A SOUTHEASTERN PERSPECTIVE ON HEMIPTERAN PESTS

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Abstract

In 2005-2007, Cotton Incorporated supported a southeastern research initiative entitled *"Identifying Practical Solutions for Managing the Sucking-Bug Complex in Cotton: Research in the SE Region"* through the State Support Committees of Virginia, North Carolina, South Carolina, Georgia and Florida. The main focus of this research was to develop and refine scouting procedures and thresholds in managing this increasingly damaging bug complex in southeastern cotton. Studies included 1) determining wild and cultivated host utilization and bug movement through the agricultural landscape, 2) evaluating the utility of employing an external boll damage assessment scouting procedure, 3) determining the relative economic impact of plant bugs vs. stink bugs in the Southeast, 4) determining the major stink bug species impacting cotton by sub region, 5) establishing the relationship between cotton phenology and susceptibility to bug damage to boll damage and yield loss, 6) the possible utility of a dynamic, phenology-based, internal boll damage vs. static thresholds of 10, 20, and 30% under differing cotton crop

conditions and bug pressure, 7) determining the relationship between stink bug damage to bolls and impact on yield and quality, and other studies.
In North Carolina, although a path of green and brown stink bugs through wheat and corn into cotton was established, based on light trap counts for green stink bugs, pheromone trapping for brown stink bugs and live bug assessments via sweepings and plant examinations, no predictive capability between wild and cultivated host suitability and the potential bug damage threat to cotton was found during the susceptibility period for cotton (approximately weeks 2 to 6 of the bloom period). However, in Georgia, evidence suggests that in years of moderate to heavy pest pressure (i.e. 2005), the southern green stink bug common to that area may be more damaging to cotton nearby or adjacent to peanuts. In a series of 14 replicated tests conducted in 2005 and 2006, plant bugs were found to be at low enough levels to be considered a non- or minimal pests to bolls at the test sites, based upon low levels of "dirty blooms", high square retention counts during the first 5 weeks of the bloom period, and low levels of adult and immature plant bugs assessed via ground cloths. These findings do not exclude the occasional moderate to high damage sometimes caused by tarnished plant bugs in selected situations in our region.

Sixteen replicated "progressive spray tests", in which a treatment was phased in every week (and subsequently that plot was protect throughout the season) from the initial week of bloom until cutout suggested that 1) boll protection with insecticides during the initial 2 weeks of blooming had no impact in yield, 2) boll protection during weeks 3-5 of bloom resulted in a positive yield gain, and 3) boll protection after weeks 5 or 6 had no or little impact on yields. This finding was in part the basis for evaluating a "dynamic threshold" which was set higher during periods of a low probability of yield loss (early and late in the bloom period) and lower during the bloom period of high susceptibility of boll damage and subsequent yield loss.

A large number of threshold tests were conducted from 2005 to 2007 (18 in 2007) to evaluate various internal damaged boll thresholds. A dynamic threshold was included in the 2006 and 2007 tests. Results to date suggest that while a static 20% threshold lost yield compared to weekly insecticide sprays during high stink bug pressure (2005 tests), the 10% static threshold resulted in economic losses do to unneeded sprays in low bug pressure situations (2007 tests). A dynamic threshold of 50, 30, 10, 10, 10, 10, 30 and 50% internal boll damage (the dynamic threshold refers to weeks one through 8 of blooming) provided economic returns similar to the 20% static threshold during light stink bug pressure (2007) and offered the best returns during higher stink bug pressure (2006). Additional threshold testing is planned for 2008.

In addition to evaluating the dynamic and various static thresholds, a number of test sites were established in NC and VA in 2006 and 2007 to evaluate the relationship between external damage to bolls, various kinds (warts and lint staining) and amounts (minor and major) of internal boll damage, yield and quality. Results to date suggest that while the correlation between an individual boll with external and internal damage is low (though positive), the relationship between external and internal damage approaches 90% if one assesses a series of bolls and considers the total number of external bug-caused sunken lesions. Contingent upon the success of 2008 submitted grant proposals, present plans include continuing this work through a post doctoral position with Dr. Ames Herbert at VA Tech.