

Report of 2005 Research Results  
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Project Title: Evaluation of New Novel Insecticides and Genetically Altered Varieties to Determine Where They Best Fit in the Alabama Cotton Pest Management System

A total of seventeen tests were conducted under the above project title in 2005. More than one hundred pages of data tables were generated. These tests could be categorized as follows: Early season insect (thrips) control (4 trials); aphid control with new selective chemistry (1 trial); lepidopterous (caterpillar) control (4 trials); genetically altered varieties (Bollgard II, WideStrike, Vipcot) (2 trials); plant bug/stink bug (4 trials concerning controls, 2 trials involving thresholds and sampling techniques).

A description of these trials and summary of more significant findings are presented as follows. Complete reports, including all data and conclusions, are available from Ron Smith, 206 Extension Hall, Auburn University, AL 36849.

I. Early Season Insect (Thrips) Trials

- Test #1. Cruiser, Temik and Gaucho Grande were compared, without foliar oversprays, and with two timely oversprays of Orthene versus pyrethroids. An untreated at-planting was also included to measure the benefit of foliar oversprays alone. All at-planting treatments were effective compared to the untreated. For the second consecutive year, Gaucho was slightly superior to either Temik or Cruiser when no nematodes were present. Foliar sprays alone do not prevent severe thrips injury on April planted cotton. Orthene and pyrethroids were similar in effectiveness as a foliar overspray for thrips.
- Test #2 Various combinations of the products (fungicide, insecticide) that will be available on the Avicta treated seed in 2006 were evaluated. The Avicta seed treatment was visibly better than Cruiser alone for thrips control (no nematodes present).
- Test #3 A new experimental compound (KC791230), similar to Temik, was evaluated at several sites. In all instances it appeared to perform equal to Temik.
- Test #4 One thrips test was conducted with Roundup Ready Flex seed. Various foliar thrips treatments were added to the RR oversprays in the early season window. In all instances, thrips oversprays added automatically to the RR, improved the early season vigor and reduced the thrips stunting with no negative side effects.

II. Aphid Control

One test was conducted with the new selective chemistry (Intruder, Centric and Trimax) at various rates, with and without crop oil concentrates, for aphid control.

Intruder and Centric were slightly superior to Trimax. Intruder rates may be reduced, with the addition of a crop oil, and still obtain excellent aphid control.

### III. Caterpillar Trials

- Test #1 Curacron alone and in combination with various pyrethroids was evaluated against the bollworm species. (Note: the bollworm is now showing some levels of resistance to the pyrethroid chemistry which has been the primary control tool for the past 30 years). In this trial, Curacron did not improve the performance of pyrethroids when used either as a tank mix partner or alone.
- Test #2 The efficacy of S-1812 (Valent new chemistry) in combination with various pyrethroids was compared to a combination of S-1812 and Orthene. All treatments were similar in this test, conducted against primarily the bollworm species.
- Test #3 A new Heliothine (worm) insecticide from Dupont, DPX-E2Y45, was evaluated at Prattville, AL for the third consecutive year under secrecy agreement. Secrecy was removed in December 2005 so results can now be discussed. This product is highly effective and gives the longest residual control of any product evaluated since the early days of the pyrethroid chemistry. Ten to fourteen day residual control was obtained against the bollworm species. One application of this product may give effective worm control per generation of caterpillars during a cotton fruiting season.
- Test #4 Steward and KN128 (new formulation of Steward from Dupont) were evaluated at various rates and compared to other novel chemistry for soybean looper control on cotton. Both Steward and KN128 were more active than any other chemistry (Intrepid, Diamond, S-1812) for looper control, even at reduced rates. Steward and KN128 showed similar activity at all rates tested.

### IV. Genetically Altered Trials

- Test #1 PhytoGen varieties containing the WideStrike technology with the Roundup Ready and/or Roundup Ready Flex gene were evaluated at the Wiregrass Research Center. PHY440W, PHY470WR, PHY475WRF and PHY410R were included and evaluated for worm control both with and without worm oversprays. The WideStrike gene continues to give good suppression of bollworms and excellent control of tobacco budworms and soybean loopers. Under heavy bollworm pressure, supplemental foliar sprays may be necessary to prevent square damage to WideStrike varieties. However, little to no boll damage to bollworms has ever been recorded, even in the absence of foliar sprays. Varieties with the RR Flex gene yielded equal to or better than Roundup alone, WideStrike alone, or Roundup + WideStrike.
- Test #2 Various lines of VipCot technology were grown at the Wiregrass Research Center. However, due to overwinter seed reproduction delays in Hawaii,

the seed were not available for planting until June 20. This resulted in a lack of caterpillar pressure throughout the season and no meaningful data was obtained.

## V. Plant Bug/Stink Bug Trials

- Test #1 Ten treatments, including Trimax, Trimax Pro, Centric, Diamond, Bidrin and combinations of Diamond+Bidrin and Bidrin+Discipline (pyrethroid) were evaluated. Diamond is a new insect growth regulator (IGR), produced by the Chemtura Chemical Co., which has long residual and activity on the immature stage of bugs. Most treatments gave good control under the low insect pressure encountered in this test. Trimax was the weakest treatment and Trimax Pro (new formulation-higher rate) was no more effective than the currently available formulation.
- Test #2 This test was conducted later into the season in the stink bug window with 16 treatments. Some were the same chemicals as evaluated earlier in the plant bug trial. Additions were Orthene and Leverage. Trimax, Trimax Pro and Orthene, at the 0.5 lb. rate, did not give acceptable control of green stink bugs. However, back-to-back applications of Orthene at 0.5 lb or the higher rate of 0.75 lb. gave good control. Bidrin, Leverage, Discipline, and Diamond, plus combinations of these products, all gave good control of stink bugs.
- Test #3 A late season stink bug trial with higher pressure was conducted with most of the same treatments as the previous test. Trimax and Trimax Pro were not included. All treatments gave excellent control after 2 days post treatment when compared to the untreated control. This level of control held stink bugs in check for two plus weeks (August 23 to September 6). Centric, Bidrin, Diamond, Leverage, Discipline, Orthene and various combinations of these products were effective.
- Test #4 New pyrethroid formulations from FMC Corp. were compared to Karate for stink bug control in this test at the Wiregrass Research Center. Both F2700-04-01 and F0570 were as effective as Karate as all provided excellent control and gave good residual activity under heavy stink bug pressure.
- Test #5 This test was conducted against a heavy population of the more difficult to control brown stink bug species. Chemicals evaluated were Karate, Centric, Leverage, Karate+Zephyr, Centric+Zephyr and Bidrin. Most of the brown stink bugs were in the immature stages. Bidrin, a phosphate insecticide, was the only treatment that gave acceptable control of the brown stink bug. Evaluations were made at the 3 and 7 day post treatment interval.
- Test #6 Late season insect (stink bug) management in Bollgard IIRR cotton. Test was conducted in large blocks (2 acres), replicated, with various triggers for stink bug applications. Treatment #1 was automatic controls at the 3, 5 and 7 week post bloom; treatment #2 was based on the pressure/absence of stink bugs at 3 weeks post bloom, followed by automatic applications at

the 5<sup>th</sup> and 7<sup>th</sup> week intervals; treatment #3 was to follow University thresholds at 20% boll damage; treatment #4 was untreated season long. Actual treatments made ranged from none to a high of three. Seasonal averages of stink bug damaged bolls was highest in the untreated. This damage was about 50% greater than where three treatments were made. Correspondingly, stink bugs were also highest in the untreated and lowest in the treatments with three insecticide applications. Yields were improved by about 12-15% where stink bugs were treated as compared to the untreated. This test demonstrated that a significant level of stink bug boll damage may occur with seemingly low levels of stink bugs present. Treatment decisions based on the number of stink bugs found visually or on drop cloth surveys are a poor decision making tool for applying stink bug controls. Yield losses from subeconomic levels of stink bug damage are significant when this damage occurs over several weeks of the boll-set season.

Test #7 A stink bug threshold test was conducted at the Wiregrass Research Center as part of a Multi-State Cotton Incorporated Project. Eight rows of BGII cotton was planted through the center of a peanut field to insure a good supply of stink bugs. Three treatments were replicated four times. These treatments were: untreated, University threshold (20% boll damage) and stink bug free. Weekly counts were made both by drop cloth and collecting 10-12 day old bolls for a measure of internal damage. Between July 19, when the first 10-12 day old bolls were present, and September 6, when the youngest bolls were more than 25 days old, a total of 5 applications were made to the University threshold plots while 7 applications were made to the bug-free plots. Numerous points were gained from this test, which would be similar to the border of any cotton field in the coastal plains of the S.E. that bordered or interfaced with peanuts. Up to 10% boll damage occurred before stink bugs could be detected by the drop cloth survey method. Stink bug movement from peanuts to cotton occurs throughout the boll-set season. It was near impossible to reduce either stink bugs or their damage with short residual insecticides, under these conditions of this test. Damage to the untreated plots were so extensive that it was difficult to find 10-12 day old bolls to sample. A total of five insecticide applications were made to the University threshold plots while seven applications were made to the stink bug free plots. Yields were taken and seed cotton samples will be ginned for lint quality measurements. Yields obtained were 300 lbs. of lint for the untreated; 1320 lbs. for the University thresholds (5 applications); and, 1460 lbs. for the stink bug free plots (7 applications). In this test, it would have been more profitable for growers to utilize a stink bug free threshold. Data and yields from this test indicate that field borders of cotton, adjacent to peanuts, may require or benefit from more applications than are needed for the entire field.

