REDUCED EFFECTIVENESS OF B.T. COTTON FOLLOWING DISRUPTION OF BENEFICIALS WITH EARLY SEASON INSECTICIDES

S. G. Turnipseed and M. J. Sullivan
Professors Entomology
Clemson University
Edisto Research and Education Center
Blackville, SC

Abstract

Economic infestations of both bollworm (Helicoverpa zea) and fall armyworm (Spodoptera frugiperda) developed in South Carolina during late July 1996 in each of 3 large (5A) plots of B.t. cotton (NuCotn 33b) that were treated with high rates of acephate (0.75 lbs active) on June 24 and July 2 to disrupt beneficials. Adjacent plots of similar size that were not treated exhibited no economic infestations of either pest in any of the 3 on-farm fields. Populations of geocorids and ants were decimated in acephate-treated plots and did not recover to effective levels by mid-August. Other beneficials exhibited varying degrees of mortality. After the second application, spiders were reduced to one-third of levels in untreated plots, but tended to recover better than most predacious arthropods. Acephate treatments in each field caused substantial aphid "flare-ups", which were accompanied by similar increases in coccinellid populations in treated plots. In separate observations, exceptionally high populations of large bollworms (1/plant) and fall armyworms (1/meter of row) were recorded in early August in several fields of NuCotn 33b that were not treated for bollworm and were in an area sprayed 4 or more times in early-season with malathion under the Boll Weevil Eradication Program. Our data confirm that applications of broad spectrum insecticides in early to mid-season can compromise the effectiveness of B.t. cotton by disrupting populations of beneficials. Such applications should be avoided if possible and B.t. cotton should be managed carefully for insect pests.

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