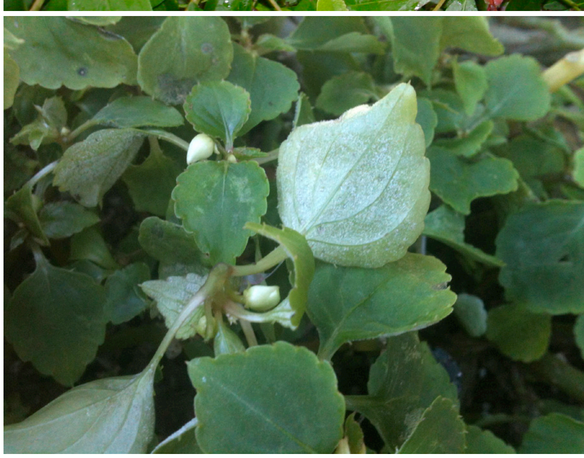
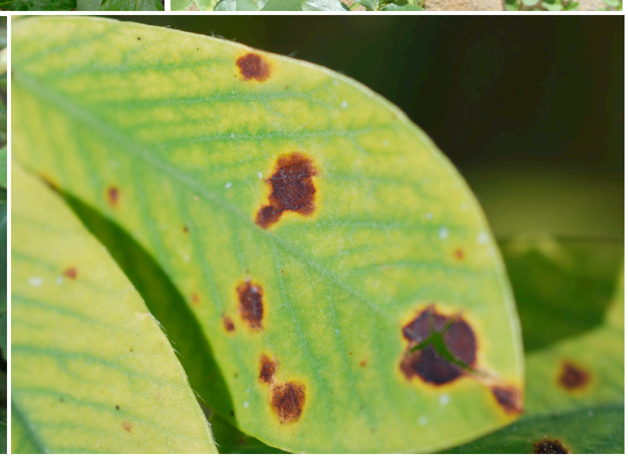
GEORGIA PLANT DISEASE LOSS ESTIMATES 2012



Compiled by Jean Williams-Woodward
Extension Plant Pathologist

2012 Georgia Plant Disease Loss Estimates

It is estimated that 2012 plant disease losses, including control costs, amounted to approximately $855.98 million. The value of the crops used in this estimate was approximately $6,647.83 million, resulting in a 12.9% total disease loss across all crops included in this summary.

The estimated values for most crops used to compute these disease losses are summarized in the UGA Center for Agribusiness and Economic Development, 2012 Georgia Farm Gate Value Report (AR-13-01). Some estimates for fruits, ornamentals, and turf rely on specialist's knowledge of the industry and industry sources for information.

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2012 PLANT DISEASE CLINICS ANNUAL SUMMARY

Extension Plant Pathology maintains plant disease clinics in Athens and Tifton to aid county Extension faculty in diagnosing and correcting disease related plant problems. Additionally, a laboratory for analysis for nematodes is maintained in Athens. The Plant Disease Clinic in Athens, operated by Ansuya Jogi, is located in Room 2405 Miller Plant Science Building. Samples analyzed in this clinic include commercial fruit, ornamentals, turf, Christmas trees and forestry; all homeowner samples; and legume forages, small grains, grain forages, mushroom identification, and wood rots. The Plant Disease Clinic in Tifton, operated by Jason Brock, is located in Room 116 of the Horticulture Building. Crops analyzed in this clinic include field crops, pecans, and commercial vegetables. The Extension Nematology Lab, operated by Dr Ganpati Jagdale, is located at 2350 College Station Rd. This clinic processes soil and plant samples for nematode analysis.

In 2012, 747 commercial plant samples were processed for diagnosis in Athens and 684 commercial plant samples were processed for diagnosis in Tifton. For the homeowners, 394 samples were analyzed. A total of 5,674 samples were analyzed for nematodes.

Diagnoses and educational recommendations are returned to the county faculty. All clinic samples are stored in Distance Diagnostics through Digital Imaging (DDDI), a web based database administered and supported by Sherri Clark, IT Associate Director, Consortium for Internet Imaging and Database Systems.

2012 PLANT DISEASE CLINIC SAMPLE SUMMARIES

PLANT SAMPLES DIAGNOSES			
Crop	**Commercial Samples**	**Homeowner IPM Samples**	**Total***
Field Crops	387	0	387
Fruits and Nuts	186	44	230
Ornamentals and Trees	245	125	370
Miscellaneous	6	6	12
Turf	319	169	488
Vegetables	288	50	338
Total	**1431**	**394**	**1825***

SAMPLES FOR NEMATODE DIAGNOSES	
Crop	**Samples**
Field Crops	3,378
Fruits & Nuts	43
Miscellaneous	517
Ornamentals	300
Trees	7
Turf	820
Vegetables	609
Total	**5,674**

*The total number of diagnoses is larger than the total number of samples received because some samples have more than one problem or diagnosis.

APPLE

Summer rots and fire blight are the major diseases that are consistently associated with economic losses to apple production in Georgia; however, although other diseases are generally controlled with good agricultural practices and fungicides, the cost of production is increased substantially in order to provide control of these less-aggressive diseases. Georgia had a moderately wet season, and as a result, moderate disease losses were observed, to include bitter rot, one of our primary summer rot diseases. There is still a strong need for more efficacious fungicides, especially for control of bitter rot and other summer rot diseases. In addition, though not yet observed, we are very concerned that streptomycin antibiotic resistance may yet become an issue; currently, streptomycin is the most effective antibiotic for fire blight management, though oxytetracycline is also registered. A resistance survey of the fire blight pathogen was conducted in 2012, and it did not expose resistance in the causal bacterial pathogen, *Erwinia amylovora*; however, other orchard bacteria were highly resistant to Streptomycin, indicating that transfer of resistance to *E. amylovora* is a clear danger. Fire blight was often observed in 2012, mainly due to a late freeze in April, which allowed bacterial entry in damaged leaf tissues. Cost of control included pesticide usage for fire blight, pruning costs, and summer rot control measures.

Disease*	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Fire Blight	1.00	96.9	70.0	166.9
Bitter Rot	1.00	96.9	100.0	196.9
Bot Rot	0.01	1.0	52.0	53.0
Black Rot	0.01	1.0	33.0	34.0
Alternaria Leaf Spot	0.01	1.0	0.0	1.0
Powdery Mildew	0.01	1.0	11.5	12.5
Sooty Blotch	0.01	1.0	0.0	1.0
Fly Speck	0.01	1.0	0.0	1.0
Cedar Apple Rust	0.01	1.0	0.0	1.0
Scab	0.01	1.0	0.0	1.0
Other Diseases	0.01	1.0	1.0	2.0
Total	**2.1**	**202.4**	**267.5**	**469.9**
*Controlled with fungicides applied for other diseases.				
Estimated by Phil Brannen, Extension Plant Pathologist				

BLACKBERRY

Blackberries are still a relatively new commodity for Georgia. Diseases have been a major reason for losses observed, and limited research information is available for this expanding market. In 2012, Botrytis fruit rot was observed in some locations; this disease is especially damaging when wet weather occurs during bloom. Resistance to numerous fungicide classes caused an increase in Botrytis levels. Several rust diseases were also observed in 2012, including orange rust and cane and leaf rust. Viruses, many of which can't be readily detected, continue to make their way into the state, and these have also caused significant losses. Fungicidal applications generally decreased losses to low levels relative to the total crop.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Botrytis	0.20	13.7	1,228.8	1,242.5
Orange Rust	0.01	0.7	153.6	154.3
Cane and Leaf Rust	0.10	6.8	614.4	621.3
Double Blossom	0.10	6.8	307.2	314.1
Viruses	5.00	342.1	153.6	495.7
Phytophthora Root Rot	0.10	6.8	30.7	37.6
Cane Blight	1.00	68.4	307.2	375.6
Septoria Leaf Spot	0.10	6.8	122.9	129.7
Botryosphaeria	0.10	6.8	153.6	160.4
Total	**6.7**	**459.0**	**3,072.1**	**3,531.1**
Estimated by Phil Brannen, Extension Plant Pathologist				

BLUEBERRY

Blueberry production in 2012 was reduced by freeze damage, excessive rainfall during harvest and the first major infestation of spotted-wing drosophila, a new invasive insect species. Diseases also had a major impact on production, as timely harvest was difficult, resulting in storage rots. Excessive rainfall also increased leaf rust, which showed up very early in the season. Mummy berry losses were low to moderate. Necrotic ring blotch, a new viral pathogen, was prevalent in some locations, and red ringspot virus was observed as well. Exobasidium leaf and fruit spot, an emerging disease, increased in both disease severity and prevalence, causing major losses and issues in the packing line for some sites. Bacterial leaf scorch, a newly identified bacterial disease of southern highbush blueberries, continued to cause losses on several varieties. Nematodes in replant sites also increased as an emerging issue, one that has only recently been identified.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Mummy Berry	0.1	239.9	4,349.8	4,589.7
Botrytis Blight	0.0	24.0	1,739.9	1,763.9
Foliar Disease	1.0	2,398.7	1,304.9	3,703.7
Rots	3.0	7,196.2	1,304.9	8,501.1
Bacterial Scorch	0.1	239.9	435.0	674.9
Dieback	0.1	239.9	435.0	674.9
Phytophthora Root Rot	0.1	239.9	435.0	674.9
Total	**4.4**	**10,578.4**	**8,699.6**	**20,582.9**
Estimate by Phil Brannen, Extension Plant Pathologist				

BUNCH GRAPE

Bunch grape diseases were prevalent in 2012, and both powdery and downy mildews were observed where spray programs were not well administered. The downy mildew epidemic was initiated later in the season, so fruit were not infected. Botrytis rot also generally increased, and fungicide resistance was confirmed in several vineyards with Botrytis issues. North Georgia is on the southern edge of the region where one can grow Vinifera (European) wine grapes; the limiting factor is Pierce's disease, a bacterial disease that is vectored by an insect, the glassy-winged sharpshooter. Cold winter temperatures kill the insect that transmits the disease, and low temperatures may actually prevent the bacteria from surviving from year to year in the plant. Cold temperatures, therefore, allow for production of Vinifera wine grapes, whereas warm winters result in increased disease. Pierce's disease losses were greater in 2012, and new infections from Pierce's disease were also observed, likely due to a warmer winter in 2011/2012. An indirect result of Pierce's disease mortality has been an increase in leaf roll viruses. This disease, caused by a complex of several viruses, was introduced through replanting of vines killed by Pierce's disease. Surveys of wine grape vineyards in 2012 indicated that these viruses have resulted in substantive losses, and leaf roll virus is now a major issue for the Georgia wine grape industry.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Botrytis	0.5	16.7	75.0	91.7
Downy Mildew	3.0	100.3	70.0	170.3
Black Rot	1.0	33.4	70.0	103.4
Powdery Mildew	3.0	100.3	20.0	120.3
Phomopsis Cane Blight	1.0	33.4	35.0	68.4
Crown Gall	0.01	0.3	1.0	1.3
Pierce's Disease	0.01	0.3	10.0	10.3
Leaf Roll Virus	0.10	3.3	5.0	8.3
Total	**8.6**	**288.1**	**286.0**	**574.1**
Estimate by Phil Brannen, Extension Plant Pathologist				

CORN

In 2012, corn for grain was harvested from 310,000 acres in Georgia with an average yield of 180 bu/A. The 2012 crop was valued at $412.9 million. Southern rust (*Puccinia polysora*) was a significant problem for many corn growers across Georgia in 2012. This disease had been detected by early June in extreme southwestern Georgia and, fueled by ample rainfall and warm temperatures, quickly affected corn production across the state. Additionally, a second virulent race of *P. polysora*, one able to successfully infect even those hybrids with the rpp9 gene for resistance, was confirmed again in 2012. Northern corn leaf blight (*Exserohilum turcicum*) was common again in 2012. Losses to aflatoxin were reduced as a result of ample rainfall in 2012.

The importance of damage from nematodes, e.g. sting, stubby root, and southern root-knot nematodes, continues to become more apparent as growers, consultants, and Extension agents are better able to diagnose symptoms in the field. Elevated losses to nematodes are largely the result of 1) a lack of nematode-resistant hybrids and 2) a lack of use of nematicides in affected fields.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Root & Stalk Rot	0.1	0.4	0.0	0.4
Nematodes	5.0	20.6	1.2**	21.8
Mycotoxins	0.5	2.1	0.0	2.1
Southern Corn Rust	3.5	50.6	3.75***	54.3
Northern Corn Leaf Blight	1.5	6.2	--***	6.2
Other Leaf Diseases*	trace	--	--***	--
Total	**10.6**	**79.9**	**4.95**	**84.8**

* "Other leaf diseases" primarily includes southern corn leaf blight (*Bipolaris maydis*) but may include diseases such as gray leaf spot as well.
** It is estimated that approximately 70,000 acres (20% of harvested acres) of corn were treated with 5 lb/A Counter insecticide-nematicide or a seed-treatment nematicide (AVICTA Complete Corn and Poncho VOTiVO) for control of nematodes.
*** It is estimated that 250,000 acres of corn were sprayed with fungicides at least once during the 2012 season at a cost of $5/A for application and $10/A for cost of fungicide.

Estimate by Robert Kemerait, Extension Plant Pathologist

COTTON

Cotton was harvested from an estimated 1,306,523 acres in 2012. The average lint yield was 1,090 lb/A. The crop was valued at $1.3 billion. Excellent growing conditions, rainfall was ample and temperatures were favorable, resulted in record yields in 2012. Losses to seedling disease, primarily Rhizoctonia seedling blight, or "soreshin," were not excessive in 2012. Stemphylium and target spot, "Corynespora leaf spot," diseases were both commonly observed in this season. In fact, target spot was especially severe in the 2012 season, likely because conditions favorable for growth and development of the cotton crop is also favorable for development and spread of this disease. Rainfall during the season resulted in an increase in severity of boll rot.

Losses to nematodes, primarily southern root-knot nematodes, continue to be one of the most important problems for cotton growers in Georgia. Until growers are able to practice effective crop rotation and increase the number of years between cotton crops in a field, the losses and damage from parasitic nematodes will continue to increase unless growers use nematicides effectively.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Boll Rot (lint)	3.0	39.0	0.0	39.0
Nematodes	**13.0**	**169.0**	**13.7**[a]	**182.7**
Southern root-knot	130.0	---	---	
Reniform	32.5	---	---	
Columbia lance	6.5	---	---	
Seedling Disease	0.5	6.5	1.0[b]	7.5
Fusarium Wilt	Trace	---	---	---
Ascochyta Blight	Trace	---	---	---
Stemphylium leaf spot	1.5	19.5	---	19.5
Corynespora leaf spot	2.0	26.0	1.9[c]	27.9
Total	**20.0**	**260.0**	**16.6**	**276.6**

[a] This figure is based upon an estimation that approximately 35% of the cotton acreage in the state is treated with a nematicide rate of Temik (5 lb/A or greater), 20% with AVICTA Complete Pak or AERIS Seed-Applied System, and approximately 5.0% of the acreage was treated with Telone II.
[b] This figure is an estimate of the cost of additional fungicide seed treatments that are used to manage seedling diseases. For this figure, it is estimated that approximately 15% of the cotton acreage in Georgia is treated with a fungicide in addition to the base seed treatment to manage seedling disease.
[c]This figure is based upon an estimate that 10% of the cotton acreage in the state was sprayed with a fungicide in 2012 to manage foliar diseases of cotton.

Estimate by Robert Kemerait, Extension Plant Pathologist

MUSCADINE GRAPE

Disease pressure was minimal in most muscadine vineyards due to moderate rainfall in southern Georgia counties where muscadines are grown. Good spray programs further resulted in minimal losses. As a native grape, muscadines generally have less disease pressure than European bunch (Vinifera) grapes. Rot diseases resulted in more direct losses than any other disease category, but there are now multiple fungicides that adequately control these diseases. An active fungicide program is required, and where producers are unable to spray effectively, diseases can be significant. Dead arm diseases were prevalent in 2012, due to winter cold injury; these trunk diseases result in relatively minor losses each year, but cold damage and/or stress are the primary drivers.

Disease*	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Bitter Rot	0.5	15.7	50.0	65.7
Macrophoma Rot	0.5	15.7	45.0	60.7
Ripe Rot	0.5	15.7	25.0	40.7
Angular Leaf Spot	0.5	15.7	10.0	25.7
Black Rot	0.5	15.7	0.0	15.7
Phomopsis Dead Arm	0.5	15.7	1.0	16.7
Total	**3.0**	**94.4**	**131.0**	**225.4**

*Controlled with fungicides applied for other diseases.

Estimate by Phil Brannen, Extension Plant Pathologist

ORNAMENTALS

The 2012 farm gate value for ornamental horticulture (excluding turf) was estimated at $468.93 million. This was down approximately 4.2% from 2011. Ornamental production value is closely tied to the economy and new construction. Farm gate value of ornamental production (greenhouse, nursery, and field nursery) has seen a reduction of $116.08 since its peak in 2007 (an almost 20% reduction in value). This has resulted in numerous ornamental production facilities to close in recent years. The ornamental disease loss estimate is only for ornamental production and excludes the value-added service industries because the true value, disease loss, and cost of control are not documented and vary greatly within the industry. This change was initiated in 2005, and is a major deviation from the disease loss estimates generated in years prior to 2005, as only farm-gate value of ornamental plant production is reported and used to develop the loss estimate.

Root rot diseases still account for the largest percentage of disease loss in commercial ornamental production. Cooler and wetter weather contributed to root disease and downy mildew diseases. Impatiens downy mildew became a major issue in 2012 and had the greatest impact on greenhouses and landscapers resulting in additional fungicide inputs and labor costs.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Bacterial diseases (fire blight, leaf spots)	0.2	0.94	0.7	1.64
Fungal leaf spots, stem cankers, needle blights	1.2	5.62	7.2	12.82
Root and crown rots	3.5	16.41	8.8	25.21
Powdery mildew	0.6	2.81	2.2	5.01
Botrytis blight	0.2	0.94	1.2	2.14
Virus (TSWV, INSV, Hosta Virus X, rose rosette)	0.6	2.81	0.1	2.91
Minor diseases (rust, downy mildew, nematode)	4.0	18.75	5.0	23.75
Total (Ornamental production)	**10.3**	**48.28**	**25.2**	**73.48**

Production Category (2010 Farm Gate Value)	% Reduction in Crop Value[1]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Field Nursery ($68.0)	2.0	1.36	1.9	3.26
Container Nursery ($141.77 M)	9.0	12.76	11.8	24.56
Floriculture (Greenhouse) ($259.16 M)	13.2	34.16	11.5	45.66
Total (Ornamental production)	**10.3**	**48.28**	**25.2**	**73.48**
[1] Column is not additive because disease losses are weighted according to production category				
Estimate by Jean Williams-Woodward, Extension Plant Pathologist				

PEACH

Despite wet conditions, peach production was good to excellent in 2012. Due to adequate fungicide programs, brown rot and scab diseases were of minimal consequence. Extensive surveys have indicated that brown rot fungicide resistance is prevalent in many locations, but field surveys allowed for prescription fungicide management (selection of fungicide classes for which resistance was not observed). Bacterial spot was not prevalent. *Armillaria* continued to be a major, expanding problem in replant peach production.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Brown Rot	0.1	34.3	2000.0	2034.3
Scab	0.01	3.4	1200.0	1203.4
Bacterial Spot	0.01	3.4	20.0	23.4
Phony Peach	0.1	34.3	230.0	264.3
Gummosis	0.1	34.3	20.0	54.3
Armillaria Root Rot	1.0	343.2	50.0	393.2
Phomopsis Constriction Canker	0.01	3.4	10.0	13.4
Total	**1.3**	**456.5**	**3,530.0**	**3,986.5**
Estimate by Phil Brannen, Extension Plant Pathologist				

PEANUT

According to 2012 reports, peanut was planted to 726,371 acres. Yields in 2012 averaged 4,630 lb/A for a total production valued at $891,855,186. Severity of tomato spotted wilt was low again in 2011 for reasons that included continued use of Peanut Rx (risk index) and peanut varieties with significantly improved resistance to the disease. Environmental conditions throughout much of the 2012 field season were cooler and wetter than normal. Aspergillus crown rot, a common early-season disease for peanut producers in Georgia, was less severe than in the recent past because of rainfall and cool temperatures at planting. White mold (stem rot) outbreaks were not as severe in 2012 as in many years because of cooler temperatures. Early and late leaf spot diseases, though a problem for some growers where peanuts were planted on a short rotation, were generally only a minor problem in 2012, despite an abundance of rainfall. The peanut root-knot nematode remained a problem in the south-central and southwestern regions of the state. Losses to nematodes were slightly lower in 2012 than in 2011 despite the fact that use of the nematicide Temik 15G was restricted because the product was in short supply. Cooler temperatures and abundant rainfall reduced stress on peanut plants affected by the plant-parasitic nematode, thus reducing overall loss to this pest. Development and spread of Cylindrocladium black rot (CBR) was slight in 2011 despite conditions that should have favored the disease. As the popular fungicide tebuconazole continued to be available in generic formulations, growers using the generic formulations were able to realize less expensive fungicide programs. However, growers must realize that other fungicides may provide better value by providing improved disease control.

Disease	% Reduction in Crop Value[a]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Leaf spots	2.0	17.8	34.2[b]	52.0
White mold	3.5	31.2	22.5[c]	53.7
Limb Rot	0.5	4.4	---[d]	4.4
Pod Rot	0.5	4.4	---[e]	4.4
Nematodes	2.0	17.8	3.6[f]	21.4
Cylindrocladium Black Rot	Trace	---	---	---
Seedling Disease	0.2	1.8	0.4[g]	2.2
Tomato Spotted Wilt	0.25	2.2	---	2.2
Diplodia Collar Rot	Trace	---	---	---
Total	8.95	79.6	60.7	140.3

[a] The total value of the crop was $891,855,186 according the Georgia Farm Gate Value Report.
[b] It was estimated that 55% of peanut acreage in Georgia receives some irrigation and that most of this acreage was sprayed with fungicides seven times during the season. Fungicide treatments for leaf spot control alone are about $8/acre per application. Growers usually sprayed non-irrigated fields less often, perhaps 4-5 times per season. This figure is based upon the cost to growers if they ONLY used fungicides (e.g. chlorothalonil) for leaf spot control. Only the approximate cost of the fungicide is factored into this figure.
[c] This figure reflects the additional cost BEYOND control of leaf spot if growers chose to use products such as azoxystrobin, tebuconazole, or flutolanil to control soilborne diseases at some point during the season. For non-irrigated fields, four applications were calculated at $5/A. For Irrigated fields, four applications at $10/A were calculated.
[d] Cost of control for limb rot is included in treatments for white mold.
[e] The cost of gypsum treatments applied to reduce pod rot has not been estimated.
[f] For the cost of nematode management, it was estimated that 10.0% of the acreage in Georgia is treated at a cost of $50/A.
[g] It was estimated that the cost to treat seed with fungicides is about $0.50/A.

Estimate by Robert Kemerait, Extension Plant Pathologist

PECAN

Leaf scab incidence and severity remained relatively low. Nut scab pressure was low-to-moderate depending on location. For most locations, dry weather early in the season led to low levels of scab until late, near, or after shell hardening. In University of Georgia fungicide trials in Tift County, non-treated controls of the cultivar 'Desirable' had nut scab severity ratings of 7.2% and 22.7% in late August. In addition to scab, anthracnose was a problem in isolated areas. Most all occurrences of anthracnose were on the leaves, with fruit infection being less common.

In 2012, pecan acreage was estimated to be 163,933 acres in Georgia with a total farm gate value of $249,398,409.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)[1]	Total ($ Millions)
Scab	1.5	3.7	23.6	27.3
Anthracnose	0	0	0	0
Brown Spot	0	0	0	0
Downy Spot	0	0	0	0
Powdery Mildew	0	0	0	0
Zonate Leaf Spot	0	0	0	0
Phytophthora Shuck and Kernel Rot	0	0	0	0
Total	1.5	3.7	23.6	27.3

[1] Eight treatments on 163,933 acres @ $18.00/A; scab fungicide programs are also effective against anthracnose, downy spot, brown spot, and powdery mildew in most cases; number of sprays varied by location.

Estimate by Jason Brock and Tim Brenneman, Extension Plant Pathologists

SOYBEAN

Because threat from Asian soybean rust, *Phakopsora pachyrhizi,* was significant in 2012 and because soybean yields were promising, many producers applied fungicides this season. In protecting against Asian soybean rust, growers also protected against other foliar diseases as well. Other diseases of importance included Phomopsis pod and stem blight, the *Diaporthe/Phomopsis* complex and, to some extent, southern blight. Plant parasitic nematodes (especially the southern root-knot nematode) continued to cause significant damage to the soybean crop in numerous fields across Georgia. In 2012, soybeans were harvested from 224,438 acres with an average yield of 54.35 bu/A. The total soybean production for Georgia in 2012 was valued at $126,664,100.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Soybean cyst nematode[1]	0.25	0.3	--	0.3
Root-knot nematodes	4	5.1	0.3	5.4
Other nematodes[2]	1.0	1.3	---	1.3
Asian soybean rust	1.0	1.3	3.75	5.05
Anthracnose	0.25	0.3	0	0.3
Brown leaf spot	Trace	---	0	---
Charcoal rot	Trace	---	0	---
Diaporthe/Phomopsis complex	0.5	0.6	0	0.6
Downy mildew	0.0	0.0	0	0.0
Frogeye leaf spot	Trace	---	0	---
Red crown rot	Trace	---	0	---
Pod and stem blight	2.0	2.6	0	2.6
Purple stain	Trace	---	0	---
Seedling diseases *(Rhizoctonia/Pythium/Fusarium)*	0.1	0.1	0.1	0.2
Southern blight	0.25	0.3	0	0.3
Stem canker	0.0	0.0	0	0
Fusarium Wilt	0.0	0.0	0	0
Virus diseases	0.0	0.0	0	0
Bacterial diseases	0.0	0.0	0	0
Total	**9.35**	**11.9**	**4.15**	**16.05**

[1] Resistant varieties are used to manage most nematode and disease problems, though Temik 15G is applied on occasion. Here it is estimated that Temik 15G (5 lb/A) was applied to 20,000 acres. It is estimated that fungicides were applied to 150,000 acres once and 50,000 acres twice for management of foliar diseases and were used as seed treatments to reduce seedling diseases on a small portion of the planted acreage. It is estimated that each fungicide application cost growers $15.00/A.
[2] "Other nematodes" includes reniform, sting, and Columbia lance nematodes.

Estimate by Robert Kemerait, Extension Plant Pathologist

STRAWBERRY

Foliar and fruit disease pressure was low to moderate in 2012. Botrytis (gray mold) was an issue, and resistance to numerous fungicides was reported in multiple locations. Phytophthora, Pythium, and Rhizoctonia root rots were often damaging; these diseases were introduced from nurseries, and the increasingly poor quality of strawberry transplants is of concern. Leaf scorch and anthracnose was also observed in some locations. Strawberry calyx disorder was prevalent; this is a poorly understood condition, and no explanation was available as to why the environment was conducive for this condition. However, overall, it was a good year for strawberry production.

There is concern that the strobilurin fungicides, which are heavily and virtually exclusively utilized for control of anthracnose, may be developing resistance. There is a strong need for fungicides with different modes of action if strawberry production is to continue in Georgia.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Gray Mold	0.1	10.1	443.4	453.5
Fungal Leaf Spots	0.1	10.1	138.0	148.1
Anthracnose	0.1	10.1	147.8	157.9
Root Rots & Nematodes	2.0	202.1	246.3	448.4
Angular Leaf Spot	0.0	1.0	9.9	10.9
Total	**2.3**	**233.4**	**985.4**	**1218.8**
Estimated by Phil Brannen, Extension Plant Pathologist				

TURFGRASS

In 2012, it was estimated that there were 1.98 million acres of turf with a maintenance value of $1.85 billion in Georgia. There were 21,728 acres used for sod/stolons production in the state, yielding a farm gate value of $83,700,746. Unseasonably warm temperatures during the winter of 2011-2012 precluded turfgrass from going totally dormant across the state. In many areas, especially in the southern part of the state, warm season grasses presented an active growth during winter. Several diseases were active throughout the winter and were carried over from the previous fall. *Rhizoctonia solani* infection on warm season grasses initiated in early fall of 2011 and did not ceased until May 2012, causing major outbreaks in the state. Numerous and early cases of leaf and sheath blight (mini-ring) disease caused by *Rhizoctonia zeae* were registered throughout the state on bermudagrass greens. Incidences of *R. zeae* were presumably initiated by warm temperatures reaching mid 80s during late February to early March 2012. Rust infections caused by *Puccinia* species were ubiquitous and prevalent in zoysiagrass and tall fescue. *Bipolaris* spp. was particularly problematic on bermudgrass during the summer and fall of 2012. As expected *Sclerotinia homoeocarpa* was prevalent throughout the state in several turfgrass species. *Gaeumannomyces* spp. (causal agent of take all root rot/root decline of warm season grasses/bermudagrass decline) continued to be prevalent throughout the state. No or very few incidences of *Ophiosphaerella* spp. (spring dead spot) affecting *Cynodon* spp. (bermudagrass) were observed in 2012. In general, cool-season grasses had only minor disease incidences and made it through 2012 without major problems. There were nearly 468 turfgrass samples received at the UGA plant disease clinic during 2012, with the large majority of them formed by warm season grasses. Over 500 nematodes analysis were submitted to the UGA nematology laboratory from warm and cool-season swards.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Soil-borne and Crown Diseases	4.0	62.90	37.00	99.90
Foliar Diseases	1.5	27.75	18.50	46.25
Nematodes	0.3	5.55	5.55	11.1
Total	**5.8**	**96.20**	**61.05**	**157.25**
Estimate by Alfredo Martínez-Espinoza, Extension Plant Pathologist				

VEGETABLES

About 150,000 acres of vegetables, worth a total of ca. $935 million, were grown in Georgia in 2012. Drought conditions were prevalent for most of the growing season which kept many diseases from becoming problematic. Downy mildew (*Peronospora destructor*) devastated about 45% of the Vidalia Onion crop and heavy losses were reported all over the onion growing region. Black mold (*Aspergillus niger*) on Vidalia Onions caused severe losses in stored onions. Fusarium wilt of watermelon continues to increase in incidence and caused some early season losses. Losses to *Phytophthora capsici* on bell pepper and cucurbits were below average. The most prevalent disease on tomatoes and peppers again was bacterial spot, caused by *Xanthomonas campestris* pv. *vesicatoria.* New resistant bell pepper varieties are beginning to help reduce losses to bacterial spot.

Major Vegetable Crops	% Reduction in Crop Value[1]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Watermelon	1.0	1.5	5.6	7.1
Squash (yellow + zucchini)	1.0	0.44	1.3	1.7
Tomato	1.0	0.40	2.8	3.2

Other Vegetable Crops	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Pepper (bell)	1.5	1.6	2.0	3.6
Cucumber	1.5	0.65	1.9	2.5
Snap Bean	1.0	0.51	1.3	1.8
Greens	1.0	0.33	1.3	1.6
Cabbage	1.0	0.45	0.7	1.2
Onion (dry)	10.0	16.3	4.0	20
Cantaloupe	1.0	0.22	2.3	2.5
Eggplant	0.5	0.36	0.4	0.8
Total	**2.4[1]**	**22.76**	**27.2**	**46.0**

[1] This column is not additive due to the way losses for vegetables are tabulated.
Total values for vegetable commodities are taken from the 2012 farm gate values (AR-13-01).

Estimate by David B. Langston, Jr., Extension Plant Pathologist

WHEAT

The farm gate value of wheat in 2012 in Georgia was $104,369,607. Wheat was harvested from 268,542 acres with an average yield of 81.84 bu/acre. Environmental conditions were initially dry in early fall 2011 with rainfall and cooler temperatures in November. Unusually warmer temperatures from December 2011 to March 2012 generated excessive foliar growth and discouraged appropriate vernalization in cold hardy varieties. Powdery mildew (*Blumeria graminis* f. sp *tritici*) incidences were high in south Georgia producer's fields in 2012. Powdery mildew was observed at moderate levels at breeding plots located in Tifton, Plains, and Calhoun UGA experimental stations. Incidences of stripe rust (*Puccinia striiformis)* were low to nil and no widespread epidemics were reported in the state. Leaf rust (*Puccinia triticina*) and leaf and glume blotch were maintained at low to moderate levels due to the dry conditions of the spring 2012. Helminthosporium leaf blotch (spot blotch) caused by *Bipolaris/Drechslera sorokinina* and tan spot (*Pyrenophora tritici-repentis*) were observed at low levels across the southern part of the state, due in part to the warm conditions prevalent during the winter 2011-2012. Barley Yellow Dwarf Virus (BYDV) incidences were prevalent across the state in 2012 caused by high aphid populations. Low to nil incidences of soilborne wheat mosaic virus (SBMV) and wheat spindle streak mosaic virus (SSMV) were observed due to the warm temperatures present in the state.

Wheat Diseases	**% Reduction in Crop Value**	**Damage ($ Millions)**	**Cost of Control ($ Millions)**	**Total ($ Millions)**
Leaf Rust/Stripe Rust	0.3	0.31	0.31	0.62
Glume Blotch	0.2	0.20	0.10	0.30
Powdery Mildew	0.5	0.52	0.31	0.83
Barley Yellow Dwarf Virus	1.0	1.04	0.52	1.56
Soilborne Wheat Mosaic/ Spindle Streak Mosaic Virus	0.2	0.20	0.10	0.30
Stinking/loose Smut	-----	-----	-----	------
Total	**2.2**	**2.27**	**1.34**	**3.61**
Estimate by Alfredo Martinez-Espinoza, Extension Plant Pathologist				

SUMMARY OF TOTAL LOSSES DUE TO DISEASE DAMAGE AND COST OF CONTROL IN GEORGIA – 2012

Crop or Commodity	Estimated Crop Value ($ Millions)	% Reduction in Crop Value[1]	Value of Damage ($ Millions)	Cost of Control ($ Millions)	Total Disease Loss (Damage & Control) ($ Millions)	Total % of Loss [1, 2]
Apple	9.64	2.1	0.2024	0.2675	0.4699	4.9
Blackberry	6.85	6.7	0.459	3.07	3.53	51.5
Blueberry	240.45	4.4	10.58	8.70	20.58	8.6
Bunch Grape	3.35	8.6	0.2881	0.286	0.57	17.1
Corn	412.9	10.6	79.9	4.95	84.8	20.5
Cotton	1,300.0	20.0	260.0	16.6	276.6	21.3
Muscadine Grape	3.15	3.0	0.0944	0.131	0.23	7.2
Ornamentals	468.93	10.3	48.28	25.20	73.48	15.7
Peach	35.12	1.3	0.4565	3.53	3.99	11.4
Peanut	891.86	8.95	79.6	60.7	140.3	15.7
Pecan	249.40	1.5	3.7	23.6	27.30	10.9
Soybean	126.66	9.35	11.9	4.15	16.05	12.7
Strawberry	10.15	2.3	0.2334	0.9854	1.22	12.0
Turfgrass	1,850.0	5.8	96.2	61.05	157.25	8.5
Vegetable	935.0	2.4	22.76	27.2	46.0	4.9
Wheat	104.37	2.2	2.27	1.34	3.61	3.5
TOTALS	6,647.83	9.3	616.92	241.76	855.98	**12.9**

[1] This column is not additive.
[2] Total % loss for each crop and grand total is figured on the basis of: (Value of Damage + Cost Control) / Crop Value

ATTENTION!
Pesticide Precautions

1. Observe all directions, restrictions and precautions on pesticide labels. It is dangerous, wasteful and illegal to do otherwise.

2. Store all pesticides in original containers with labels intact and behind locked doors. KEEP PESTICIDES OUT OF THE REACH OF CHILDREN.

3. Use pesticides at correct label dosage and intervals to avoid illegal residues or injury to plants and animals.

4. Apply pesticides carefully to avoid drift or contamination of non-target areas.

5. Surplus pesticides and containers should be disposed of in accordance with label instructions so that contamination of water and other hazards will not result.

6. Follow directions on the pesticide label regarding restrictions as required by State or Federal Laws and Regulations.

7. Avoid any action that may threaten an endangered species or its habitat. Your county Extension agent can inform you of endangered species in your area, help you identify them, and through the Fish and Wildlife Service identify actions that may threaten endangered species or their habitat.

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