COTTON APHID INSECTICIDE CONTROL CONSIDERATIONS

Phillip Roberts, Department of Entomology, University of Georgia, Tifton

Introduction

Cotton aphid is an annual insect pest which builds to high numbers in most Georgia cotton fields. A naturally occurring fungus, *Neozygites fresenii*, annually infects aphid populations and causes populations to crash in late June or early July. Aphids feed on plant sap, removing moisture and nutrients and are often considered a stress inducing pests.

Aphid populations were unusually long lived during 2006. The naturally occurring fungus was observed in southernmost Georgia during late June but was much slower to spread than in recent years. Perhaps the slow development of the fungus was related to low relative humidity experienced during the hot and dry conditions of June and early July. The prolonged aphid infestations have renewed interest in aphid management. Reported in this paper are results of an aphid insecticide efficacy trial conducted during 2006 and a summary of available yield data for trials which included aphid treated and untreated plots from 1998-2005.

Methods

A field trial was established on the Coastal Plain Experiment Station in Tift county Georgia to evaluate the efficacy of recommended insecticides for aphid control. Plots were 6 feet wide and 40 feet in length and arranged in a randomized complete block design with four replications. Insecticide treatments (Table 1) were applied on July 3, 2006 with a CO2 backpack sprayer calibrated to deliver 16 gpa. Aphid populations were evaluated 2, 4, 7, and 14 days after treatment (DAT) by selecting the 3rd expanded leaf below the terminal from ten randomly selected plants in each plot. The leaves were returned to the laboratory and the aphids were counted on the left half of each leaf. Data were subjected to an analysis of variance and treatment means were separated using LSD (P=0.05).

Yield and aphid population data were summarized from 23 trials conducted during 1998-2005 which included aphid treated and untreated plots. Treated plots were sprayed 1-4 times with various aphid insecticides all of which provided good control of aphids. Trial means were used as replicates and a t-test was used to compare means. The 23 trials were also segregated into categories of low to moderate aphid infestations (< 75/leaf) and high infestations (> 75/leaf) and t-test were performed on each.

Results

Aphid populations were high and long lived in this trial; populations did not crash due to the naturally occurring fungus until after July 17 (14 DAT). This allowed us to examine residual control of the various insecticides. All recommended aphid insecticides significantly reduced aphid populations at 2, 4, and 7 days after treatment compared with the untreated (Table 1). Aphid populations were significantly greater in the Carbine treatment at 2 DAT compared with other insecticides due its slower mode of action. At 4 DAT, Assail and Centric provided the greatest reduction in aphid populations and were statistically similar with Bidrin and Carbine. At 7 DAT Assail and Carbine provided the greatest reduction in aphid populations. At 14 DAT Assail, Centric, and Carbine significantly reduced aphid populations compared with the untreated. Populations were building in the Bidrin and Trimax plots at 14 DAT and were not significantly different than the untreated. In summary all treatments provided acceptable control of aphids up to 7 DAT. Assail, Centric, and Carbine tended to provide longer residual control of aphids compared with Trimax and Bidrin.

Table 1. Aphid populations 2, 4, 7, and 14 days after treatment following application of recommended aphid insecticides on July 3, 2006, Coastal Plain Experiment Station, Tift county GA 2006.

		Aphids per ½ Leaf (3rd expanded leaf below terminal)			
Treatment	Rate per Acre	2 DAT	4 DAT	7 DAT	14 DAT
Untreated	-	202 a	154 a	145 a	154 a
Assail 70 WP	0.6 ozs	29 c	34 c	37 c	39 c
Bidrin 8E	6 ozs	29 c	44 bc	60 bc	112 ab
Centric 40 WG	1.25 ozs	45 c	35 c	53 bc	66 bc
Trimax Pro	1.5 ozs	43 c	74 b	83 b	116 ab
Carbine 50 WG	1.4 ozs	73 b	50 bc	43 c	70 bc

Means followed by the same letter do not significantly differ (P=0.05).

As demonstrated in the 2006 aphid efficacy trial, insecticides are commercially available which will provide good control of aphids. However, questions still remain as to when and if insecticide treatment is economically justified. Since 1998, 23 field trials have been conducted in Georgia examining the impact of cotton aphid on yield. Mean yields were similar (prob t=0.38) in untreated plots compared with aphid treated plots, 1090 lbs and 1094 lbs lint/acre respectively. Of the 23 trials, aphid populations were low to moderate (< 75/leaf) in nine locations. In low to moderate aphid environments yields were not significantly different (prob t=0.20) but tended to be lower where insecticides were used; untreated 1120 lbs lint/are and treated 1071 lbs lint/acre. Fourteen trials were conducted in high aphid environments (> 75/leaf) and yields were significantly increased (prob t=0.01) in treated compared with untreated plots. Untreated yields were 1094 lbs lint/acre compared with 1131 lbs lint/acre in treated plots.

Cotton appears to have the ability to endure and maintain yield potential under low to moderate aphid infestations as yields were not significantly improved in treated plots. A

small but statistically significant, 37 lbs lint/acre, increase in yield was observed in environments where aphids exceeded 75 per leaf in untreated plots. Additional research is needed to determine when and if control of aphids is economically warranted.