

Reprinted from *The Florida Entomologist*, Volume 66, Number 4, December 1983.

DESTRUCTION OF EGGPLANTS IN MARION COUNTY, FLORIDA BY RED IMPORTED FIRE ANTS (HYMENOPTERA: FORMICIDAE)

—The presence of the red imported fire ant, *Solenopsis invicta* Buren (RIFA), in cultivated fields in the southeastern U.S. has been recognized since 1948, but the feeding of this species on the eggplant, *Solanum melongena* (L.), is not documented. Lyle and Fortune (1948. *J. Econ. Ent.* 41(5): 833-4), Arant and Eden (1949. *Spec. Rpt. Alabama Exp. Sta. Prog. Rpt.*, Serv. 42) and Wilson and Eads (1949. *Spec. Rpt. Alabama Dept. Conserv.*, 1-511) reported destruction of various garden vegetables and row crops by *S. invicta* with estimated losses as high as \$500,000. Glancey et al. (1979. *J. Georgia Ent. Soc.* 14(3): 198-201) estimated the loss from *S. invicta* feeding of about 65% of the yield of a field of hybrid corn in Stonewall, MS. The loss was estimated to be in excess of \$10,000. Lofgren and Adams (1981. *Florida Ent.* 64(1): 199-202) reported a reduction of 14.5% of the yield in fields of soybeans infested with *S. invicta* vs. non-infested fields. Their study covered 8 paired fields representing 2 counties in Georgia and one in North Carolina.

In late July, 1982, Mr. Ralph Brown, Florida Department of Agriculture and Consumer Services, alerted the author to damage to a field of egg plant, *Solanum melongena*, attributed to *S. invicta*. The field, located in Marion County, Florida ca. 10 miles south of Fairfield on SR 225, consisted of ca. 12 ha of rich, well drained loamy sand of the Hague-Zuber Fellowship Association. The field was divided into 2 sections, each with a different planting date. Field No. 1 (ca. 4.0 ha) was planted 28 June, while field No. 2 (ca. 8.1 ha) was planted 12 July. *S. invicta* infestations were initially observed by the grower along the periphery of the fields shortly after planting, but were not considered significant. Concern was expressed, however, following a survey of field No. 2 when heavy infestations of RIFA were observed feeding on plants throughout the field.

Initial plant density counts were made on field No. 2 on 26 July when plants were 15-30 cm tall. Ants were active over most of the field and were attacking entire plants in many cases. Plant density was determined for 18 m of row in each of 20 rows, selecting each 10th row. The transect line for these counts was established to run from the southwest corner of the field northeasterly to the center of the field (row 90), thence southeasterly to the southeast corner of the field. Dead and/or missing plants were recorded (Table 1). The second plant density count (9 August) included the category, dwarfed/stunted. This category was added when the grower reported no yield from these plants. This transect was initiated at the northwest corner of the field and ran diagonally to the center of the field, thence northeasterly to the opposing corner. Theoretical plant density was 20 plants/station. Plant density counts were determined on field No. 1 as indicated above on 2 and 10 August. No further reduction in plant density was noted at the last count, therefore we must consider that damage occurred during the early growth stages.

Heavy attacks of *S. invicta* workers were observed on plants in all sections of the fields with ants depositing tumulus on the growth tips and in the leaf axils of many plants. Heavy scar tissue on leaves and stems was noted, apparently from the feeding of the ants. Ants were also observed actively feeding on tender new growth and, on numerous occasions, were seen girdling the stems (Plate 1 & 2).

TABLE 1. MEAN PLANT DENSITY OF 20 STATIONS (18 M OF ROW EA.) OF EGG PLANT *Solanum melongena*, INFESTED WITH THE RED IMPORTED FIRE ANT, *Solenopsis invicta* BUREN, MARION COUNTY, FL 1982.

Survey date	Avg. no of plants dead or missing	Avg. no of plants dwarfed or stunted	Percent of plants lost to harvest
Field No. 1			
2/VIII	6.70	3.20	49.5
10/VIII	6.70	3.15	49.3
Field No. 2			
26/VII	8.25	—	41.3 ¹
9/VIII	8.7	4.15	64.3

¹Plants not sufficiently mature to detect dwarfism.

Surveys for other potentially damaging insect fauna were made concurrently with the plant density counts and revealed no other plant pests.

Egg plant production normally extends throughout the summer (14-16 weeks). The grower anticipated a yield of 1000 bu/acre for the season, but indicated that he expected a 50% reduction in yield. This expectation was supported by our plant density counts which showed a mean

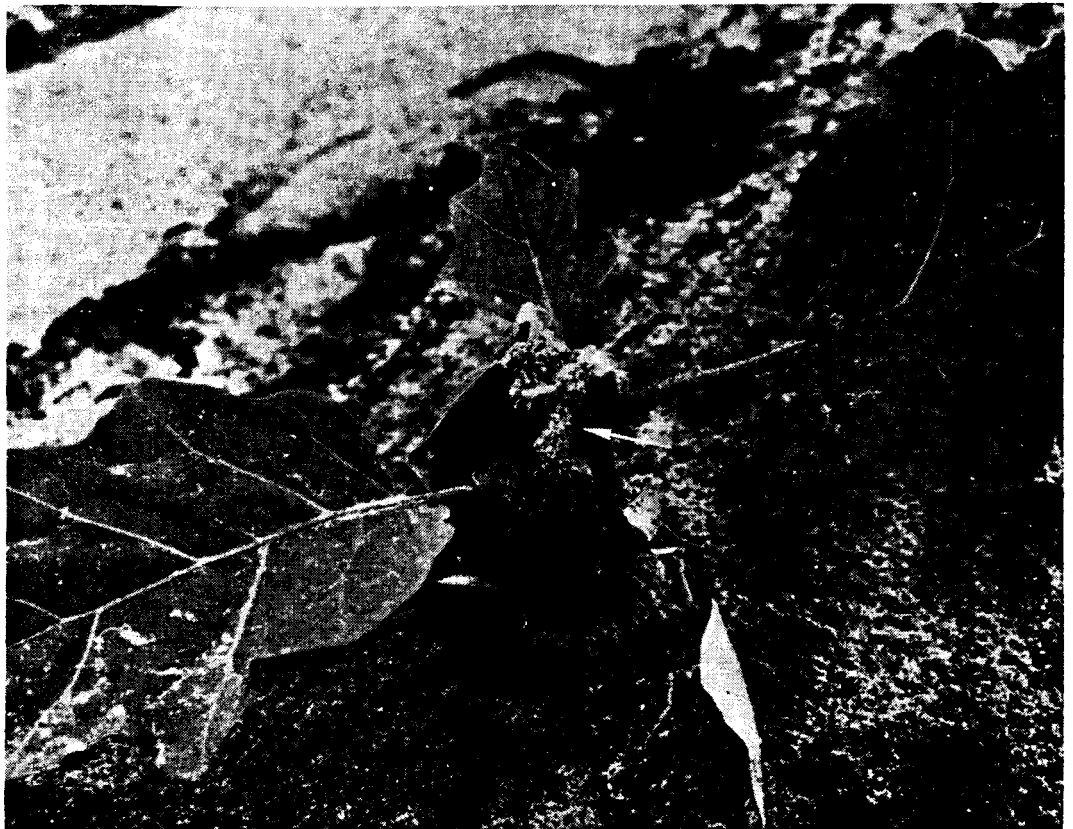


Fig. 1. Egg plant, *Solanum melongena*, indicating tumulus deposited at growth tip of young plant by *S. invicta*.

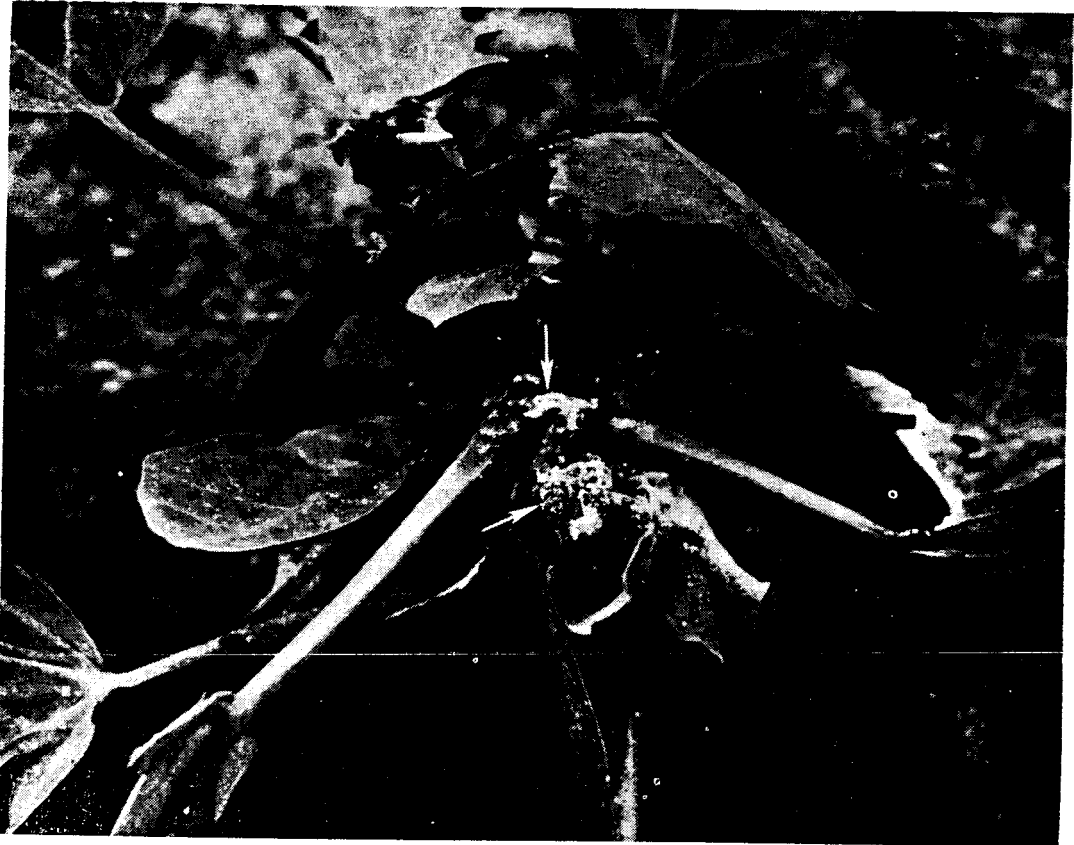


Fig. 2. Young plant indicating damage to growth tip and tumulus deposited in leaf axil by *S. invicta*.

plant reduction of 57%. Data furnished by the Vegetable Crops Department, IFAS, University of Florida, further indicate that under "normal-average" growing conditions one could expect a 5-10% plant reduction (Personal Communication), thus, the loss of 50% of the potential yield appears realistic. Assuming the wholesale value by the buyer and the grower's estimate of 37,000 kg/ha were correct, the RIFA damage to the crop represents a potential loss of \$90,000. However, because these figures were based on grower/buyer estimates we also reviewed the data on the basis of information from the Florida Crop and Livestock Reporting Service, Orlando, FL. They reported that the average statewide yield for eggplant in 1982 was 24,342 kg/ha with an average wholesale value of \$0.38/kg. Based on these data, the yield of eggplants would have been 292,104 kg with a potential value of \$110,999. If one-half of the crop was lost to RIFA, the farmer would have suffered a potential loss of \$55,500.—C. T. ADAMS, Agricultural Research Service, U.S. Dept. of Agriculture, Gainesville, FL 32604 USA.