

**EFFECTS OF CONSERVATION TILLAGE
SYSTEMS ON COTTON APHID POPULATIONS**
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Abstract

Studies to monitor cotton aphid, *Aphis gossypii* Glover, populations in conservation tillage production were conducted at the LSU Agricultural Center's Macon Ridge Research Station located near Winnsboro, Louisiana during the six year period, 1994-1999. Tillage treatments that were used in these studies included conventional and reduced tillage (\pm winter wheat cover crop) systems. Cotton aphid populations were monitored weekly from one week after cotton seedling emergence to crop termination by sampling ten whole plants or plant terminals (all apical shoot growth above and including the first fully expanded leaf) from each plot.

Cotton aphid peak densities exceeded 1000 insects/sample during all years except 1996 and 1997. The seasonal increase in cotton aphid density occurred during early June and was similar to that observed during all years. Significantly higher densities of cotton aphids were observed in no-tillage plots compared to that in conventional tillage plots during 1994, 1995, 1996, 1997, and 1998 ($P < 0.01$). There were no significant differences in cotton aphid densities between native vegetation and winter wheat cover crop plots, regardless of tillage system. In all years except 1999, the most important agronomic factor influencing cotton aphid populations appeared to be a reduction in tillage practices. During each year of the study, populations declined abruptly in July because of an epizootic from an insect pathogenic fungus, *Neozygites fresenii* Nowakowski. Populations were low for the remainder of the season. The spatial and temporal occurrence of this fungus was not influenced by tillage practices or the winter wheat cover crop. Red imported fire ant (RIFA), *Solenopsis wagneri* Santschi, densities were surveyed in this test during 1998 and 1999 and were found to be higher in the no-tillage plots compared to that in the conventional tillage plots. The highest numbers of cotton aphids were generally recorded in those plots infested with RIFA. RIFA colonize no-tillage plots and appear to reduce predation of cotton aphids from natural enemies.