

# Georgia Entomological Society Arthropod Survey

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2017

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## **Apple**

Apple insect and mite IPM in GA has been and continues to be quite stable. Resistance problems with codling moth (*Cydia pomonella*) and Oriental fruit moth (*Grapholita molesta*), both key fruit-attacking pests, are evident but continue to be seen as slowly unfolding, farm-specific processes. In most GA apple orchards insecticide applications timed by temperature-driven developmental models still provide excellent control of codling moth, Oriental fruit moth, and tufted apple budmoth (*Platynota idaeusalis*) our key complex of fruit feeding lepidopterans. That said, significant GA apple acreage exhibits signs of resistance to phosmet (Imidan), methoxyfenozide (Intrepid) and/or novaluron (Rimon). Fortunately orchards experiencing declining insecticide performance have gotten good to excellent codling moth and Oriental fruit moth control with pheromonal mating disruption.

A potential new pest(s) for the region is a complex of ambrosia beetles (subfamily Scolytinae). These small beetles excavate tunnels in stressed trees and inoculate the bored-out galleries with a fungus. The resulting injury, fungal infection, and secondary infections can rapidly kill trees. Such injury was observed at a few north Georgia orchards in 2017, and incidence will be monitored in 2018. Management for these beetles is minimally effective and relies on trunk sprays with chlorpyrifos, painting trunks with diluted white latex paint, and/or removal of already infested trees, but keeping trees healthy and happy is really our best strategy.

The relatively new invasive brown marmorated stink bug (*Halyomorpha halys*) is readily observed in GA's mountain counties, but to date has not been a significant pest in northern apple or peach production.

## **Blueberry**

Spotted wing drosophila (SWD) remains the key pest of blueberries in Georgia. Although trap captures were similar to previous years, overall impact of SWD was less noticeable in 2017 because 70-80% of the blueberry blooms were killed due to frost events in March and the harvest was much smaller. However, in the frost protected blueberry fields, growers were able to proactively implement SWD management strategies recommended by UGA Blueberry Entomology program. Consequently, crop losses due to SWD infestations were very low and no major fruit rejections were reported at the packing lines. Overall, SWD management costs ranged from \$100-150 per acre.

Over the last couple of years, we have seen a significant increase in secondary pest problems likely due to multiple applications of broad-spectrum insecticides (OPs and pyrethroids) to control SWD. During 2017, gall midge, thrips, and scales were reported to be the major concerns. Other insect pests reported during 2017 included bud mites, cherry fruit worm, cranberry fruit worm, leafhoppers, bearberry whiteflies, and ground pearls. In 2017, chilli thrips were also detected for the very first time in Georgia blueberries; however, their economic impact remains to be determined. Statewide, a significant proportion of the blueberry acreage was treated with 1-3 insecticide applications to control these secondary insect pests.

More recently, frost events in March 2018 have caused some damage to blueberry blooms. The preliminary estimates indicate that Georgia blueberry growers may have lost about 30-40% of southern

highbush blueberry crop and 20-30% of rabbiteye blueberry crop. Of course, these are preliminary estimates and the actual impact of these frost events will be determined at harvest.

### **Corn**

Corn acreage in Georgia was 290,000 acres planted and 245,000 acres harvested which was less than 2016 due to lower grain prices and wet conditions at planting. Average grain yield was 178 bu/acre, which was greater than the year before, but many irrigated fields yielded 250-300 bu/acre. Average corn grain price received was \$4.15 per bushel. An additional 35,000 acres were harvested as silage with a yield of 16 tons per acre. All corn seed is treated with a neonicotinoid insecticide so soil insect damage was very low. Stink bug infestations were low to moderate in 2017 in most areas, although preventive sprays were still used widely. Fall armyworm populations were moderate but some whorl infestations were treated in southern GA. Fall armyworm whorl infestations were severe in non-Bt corn in later planting. Corn earworm infestations were low to moderate in on-time planted corn, but increased to damaging levels in late-planted corn. Bt corn adoption is about 80% in the state. Cost of Bt technology was about \$16 to \$28 per acre depending on trait package. More unexpected ear/kernel damage by corn earworm was observed in late planted Bt corn than a few years earlier suggesting that field-evolved resistance is occurring in some Bt trait products in Georgia. Studies in 2017 indicate resistance in corn earworm populations to the Cry1A genes is now widespread in the southern U.S.

### **Cotton**

The 2017 production year will be remembered as the year of the whitefly. Silverleaf whitefly infested the majority of cotton and reached outbreak populations in many areas. An average yield of 850 lbs. lint per acre was harvested on 1.27 million acres of cotton. Average insecticide applications were 3.9 per acre, average yield loss due to insects was 9.25 percent, and the total costs associated with insect pests (losses plus control costs) were \$167.93 per acre. Insect control costs and losses were the highest recorded in over 20 years.

Moderate thrips infestations were observed on cotton planted in April followed by unusually low thrips infestations on cotton planted in May and June. Due to low populations, neonic seed treatments provided acceptable control, and fewer foliar applications were made by growers.

Tarnished plant bugs infested 45 percent of Georgia cotton and 9 percent of the acres were treated. We continue to see a trend for increased numbers of tarnished plant bugs in cotton. Insecticide applications targeting plant bugs disrupt beneficial insects and have the potential to flare secondary pests. Approximately 5 percent of acres were treated for cotton aphid and spider mites respectively.

Nearly all cotton planted in Georgia is Bt cotton. There are concerns in Georgia and the Cotton Belt as a whole that we are observing decreased efficacy (resistance) of some Bt technologies to corn earworm in the field. Approximately 20 percent of cotton was treated for corn earworm. Stink bugs continue to be the most common insect requiring treatment. Approximately 80 percent of acres were treated for stink bugs; averaging 1.77 applications per acre.

The 2017 cotton production year will most be remembered by the major outbreak of silverleaf whitefly (SLWF). Initial infestations in cotton were observed in late May which was unusually early; historically if we see SLWF infesting cotton in July we anticipate economic problems. The earliest insecticide applications for SLWF were made in early July. SLWF typically is a localized pest, infesting up to 20 percent of cotton acreage. During 2017 approximately 85 percent of cotton was infested with SLWF and 70 percent of the acreage was treated. Total SLWF insecticide applications averaged 1.33 per acre. Due to the specificity and limited use of most SLWF insecticides, cotton quickly exhausted supplies of preferred insecticides. Finding and applying insecticides for SLWF in a timely manner was difficult during August and September. Control costs averaged over \$23 per acre and yield loss was estimated at 7.65 percent per acre. In total, control costs and yield loss for SLWF exceeded \$100 per acre for the state. Successful management was dependent upon proper timing of initial insecticide applications when thresholds were exceeded. Producers who were late with insecticide intervention faced a nearly impossible situation. Massive populations moved from cotton to fall vegetables in late summer and created havoc in terms of management in those crops. Hurricane Irma traveled across south Georgia on September 11th and caused significant damage to cotton in terms of yield. However, the hurricane also significantly reduced SLWF populations in cotton. In previous years we have observed SLWF populations rebound about 7 days after a hurricane. That was not the case in 2017 as economic populations did not return to cotton after Irma. Beginning in August we observed a naturally occurring fungus, *Isaria fumosorosea*, causing mortality in the field. Conservation of natural enemies and the use of insect growth regulators in a timely manner to prevent infield reproduction continued to be our most effective management program.

### **Forestry**

Over 27.7 million acres of Georgia (65%) is forested. Most of this forested land is classified as timberland, i.e., available for commercial use – the most in the nation. Georgia has been consistently ranked as the top timber state in the United States.

Numerous forest insects are problematic in Georgia forests, including emerald ash borer (*Agrilus planipennis*), southern pine beetle (*Dendroctonus frontalis*), redbay ambrosia beetle (*Xyleborus glabratus*), hemlock woolly adelgid (*Adelges tsugae*), black turpentine beetle (*Dendroctonus terebrans*), Ips engraver beetle (*Ips calligraphus*, *I. grandicollis*, *I. avulsus*), and pine tip moth (*Rhyacionia frustrana*).

Ips engraver beetle activity in 2017 was high due to drought conditions that occurred throughout the state. Ips engraver beetles generally attack logging debris, damaged branches, and trees undergoing stress. Infestations are normally restricted to a few trees. However, many large infestations were observed in Georgia in 2017. Infestation data gathered from the Georgia Forestry Commission (GFC) showed 278 large infestations (> five acres) and 5,000 small infestations (0.1 -0.25 acres). An estimated 6,500 acres of timber were lost to Ips engraver beetle infestations.

Thinning and prescribed burning are normal forest management practices that contribute to overall stand health and reduced insect pest issues when stands are healthy enough to withstand the stress of these activities. However, landowners were encouraged to refrain from these practices during and shortly following the drought to reduce stress on already compromised pines. Resuming normal stand management practices was encouraged after adequate rainfall and when stands have had sufficient time to recover their health and vigor.

Southern pine beetle was detected at 237 spots, which comprised a total of 325 damaged acres. Most spots were small, with 95% being less than five acres. Paulding, Bartow, and Cherokee Counties in the northwest part of the state had the most SPB activity in Georgia. Other spots were located in coastal and southeastern areas.

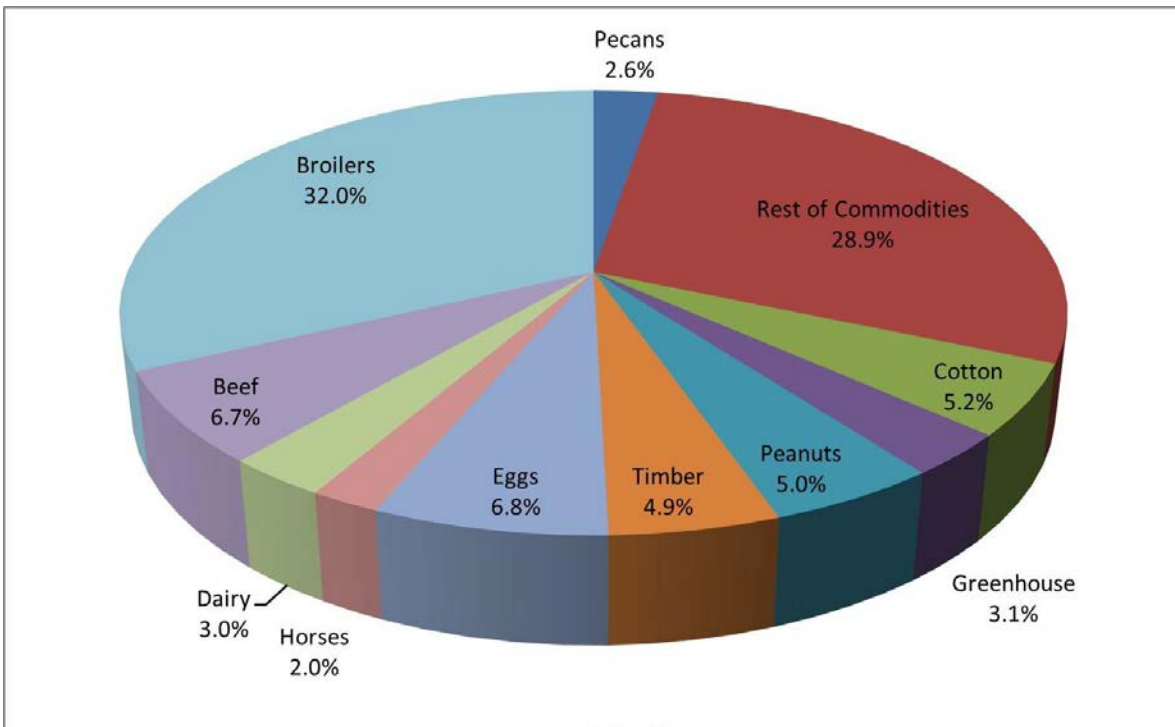
Pine tip moth continues to be a problem in young (1-5 year) pine stands, causing delays in growth and tree form issues. The economic value of injury caused by this pest is unknown; the trees are harvested approximately 20 years after the damage to young trees occurred. Current control methods include contact insecticide sprays timed to coincide with early instar larvae and limited use of systemic insecticides. Pine tip moth control is an area of ongoing University of Georgia research.

Emerald ash borer (EAB) was first detected in Georgia in 2013. In 2017 EAB was present in 23 Georgia counties, and approximately the northern 1/3 of the state was under a federal quarantine. In December 2017 the quarantine expanded to include the entire state. Systemic insecticides (imidacloprid, dinotefuran, emamectin benzoate) can be used to protect ash trees with control that ranges from 1 – 3 years, depending on the active ingredient. Insecticide protection is generally only used in valuable landscape settings and for select conservation areas.

### Livestock, Poultry, and Pets

Among Georgia’s Top 10 agricultural commodities, five are animal agriculture – broilers, laying hens, beef cattle, dairy cattle, and horses. Combined, the farm gate value of these five commodities is over half the state’s entire agricultural farm gate income. The figure below illustrates the significance of animal agriculture in the state.

**Georgia Top Ten Agricultural Commodities**



## Beef Cattle

Georgia ranks 30th nationally in cattle production, with about a million head produced annually, amounting to a farm gate value of over a billion dollars. Horn flies (*Haematobia irritans*) are the main pest of pastured cattle, causing cattle irritation and aggravation by their blood-feeding habit. More significantly, the cow's avoidance behaviors disrupt calf nursing, meaning calf weaning weights may be reduced by 18 pounds per calf compared with calves on mother cows with good horn fly control. Statewide, annual losses to horn flies on Georgia cow-calf operations are over \$14 million. Horn fly suppression is dependent on insecticides, although due to insecticide resistance there are few options that effectively reduce horn fly numbers for more than a few days. Stable flies, the other bloodsucking fly attacking cattle, account for over \$15 million in losses for Georgia cattle herds. To control horn flies and stable flies (as well as other ectoparasites such as face flies, lice, etc.), Georgia cattlemen invest ca. \$5.7 million annually.

## Broilers

Georgia continues to be the nation's number 1 broiler producing state. Broilers rank at the top of Georgia's agricultural commodities, bringing in \$4.4 billion annually, or 32% of the state's farm gate value.

Worldwide, darkling beetles (*Alphitobius diaperinus*), whose larvae are known as lesser mealworms, are the primary pest of broiler production. These insects burrow into insulation to pupate, damaging facilities and lowering insulative capacity. Costs of keeping heat in the buildings during winter and out in summer significantly increase production costs. When litter is removed and applied to pastures or fields as soil amendment, beetles are distributed and may migrate to nearby homes, creating neighborhood friction. Lesser mealworms feed on dead birds and feces, thereby acquiring numerous pathogens which they can transfer to uninfected birds when consumed. They also maintain Salmonella in their guts during pupation, so that newly emerged adult beetles are infectious to chickens. Chickens are predators and prone to eating insects; filling their digestive tracts with indigestible beetles prevents their consuming nutritious feed and gaining weight, as meat birds are intended to do. *Alphitobius* populations worldwide have been shown resistant to most of the pesticides registered for their suppression, so management strategies are extremely limited. Suppression efforts have some effect on beetle numbers, but there are no tactics that significantly reduce beetle populations.

All 12,000 Georgia broiler houses are infested with darkling beetles, and broiler producers spend approximately \$9 million annually for *Alphitobius* suppression. Statewide, losses to the beetles are estimated at \$4.5 million annually; lost production and control costs total ca. \$13.5 million annually in the state. Again, even the most conscientious and strategic intervention strategy is ineffective at suppressing *Alphitobius* beetles with current products and technology.

## Caged Layers

Table eggs are Georgia's 2nd most lucrative commodity, with an annual value to the state of over \$937 million (ranking Georgia 6th nationally). The principal pest in caged layer houses is the house fly (*Musca domestica*), which causes spotting of eggs, degradation of equipment through fecal contamination, and neighborhood consternation when flies migrate away from the poultry farm to nearby residences. Because of suitable conditions inside layer houses, house flies can be a year-round problem. Producers use manure and water management, trapping, biological control (fly parasitoids and predators), and various pesticides to suppress house flies around caged layer operations. Worldwide, house flies have been shown resistant to most insecticides, so control is seldom adequate. Losses due to flies combined with costs of management are estimated to total \$6.97 million annually.

Northern fowl mites (*Ornithonyssus sylviarum*) are the second most significant pest in layer flocks. These mites are bloodsuckers that spend their entire life cycle on the chicken host, causing itching, scabbing, anemia, and general bird discomfort and lack of thriftiness. Losses due to reduced feed conversion efficiency and reduced egg production are estimated at \$1.75 million annually, while suppression costs (primarily acaricides) are about \$1.7 million per year. Total cost is \$3.45 million statewide annually.

#### Pets

Approximately 3.5 million Georgia households have dogs and cats. The three major arthropod pests affecting pets are fleas, ticks, and mosquitoes. Because fleas transmit tapeworms, ticks transmit pathogens such as *Ehrlichia*, and mosquitoes carry heartworm, pest suppression is essential for disease prevention and to maintain pet health. In Georgia, expenditures for ectoparasite control on dogs and cats amount to over \$128 million annually.

#### Peach

Pest pressure from fruit-attacking insect pests, such as plum curculio (*Conotrachelus nenuphar*), Oriental fruit moth (*Grapholita molesta*), assorted stink bugs, and green June beetles in peach orchards across GA & SC was light to moderate in 2017, in part due to the substantial crop loss (due to freeze damage) across the Southeast. Premature tree decline associated with scale, lesser peachtree borer, and peachtree borer continues to cause serious losses. Cover sprays do little to control/suppress these key tree pests. Scale insects, such as San Jose scale (*Comstockaspis perniciosus*) in particular, are increasingly damaging. Scale control is very demanding but doable with rigorous application of dormant oils followed by block-specific responses with an insect growth regulator application for scale outbreaks through October. Regardless, every orchard needs to receive two dormant, dilute oil applications (200 gals/acre) applied at a low tractor speed (2-3 mph) each year. Prompt, aggressive, often multi-step follow-ups are required wherever outbreaks are observed.

Lesser peachtree borer (*Synanthedon pictipes*) control is stable where dilute, pre-bloom chlorpyrifos sprays are complimented by in-season cover sprays and a post-harvest application of chlorpyrifos. Peachtree borer (*Synanthedon exitiosa*) infestations are worsening. Peachtree borer populations (univoltine) are now showing the same upward population trends previously seen with the multivoltine lesser peachtree borer. Utilization of safer, but less effective, organophosphate-replacement cover



sprays for the past 15+ years appears to be the key element in the emergence of these previously well-controlled species as primary tree-killing insect pests. Utilizing the female sex pheromone of lesser peachtree borer for mating disruption of lesser peachtree borer and peachtree borer is an effective management strategy in the Mid-Atlantic and Upper Mid-Western peach production areas, but this technology has struggled or failed with our higher pest abundance and longer, warmer growing seasons. Cottrell et al. at the USDA-ARS have worked for years to adapt mating disruption to the southeastern lesser peachtree borer and peachtree borer complex. Results from a multi-year, 800+ acre, on-farm peachtree borer and lesser peachtree borer mating disruption trial are very promising. As such, the southeastern-formulated mating disruption pheromone, Isomate LPTB Plus, has been registered for use in Georgia and South Carolina for the 2018 season. Additionally, Shapiro-Ilan at the USDA-ARS is investigating curative applications of entomopathogenic nematodes for peachtree borer and lesser peachtree borers, which has shown promise on established infestations when used with an appropriate anti-desiccant to keep the borer wounds moist long enough for the nematodes to find larvae.

A sap beetle (*Carpophilus* spp.) and picnic beetle (*Glischrochilus* spp.) complex has emerged in recent years as an occasional, but where severe, damaging and difficult to control pest of sound, ripening mid- and late-season peaches. Problems seem to be more severe in wet years. In the fall of 2016, a graduate student began a project to identify the species and phenologies of the beetles attacking peaches and to develop a key to help growers detect, identify, and manage sap/picnic beetles in their orchards.

### **Peanut**

Insect pest problems in Georgia peanut were sporadic in 2017. Thrips pressure was generally light, though the pest was present at most locations. The incidence of Tomato Spotted Wilt Virus was greater in the southeast portion of the state's growing region in 2017 than it had been in several years. The use of liquid imidacloprid in the furrow at-plant continues to gain popularity with growers and is the second most common use pattern for thrips management after granular phorate in-furrow. Lesser cornstalk borer populations increased quickly in mid-May but declined after three weeks of widespread rainfall into the third week of June. While whiteflies were seen in peanut fields, infestations did not reach economic importance. 2017 was the second year in a row with increased incidence of rootworm (spotted and banded cucumber beetle) and wireworm (various species) injury. Few control options exist for these soil pests in peanut. The incidence of burrower bug injury and segregation 2 peanuts was relatively low in 2017, though severe losses were still incurred by some growers. A variety of caterpillar species were observed in peanut fields across the state, but none reached outbreak proportions, and control problems were limited. Overall, peanut growers in Georgia averaged an estimated 4400 pounds per acre on more than 820,000 planted acres in 2017, and the quality of the crop was very high.

### **Pecan**

The insect situation in 2017 was normal, with no outbreaks or unusual problems noted. The most often treated pests were aphids (Black pecan aphid, yellow pecan aphid, black-margined pecan aphid), which collectively required 2-3 treatments during the season. This reflects ca. \$20/acre cost; direct damage to

the current crop is essentially 0 and populations generally do not reach sustained levels that would reduce yield the following year. Approximately 50% of the managed acreage was treated for pecan weevil; the average was 2 treatments at \$3/treatment. There are ca. 150,000 managed acres in production, so cost of control for the major pests was ca. \$450,000 for weevil and \$7.5 million for aphids. Overall yield (after hurricane losses estimated at 30% of the crop) was 110 million pounds for the state. Crop loss due to weevils is estimated at \$500,000.

### **Sorghum**

Sorghum acreage in 2017 was 12,000 acres for grain production and 10,000 acres for forage/silage production. Grain yield averaged 54 bu/acre at a price of \$6.50 per 100 lb seed. Acreage was similar to 2015 due to lower commodity prices and cost of controlling the sugarcane aphid (SCA). SCA infestations were first detected in late April in southern GA and throughout the state by the end of June. SCA occurred on about every acre of sorghum. Virtually all grain sorghum hybrids were pretreated with the neonicotinoid insecticides clothianidin or thiamethoxam which provided good control for SCA for 30-40 days after planting. A Section 18 emergency use exemption was obtained again for use of Transform WG on sorghum for SCA control with a maximum of two applications per season. Almost all acres were treated once and some fields were treated twice with either Sivanto prime 200SL or Transform WG. Estimated cost of insecticide application for sugarcane aphid control was about \$15 to \$20 per acre. Some fields or portions of fields were severely damaged and abandoned. Sorghum midge infestations were absent or very low. Some later planted fields were treated for fall armyworm in the whorl or headworms (fall armyworm, corn earworm and/or sorghum webworm) on the grain heads. Control of SCA in silage and forage sorghum is problematic. A Section 18 label also was obtained for Sivanto prime for use on sweet sorghum for syrup production. This prevented severe damage in most sweet sorghum fields in 2017.

### **Soybean**

Insect pest problems in soybean were relatively minor during 2017. Foliage feeding caterpillars, including soybean looper and velvetbean caterpillar, and stink bugs were the most common pests infesting fields and requiring treatment. Kudzu bugs infested early planted soybeans and required treatment in some locations before crashing due to infection by *Beauvaria bassiana*.

### **Urban and Structural**

The tawny crazy ant, *Nylanderia fulva*, has shown up in Dougherty county (Albany, GA) in August 2013, Camden and Glynn counties along I-95 exits coming from Florida (August 2014), and Chatham (Garden City, GA), Lowndes (Valdosta, GA), and Brooks (Quitman, GA) Counties in 2015. There have been no detections in Georgia since. Our belief is that this major nuisance ant pest will be restricted to the lower half to one-third of GA and coastal GA. In our studies in Chatham County, at the Port of Savannah, we are seeing the rapid displacement of the red imported fire ant, *Solenopsis invicta*, by *N. fulva*. Control of

*N. fulva* is much like that for the Argentine ant, *Linepithema humile*. Fipronil (Termidor SC) used close to the structure only and applied directly to trailing ants is the best method to date, to control *N. fulva*. Elimination of excessive trash and debris is also critical, as it eliminates nesting sites.

Several changes to insecticide labels (pyrethroids and neonicotinoids) have occurred over the past several years. For pyrethroids, changes (in OTC and professional markets) restrict where products can be applied. To prevent water contamination, for instance, they cannot be applied to hard surfaces, cannot be applied more than 3 feet high, must be applied crack and crevice, and must be applied over overhangs when applied to soil. For neonicotinoids, new labels have a pollinator protection box with language mandating that products not be applied to plants with flowers on them.

Although bed bug problems continue to be common in Georgia (mainly in commercial accounts), many companies (including some large ones) not equipped to handle them (multiple visits and labor intensive), or averse to the liability, are not pursuing bed bug work. Although bed bugs garner lots of attention, termites and ants are still more profitable for most companies, especially those small to mid-sized companies which make up more than three-fourths of the industry (Suiter's estimate). On the pest control side, ants (Argentine ants) are arguably the number one pest encountered by companies who conduct residential pest control (most of them) in GA. A major problem that has emerged for those people who have been unfortunate enough to have found themselves with a bed bug infestation is the cost to remedy the problem. The cost of a bed bug treatment, over the past decade, has reached the cost of a residential termite treatment. And many residents, especially those living in low-income environments, are simply not fortunate enough to be able to afford to hire a pest management company to solve their problem. This, coupled with virtually no over-the-counter remedies, is fueling the search for low-cost, effective remedies available to homeowners.

Attractants for bed bug traps is an active area of research. The "ClimbUp" pitfall trap continues to be the industry standard for traps as monitors. Traps are not used as a pest control tool, but are good monitors. Heat continues to be used to control bed bugs, mainly as an alternative to pyrethroid resistant populations; pyrethroid resistance in bed bugs is severe and widespread. There are few chemicals on the horizon that will alleviate this situation; however, chlorfenapyr (Phantom, BASF) is a fairly widely incorporated residual, as is diatomaceous earth (Cimexa dust and Mother Earth dust). Essential oils are being looked at, but are not promising. Heat, when used improperly, can worsen bed bug problems by driving bugs from heated premises. Dogs as inspection tools are variable when it comes to efficiency; the handler has proven to be a key to the success of dogs as inspectors. Information about bed bugs, in the form of webinar archives, can be viewed at [www.gtbopec.com](http://www.gtbopec.com). Viewing is free.

### **Vegetables**

Spring crops were produced with relatively minor insect pest pressure in 2017. Thrips were very light in onions. Diamondback moth was less broadly distributed than in the previous year, but did present severe control issues when present because of resistance to multiple insecticide modes of action. Other caterpillar pests were relatively light in most crops. Squash bug has been emerging as a more consistent pest of cucurbits and can be difficult to control. Of special interest in 2017 was the apparent preference

of squash bug for grafted watermelons over non-grafted watermelons. This was seen in multiple fields in Georgia and was also reported in Florida.

Production of summer and fall crops presented multiple severe pest problems in vegetables.

The cowpea curculio remains as a crop threatening pest in cowpeas. No legal control methods which will provide adequate control have been identified to date. Evidence of a reproductive diapause has been documented; however, this occurs well after the commercial production season.

Silverleaf whitefly and associated viruses occurred earlier, over a wider area, and in more severe incidence than ever experienced before. Whiteflies actually occurred in treatable populations in late spring crops, which is uncommon. Sweet potatoes were likely injured by whiteflies, however, this has not been well documented as whiteflies normally occur after this crop is near harvest. While most vegetable crops were impacted by whitefly in the fall, tomato, snap bean, and cucurbit crops were most severely impacted because of viruses transmitted by the whitefly. Fall production of snap bean experienced an estimated 80 percent loss because of cucurbit leaf curl virus. Similarly, most fall cucurbit crops, particularly squash, experienced heavy losses (80 to 40 percent dependent on crop susceptibility to virus) because of cucurbit leaf crumple and other viruses transmitted by whitefly. Some tomato fields also experienced up to 100 percent loss because of tomato yellow leaf curl virus. It was noted that both whitefly population and virus incidence was greatly suppressed after passage of hurricane Irma in late fall.

Problems with broad mite in both pepper and eggplant were reported throughout much of southern Georgia. While growers in the area of Echols County were familiar with this pest problem, and did not experience heavy losses, growers in Colquitt, Brooks and other counties did experience yield losses in both crops.

Pepper weevil also presented severe problems in pepper and eggplant in the fall of 2017. Some infestations were reported earlier in the year, but populations in the fall exceeded anything previously experienced in these crops. Late production was eliminated in many pepper fields. In infested eggplant fields, adult weevils were present in a high percentage of blooms and an obvious reduction in blooms was noted, suggesting that weevils were causing bloom abscission. Bioassays conducted on field collected weevils indicated that pyrethroid insecticides, which have been the standard for control, were not effective in controlling pepper weevil.

Within the area pesticide regulation, two issues were of importance in vegetables. EPA did not remove chlorpyrifos uses, which was extremely important in some vegetables, particularly sweet potato and onion. Wireworms continue to be a severe pest of sweet potato and chlorpyrifos is a standard soil insecticide for these pests. This does remain as a concern as chlorpyrifos is still under registration review. Of extreme concern is the initiation of registration review of all pyrethroids. In light of their importance as the last of the broad spectrum insecticides, and the current emphasis on pollinator protection, this conflict could have huge implications on future pest management in many crops, particularly those reliant on insect pollinators.

**Wheat**

Harvest wheat acreage in 2017 was about 160,000 acres planted and 70,000 acres harvested with average statewide yield of 47 bu/acre at \$4.10/bu. Acreage was lower than previous years due to poor conditions at planting time and low commodity prices. Resistant varieties continue to be the main line of defense against the Hessian fly. Some fields of susceptible varieties had significant Hessian fly damage in the spring. Aphids and barley/cereal yellow dwarf disease levels were generally low in the coastal plain region but caused some damage in northern Georgia. Cereal leaf beetle infestations were low but some fields were treated in east-central Georgia. Scab disease is a major concern but was not as severe as the previous season.