

Georgia Cotton Report 2009

A state record yield of 882 lbs. of lint per acre was harvested from 990,000 acres during 2009; farm gate value from lint and seed sales is expected to exceed 600 million dollars for Georgia cotton producers. Cotton is an intensively managed crop and requires management of pests in multiple disciplines (entomology, plant pathology, and weed science). Cotton producers also encounter production and pest management issues which require investigation by multidisciplinary teams such as the University of Georgia Cotton Team. Development, implementation, and refinement of Integrated Pest Management (IPM) programs are essential for promoting environmental stewardship and sustaining profitability of the Georgia cotton industry.

Entomology: Elimination of the boll weevil and the use of transgenic Bt cottons have allowed growers to truly employ IPM, utilizing natural and cultural controls, thresholds, and insecticides on an as needed basis. Prior to these events, it was not uncommon for insecticide applications to average 12-15 per year. Insecticide use averaged approximately 3 applications per acre during 2009. In the relatively low insecticide use environment, stink bugs have elevated in pest status and much of our efforts have focused on improving the management of the boll feeding bug complex. An Extension publication summarizing a multi-state project addressing stink bug management in cotton was published and distributed to growers in Georgia and the southeast. Through cooperative efforts with USDA-ARS scientists, progress continues to be made to better understand the relationship between stink bugs and boll rot pathogens. Thrips are also an important pest and proper management is critical in IPM programs. Efforts were initiated to better define the susceptible stages of cotton seedlings to thrips injury. Thrips injury is easily observed but is often cosmetic once plants reach the 4-5 leaf stage, having little to no impact on yield. Foliar insecticide applications for thrips increase the risk of secondary pests such as spider mites which have become an important pest of cotton in the Mid-South. Insecticides remain a vital component of IPM programs. Efforts to better define insecticide efficacy and appropriate use patterns for current and novel pesticides, 2-gene transgenic Bt cottons, and susceptibility monitoring for corn earworm and stink bugs to available insecticide chemistries also continue.

Plant Pathology: Applied research and education programs related to plant pathology include foliar diseases, nematodes, and seedling diseases. A complex of foliar disease pathogens can be observed on Georgia cotton. Most foliar diseases are related to potassium deficiency and proper fertility programs minimize the risk and potential yield impact associated with infection. However, a new foliar disease, *Corynespora cassiicol*, was identified in Georgia during 2009 which is not influenced by plant potassium levels. Effective fungicides are available; however applied research and demonstration trials have not demonstrated a consistent yield response. Nematodes are an important pest of Georgia cotton, infesting over 70 percent of the acres planted. During recent years efforts have included defining risk management zones which will allow the use of precision application of nematicides which will decrease nematicide use allowing for increased profits for growers and better environmental stewardship. Also during recent years, the potential interaction between early season thrips and nematodes has been investigated.

Rapid early season root growth is a goal for nematode management programs. Excessive thrips injury early season has a significant effect on root growth and thus proper management of thrips is an important part of a nematode management program. Seedling diseases can be a devastating pest if not managed. In Georgia planting when soil temperatures are conducive for rapid emergence and growth minimize the risk of seedling disease and the need of supplemental fungicides at planting.

Weed Science: Glyphosate resistant *Palmer amaranth* is a serious pest of cotton and other row crops produced in Georgia. Glyphosate resistant *P. amaranth* populations have rapidly spread in Georgia and have been confirmed in most production areas. Rather than relying on herbicides alone, research and education efforts for *P. amaranth* are focusing on a more integrated approach which includes the use of tillage, high residue cover crops, multiple herbicide chemistries, and hand weeding. *Palmer amaranth* has tremendous reproductive potential (producing about 400,000 seeds per plant) and managing the “seed bank” is key for cotton production. Research investigating seed germination suggests that burying seed or minimizing light penetration to the soil surface significantly reduces germination. Seed viability studies suggest significant “seed mortality over time and aggressive hand weeding will further reduce the seed bank”. During 2009, we observed high numbers of beet armyworms infesting *P. amaranth* in four cotton producing counties. Once the weeds were defoliated, mid-late instar beet armyworm larvae migrated to cotton. Bt transgenic cottons will not provide control of late instars and excessive damage was observed in some fields.

Refereed Publications (Roberts and Kemerait only):

Toews, M., E. Blinka, J. Van Duyn, A. Herbert, J. Bacheler, P. Roberts, and J. Greene. 2009. Fidelity of external boll feeding lesions to internal damage for assessing stink bug damage in cotton. *J. Econ. Entomol.* 102(3):1344-1351.

Medrano, E.G., J. Esquivel, A. Bell, J. Greene, P. Roberts, J. Bacheler, J. Marois, D. Wright, R. Nichols, and J. Lopez. 2009. Potential for *Nezara viridula* (Hemiptera: Pentatomidae) to transmit bacterial and fungal pathogens into cotton bolls. *J. Current Microbiology* 59:405-412.

Culpepper, S., A. York, P. Roberts, and J. Whitaker. 2009. WideStrike 485 WRF cotton and glyphosate-resistant Palmer amaranth response to glufosinate in Georgia. *Weed Tech.*, 23:356-362.

Extension Publications:

Herbert, A., E. Blinka, J. Bacheler, J. Van Duyn, J. Greene, M. Toews, P. Roberts, and R. Smith. 2009. Managing stink bugs in cotton: research in the southeast region. Publication 444-390, Virginia Polytechnic Institute and State University. Found online at <http://pubs.ext.vt.edu/444/444-390/444-390.html>.

Guillebeau, P. (editor). 2009 Georgia Pest Management Handbook Commercial Edition. The Univ. of Georgia Coop. Ext. Ser. Special Bull. 28, 863 pp. Found online at <http://www.ent.uga.edu/pmh>.

Roberts, Phillip (Ed.), Stanley Culpepper, Glen Harris, Bob Kemerait, Don Shurley, and A. Smith. 2009 Georgia Cotton Production Guide. The Univ. of Georgia Coop. Ext. Ser., ENT 09-01. Found online at <http://ugacotton.com>.

Cotton Team, 2009. Georgia cotton newsletter, The Univ. of Georgia Coop. Ext. Ser., 9 issues. Found online at <http://ugacotton.com>.

Roberts, P.M. 2009. Cotton pest management newsletter. The Univ. of Georgia Coop. Ext. Ser., Entomology 09-PMR(1), 11 issues. Found online at <http://ugacotton.com>.

Toews, M, G. Ritchie, and A. Smith. 2009. Cotton Research-Extension Report 2008. UGA/CPES Research – Extension Publication No. 6. Found online at <http://ugacotton.com>.

Meetings:

The county delivery model is an effective means of communicating educational programs to grower and industry clientele. Preparing county agents is an on-going process and includes formal training and periodic updates through newsletters and correspondence. 55 county agents were provided in-depth training on cotton production and pest management principles and practices during 2009.

Members of the UGA Extension Cotton Team presented educational programs at 68 local or county cotton production meetings which were organized by county agents. In addition to the educational opportunity, these meetings allow our stakeholders to express needs or issues which aid in program planning so that our efforts remain relevant and address the true needs of our clientele. The Extension entomologist participated in 40 meetings which had an average attendance of 34 growers and agricultural industry representatives.

We annually participate in a statewide meeting, the Georgia Cotton Conference, which was attended by 210 persons during 2009. In addition to policy and marketing talks, Cotton Team members conducted concurrent sessions to specifically address production and pest management programs for respective disciplines.

Field Days:

Sunbelt Agricultural Exposition Field Day, attendance @400

UGA Southwest Research and Education Center Field Day, attendance @150

Tifton Campus Cotton and Peanut Research Field Day, attendance @60

Cotton Scout Schools: 53 in attendance.

Cotton Insect Hotline (1-800-851-2847), three minute updates (8 updates during 2009)

Presentations (selected):

PIs also participated and presented multiple papers at state, regional, and national professional meetings.

Toews, M.D., E. Blinka, A. Herbert, J. Bacheler, S. Malone, J. Van Duyn, P.M. Roberts, J.K. Greene, and W.D. Shurley. 2009. Balancing sample size, accuracy, and time when monitoring stink bug damage. Beltwide Cotton Conf.

Roberts, Phillip, Mike Toews, and Bob Kemerait. 2009. Impact of early season thrips control on root development and nematode management. Beltwide Cotton Conf.

Roberts, Phillip, Mike Toews, Barry Freeman, Tim Reed, Ron Smith, Jack Bacheler, Ames Herbert, and Jeremy Greene. 2009. Spider mites – pest status, southeastern region. Beltwide Cotton Conf. Spider Mite Symposium.

Roberts, P., M. Toews, J. Ruberson, J. Greene, J. Bacheler, J. Van Duyn, E. Blinka, A. Herbert, and Ron Smith. 2009. Boll feeding bugs in the southeast: Where we have been and where are we going? Southeastern Branch Entomol. Soc. of America Annual Meeting: Managing Cotton Insects Symposium.

Woodward J.E., M.A. Newman, K.S. Lawrence, R.C. Kemerait, B. Padgett, P.M. Phipps, J. A. Wrather, G.L. Sciumbato, J.J. Marois. 2009 Foliar applications of fungicides in cotton: a summary of field trials across the cotton belt. Beltwide Cotton Conf.

Kemerait, R.C., F. H. Sanders, W.A. Mills, J. Clark, W. E. Harrison, D. E. McGriff, B. R. Mitchell, S. N. Brown. 2009. Assessment of fungicides to manage foliar diseases of cotton in Georgia 2004-2008. Beltwide Cotton Conf.