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NATIONAL PEANUT BOARD/SOUTHEAST PEANUT
RESEARCH INITIATIVE FINAL PROGRESS REPORT
FOR WORK DONE UNDER RESEARCH AGREEMENT: #032493-01

DATE: July 23, 2007

INSTITUTION: University of Georgia, Tifton Campus

PROJECT TITLE: **Combination of Pest Resistant Cultivars and Advanced Breeding lines with Systemic and Foliar Insecticide for Control of Leafhopper and Three-Cornered Alfalfa Hopper in Peanut**

RESEARCH AGREEMENT NO.: 25-21-RF330-378

PROJECT LEADER: Dr. James W. Todd

EXPIRATION DATE: June 30, 2007

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NPB Control No.: 032493-01

FINAL REPORT OF PROGRESS:

Resistance to potato leaf hopper, *Empoasca fabae*, and three-cornered alfalfa hopper, *Spissitilus festinus*, has been investigated at Tifton and Attapulcus, Georgia and Marianna, Florida and Headland, Alabama. A scale for visual ratings of "hopper burn" (leaf yellowing due to feeding of hopper nymphs and adults) similar to the "Florida Scale" for leaf spot ratings was developed and used in these studies. Several very susceptible cultivars have been characterized, with the most heavily damaged being 'AP 3', 'DP 1', and 'Andru II'. Additionally, 'Georgia Green', 'Carver', and 'Georgia 02C' were only slightly less damaged than the most susceptible cultivars. New releases, 'Georgia 03L', 'Georgia 05E', 'Florida 7', 'McLeod', and 'York' were found to be intermediate in susceptibility also. 'Georgia 01R' had significantly less "hopper burn" as well as lower populations of leafhopper nymphs and adults. 'Bayo Grande', a Bolivian landrace cultivar had significantly fewer girdles due to feeding of the three-cornered alfalfa hopper, and lower populations of adults and nymphs. Conversely, 'AP3', was among the most heavily damaged cultivars due to feeding by nymphs and adults. Since Georgia 01R was

consistently among the least damaged cultivars, it was used as a standard for comparison to advanced breeding lines from the Pittman and Todd project under the Peanut Collaborative Research Support Program with Florida/Georgia/Bolivia. CRSP lines which offer resistance levels at least comparable or better than that found in GA 01R, are #s 648,670,702, 886,895, 906, 910, 911, 912, and 925. Tests at Tifton and Attapulgus, GA, and Marianna, FL to evaluate combinations of resistant and susceptible cultivars with certain at-plant systemic insecticides and foliar sparys showed excellent yields on Georgia 01R, Florida 7, and AP3 where Thimet® insecticide and Karate® foliar sprays were used. Conversely, the yields of Georgia Green were reduced approximately 50% compared to those of the most resistant cultivars regardless of the insecticide treatments used. Treatments need to be initiated by the early pegging stage if leafhopper nymphs are present, and also to prevent extensive girdling due to three cornered alfalfa hopper on small plants. Economic injury levels are yet to be determined however, and this should be a high priority for future projects. Finally, experiments to quantify the effects of irrigation treatments on damage by these two insects at the Stripling Irrigation Park were inconclusive due to extremely light populations and damage levels. Future work on this aspect of production should also be investigated further.