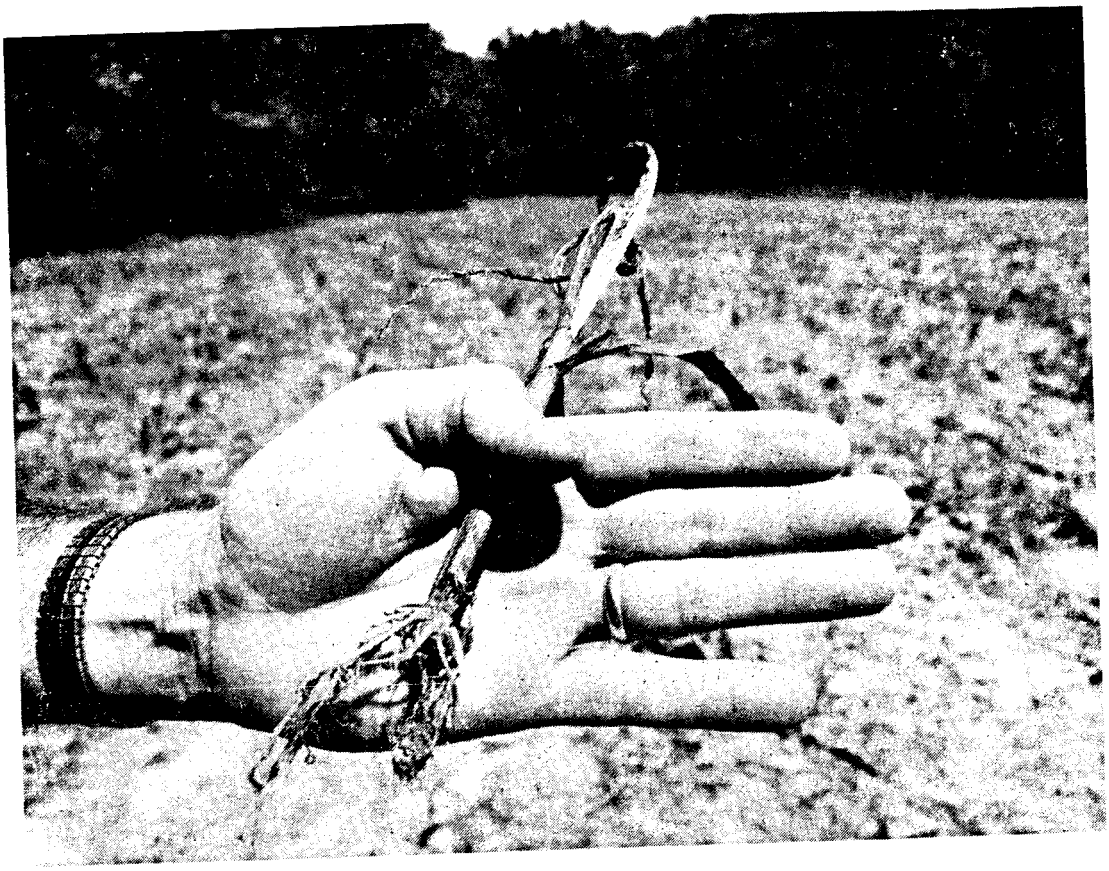

Fig. 1. – Damage to corn seedlings by imported fire ants.

Fig. 2. – Stunting of growth by imported fire ants.

since only one fire ant was found, and this, a newly mated queen. In all, we collected only four insects. No white-fringed beetles or other root-destroying insects were found at this time nor during the subsequent visit mentioned below.

Examination of the border areas showed some surviving fire ant colonies. Collections were made of these ants, and the identification as *S. invicta* was confirmed by Dr. W. F. Buren, Gainesville, Florida.

We returned two days later and set up 10 one-half acre plots to get some estimate of losses. The plots were randomly located throughout the 65 acres. Counts were made of all plants within the 10 plots.

The plant counts showed an average loss of 63.4%. The owner had estimated a 25% loss and the pathologist a 35% loss. The farmer had expected the crop to be worth $250.00 an acre. Thus, the loss, depending upon which estimate is taken, ranged from $4,000 to $10,000.

We realize that this estimate is speculative since we have no measure of undamaged corn because the entire area was attacked. Surrounding corn fields showed similar losses. Also, we have no background data on losses due to germination and cultural practices, but it is very clear that the corn had been severely damaged.

It is the considered opinion of all the investigators, based on their findings, that the damage to the corn was a direct result of the fire ants. It is a well known fact that imported fire ants are opportunistic feeders. Thus, under the conditions of stress due to flooding prior to planting of the corn, one could expect that the ants would feed on the corn roots, if no other food was available. It would be helpful to know how often and under what type of conditions this type of damage occurs. – B. M. Glancey (Insects Affecting Man and Animals Research Laboratory, AR, USDA, SEA, Gainesville, FL 32604), J. D. Coley (MDAC, Starkville, MS 39762), F. Killibrew (MDAC, Starkville, MS 39762).

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