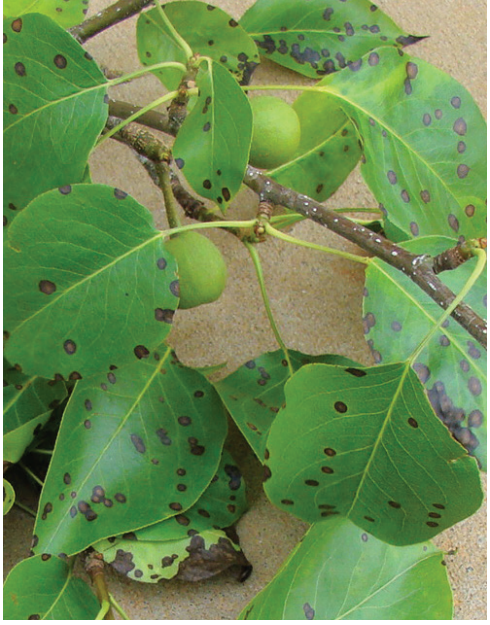

2017 GEORGIA PLANT DISEASE LOSS ESTIMATES

Compiled by Elizabeth L. Little

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UNIVERSITY OF GEORGIA
EXTENSION

2017 GEORGIA PLANT DISEASE LOSS ESTIMATES

2017 plant disease losses, including control costs, amounted to an estimated $936 million. The value of the crops used in this estimate was approximately $6,634 million, resulting in a 14.1% relative 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 2017 Georgia Farm Gate Value Report (AR-18-01) published by the UGA Center for Agribusiness and Economic Development. Some estimates for fruits, ornamentals, and turf rely on specialists' knowledge of the industry and industry sources for information.

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2017 PLANT DISEASE CLINICS ANNUAL SUMMARY

The Department of 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 nematode analysis is maintained in Athens. The Plant Disease Clinic in Athens, operated by Ansuya Jogi, is located in room 2405 Miller Plant Sciences Building. Samples analyzed in this clinic include commercial fruit, ornamentals, turf; all homeowner samples, small grains, 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 pecans, field crops, and commercial vegetables. The specialists associated with the clinics are Phillip Brannen, Jason Brock, Bhabesh Dutta, Bob Kemerait, Elizabeth Little, Alfredo Martinez-Espinoza, Jonathan Oliver and Jean Williams-Woodward. The Extension Nematology Lab, operated by Ganpati Jagdale, is located at 2350 College Station Rd. This clinic processes soil and plant samples for nematode analysis.

In 2017, 1863 physical and digital commercial and homeowner samples were processed for plant disease diagnosis. A total of 4,783 samples were processed for nematode analysis. The information on all clinic samples is stored in Distance Diagnostics through Digital Imaging (DDDI), a web-based database.

2017 PLANT DISEASE CLINIC SAMPLE SUMMARIES

PHYSICAL and DIGITAL SAMPLES			
Crop	**Commercial Samples**	**Homeowner Samples**	**Total**
Field Crops	245	2	247
Fruits and Nuts	128	46	174
Miscellaneous	4	6	10
Ornamentals and Trees	387	256	643
Turf	170	109	279
Vegetables	432	78	510
Total	**1366**	**497**	**1863**
NEMATODE SAMPLES *(prepared by the nematology lab)*			
Crop	**Grower**	**Research**	**Total**
Field Crops	506	2554	3060
Fruits and Nuts	111	250	361
Ornamentals	231	0	231
Miscellaneous	91	8	99
Trees	1	0	1
Turf	413	222	635
Vegetables	61	316	377
No Crop	16	3	19
Total	**1430**	**3353**	**4783**

APPLE

Summer rots and fire blight are the major diseases consistently associated with economic losses to apple production in Georgia. 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. Fire blight, a bacterial disease, was prevalent in 2017, due to ideal environmental conditions for infection during bloom. Disease losses and expenditures for controlling diseases were above average in 2017, as rainfall was prevalent throughout the growing season, allowing for disease establishment. Bitter rot, one of our primary summer rot diseases, caused significantly greater than average losses. There is still a strong need for more efficacious fungicides, especially for control of bitter rot. The 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	3.00	325.5	90.0	415.5
Bitter Rot	5.00	542.5	140.0	682.5
Bot Rot	0.02	2.2	52.0	54.2
Black Rot	0.01	1.1	33.0	34.1
Alternaria Leaf Spot	0.01	1.1	0.0	1.1
Powdery Mildew	0.01	1.1	11.5	12.6
Sooty Blotch*	0.01	1.1	0.0	1.1
Fly Speck*	0.10	10.9	0.0	10.9
Cedar Apple Rust*	0.01	1.1	0.0	1.1
Scab*	0.01	1.1	0.0	1.1
Other Diseases	0.01	1.1	1.0	2.1
Total	**8.2**	**888.6**	**327.5**	**1216.1**

*Controlled with fungicides applied for other diseases.

Estimated by Phil Brannen, Extension Plant Pathologist

BLACKBERRY

Blackberries are still a relatively new crop for Georgia. Diseases have been a major reason for losses observed, and limited research information is available for this expanding market. In 2017, diseases were relatively low; however, above-average rainfall did result in an increase in Phytophthora root rot and Botryosphaeria in some locations. Fungicidal applications generally decreased losses. Viruses, many of which cannot be readily detected, also caused significant losses. Cane diseases including orange cane blotch and cane blight were most frequently observed. As with many other fruit crops, low chill hours caused protracted bloom and reduced yields in 2017.

Disease	% Reduction in Crop Value	Damage *($ Thousands)*	Cost of Control *($ Thousands)*	Total *($ Thousands)*
Botrytis	0.10	4.6	232.6	237.2
Orange Rust	0.01	0.5	29.1	29.5
Cane and Leaf Rust	0.01	0.5	116.3	116.7
Double Blossom	0.01	0.5	58.1	58.6
Viruses	2.00	92.0	29.1	121.1
Phytophthora Root Rot	0.10	4.6	5.8	10.4
Cane Blight	0.50	23.0	58.1	81.1
Leaf Spots	0.05	2.3	23.3	25.6
Botryosphaeria	0.10	4.6	29.1	33.7
Total	**2.9**	**132.5**	**581.4**	**713.9**

Estimated by Phil Brannen, Extension Plant Pathologist

BLUEBERRY

Several diseases impacted blueberry production in 2017. Low chill hours and a late freeze event negatively impacted production. Phomopsis dieback was observed, and the late freeze led to increased damage from Botrytis. Although mummy berry was present, losses were low to moderate where good fungicide programs were implemented. Above-average rainfall resulted in increased mortality due to Phytophthora and other root rots in some plantings. Necrotic ring blotch virus was prevalent in some locations but was generally spotty in appearance. Exobasidium leaf and fruit spot was present and generally well controlled by most producers through fungicide applications during the dormant period, but some unsprayed sites were severely impacted. Bacterial leaf scorch damaged numerous plantings in 2017. Significant damage from anthracnose was also noted.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Mummy Berry	0.1	0.2	6.3	6.5
Botrytis Blight	1.0	2.4	2.4	4.8
Foliar Disease	1.5	3.6	1.8	5.4
Rots	3.0	7.3	1.8	9.1
Bacterial Scorch	0.4	1.0	0.6	1.6
Dieback	0.1	0.2	0.6	0.8
Phytophthora Root Rot	0.6	1.5	0.6	2.1
Total	**6.7**	**16.2**	**14.1**	**30.3**

Estimated by Jonathan Oliver, Extension Plant Pathologist

BUNCH GRAPE

Excessive rainfall provided for ideal fungal disease development in bunch grapes, and disease losses were substantial in many vineyards. Downy mildew was observed early on fruit where spray programs were not well administered, and it caused near-100% losses in some vineyards. Virtually all vineyards lost some production to downy mildew and various fruit rots and cane diseases, especially Botrytis, powdery mildew, and downy mildew. North Georgia is on the southern edge of the region where one can grow *Vitis vinifera* (European) wine grapes. The limiting factor is Pierce's disease, a bacterial disease that is vectored by the glassy-winged sharpshooter. Cold winter temperatures kill the insect that transmits the disease, and low temperatures may actually prevent the bacterium from surviving from year to year in the plant. Therefore, cold temperatures allow for production of *V. vinifera* wine grapes, whereas warm winters result in increased disease. Pierce's disease losses increased substantially in 2017 due in part to warmer temperatures the previous winter. An indirect result of Pierce's disease mortality has been an increase in grape leafroll virus. This disease, caused by a complex of several viruses, was introduced through replanting of vines killed by Pierce's disease. Grape leafroll virus, as well as other viruses, are now a major production problem for the Georgia wine grape industry. Many vineyards are now replanting vines as a result of these diseases.

Disease	% Reduction in Crop Value	Damage *($ Thousands)*	Cost of Control *($ Thousands)*	Total *($ Thousands)*
Botrytis	3.0	352.9	85.0	437.9
Downy Mildew	8.0	940.9	200.0	1140.9
Black Rot	2.0	235.2	90.0	325.2
Powdery Mildew	4.0	470.5	30.0	500.5
Phomopsis Cane Blight	2.0	235.2	40.0	275.2
Crown Gall	0.01	1.2	1.0	2.2
Pierce's Disease	1.50	176.4	20.0	196.4
Grape Leafroll Virus	0.10	11.8	5.0	16.8
Total	**20.6**	**2424.1**	**471.0**	**2895.1**

Estimated by Phil Brannen, Extension Plant Pathologist

CORN

In 2017, corn for grain was harvested from 323,534 acres in Georgia with an average yield of 181.9 bu/A. The 2017 crop was valued at $244.1 million. Much of the 2017 field season in Georgia was hot and dry, as was 2016, and estimated losses were similar to 2016. Conditions were generally unfavorable for aggressive spread of southern corn rust (*Puccina polysora*) or northern corn leaf blight (*Exserohilum turcicum*) and losses associated with these diseases were low. However, these same hot and dry conditions were very favorable for aflatoxin, especially in non-irrigated fields.

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. Heat and drought exacerbated losses to plant-parasitic nematodes in 2017. Elevated losses to nematodes are largely the result of a lack of nematode-resistant hybrids and the limited use of nematicides in affected fields.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Root and Stalk Rot	trace	---	---	---
Nematodes	6.5	15.9	1.0**	16.9
Mycotoxins	0.5	1.2	---	1.2
Southern Corn Rust	1.5	3.7	1.9***	5.6
Northern Corn Leaf Blight	0.3	0.7	--***	0.7
Other Leaf Diseases*	trace	---	--***	--
Diplodia Ear Rot	---	---	---	--
Total	**8.8**	**21.5**	**2.9**	**24.4**

* "Other leaf diseases" primarily includes southern corn leaf blight (*Bipolaris maydis*) but may include diseases such as gray leaf spot.

** It is estimated that approximately 48,530 acres (15% 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 30% of the corn acreage was sprayed with fungicides once during the 2017 season and 10% twice at a cost of $5/A for application and $10/A for cost of fungicide.

Estimated by Robert Kemerait, Extension Plant Pathologist

COTTON

Cotton was planted to an estimated 1,282,034 acres in 2017. The average lint yield was 871.8 lb/A. The crop was valued at $901.5 million. Disease and nematode losses in Georgia were affected largely by the environmental conditions during the 2017 season. Warm soil conditions early in the season reduced losses to seedling diseases. Hot and dry conditions later in the season increased losses to nematodes and Fusarium wilt. A late-season hurricane greatly increased losses to boll rots and also increased losses to areolate leaf spot. This is the first time this disease has been included in the disease loss estimates. Bacterial blight was not a significant problem.

Losses to nematodes, primarily southern root-knot nematodes, continue to be one of the most important problems for cotton growers in Georgia. Heat and drought stress on the cotton crop exacerbates damage from nematodes. 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 plant root-knot nematode-resistant varieties or use nematicides effectively.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Boll Rot (Lint)	5.0	45.1	---	45.1
Nematodes	10.0	90.1	21.1*	111.2
Southern Root-Knot	(8.0)	(72.1)	---	---
Reniform	(1.0)	(9.0)	---	---
Columbia Lance	(trace)	(--)	---	---
Sting	(1.0)	(9.0)		
Seedling Disease	0.5	4.5	0.6**	5.1
Fusarium Wilt	0.25	2.2	---	2.2
Ascochyta Blight	trace	---	---	---
Stemphylium Leaf Spot	1.25	11.3	---	11.3
Target Spot	0.5	4.5	2.6***	7.1
Areolate Mildew (Ramularia Leaf Spot)	0.25	2.2		2.2
Bacterial Blight	0.1	0.9		0.9
Total	**17.9**	**160.8**	**24.3**	**185.1**

* Based upon an estimation that approximately 35% of the cotton acreage in the state is treated with AVICTA Complete Cotton, BioST, 20% with AgLogic or Velum Total, and approximately 5.0% with Telone II. COPeO Prime seed treatment was also used, but was included in the cost of FiberMax seed.

** Estimate of the cost of additional fungicide seed treatments used to manage seedling diseases. Approximately 10% of the cotton acreage in Georgia is treated with a fungicide in addition to the base seed treatment (or seed-treatment nematicide) to manage seedling disease.

*** Based upon estimate that 20% of the cotton acreage was sprayed with a fungicide in 2017 to manage foliar diseases.

Estimated by Robert Kemerait, Extension Plant Pathologist

MUSCADINE GRAPE

Disease pressure, especially from fruit rots, was above average in 2017. Good fungicidal spray programs generally result in minimal losses, but ripe rot and other diseases were severe in some vineyards. This may have been a result of poor spray programs, but fungicide resistance, combined with conducive weather conditions, may have been involved. As a native grape, muscadines (*Vitus rotundifolia*) generally have fewer disease problems than European bunch grapes (*V. vinifera*), so fungicides are more effective when applied to muscadines. An active fungicide program is required, and where producers are unable to spray effectively, diseases can be significant.

Disease	% Reduction in Crop Value	Damage *($ Thousands)*	Cost of Control *($ Thousands)*	Total *($ Thousands)*
Bitter Rot	1.0	99.0	70.0	169.0
Macrophoma Rot	1.0	99.0	50.0	149.0
Ripe Rot	2.0	198.0	35.0	233.0
Angular Leaf Spot	0.6	59.4	10.0	69.4
Black Rot*	0.6	59.4	0.0	59.4
Phomopsis Dead Arm	0.5	49.5	1.0	50.5
Total	**5.7**	**564.4**	**166.0**	**730.4**

* Controlled with fungicides applied for other diseases.

Estimated by Phil Brannen, Extension Plant Pathologist

ORNAMENTAL HORTICULTURE

The 2017 farm gate value for ornamental horticulture (container nurseries, field nurseries and greenhouses) was estimated at $719.55 million, an increase of $0.65 million over 2016. Both container nursery and greenhouse production decreased from 2016. However, field (mostly tree) nursery production increased 11% over 2016. Ornamental production farm gate value is closely tied to new residential and business construction. The ornamental disease loss estimate includes only commercial plant production and excludes the value-added service industries because the value, disease loss, and cost of control are not documented and vary greatly within the industry.

Root diseases still account for the largest percentage of disease loss in commercial ornamental production. Boxwood blight, caused by *Calonectria pseudonaviculata*, continues to be of concern to ornamental production as well as the landscape industry. The wetter conditions of 2017 contributed to an increase in boxwood blight in landscapes. Boxwood blight is not found in production nurseries and nurseries preventatively treat boxwoods to lessen the risk of disease introduction. Needle blight diseases on Leyland cypress, junipers, and pine were more prominent in 2017. Rose rosette virus remains a concern and the disease is particularly problematic in landscapes in northern Georgia.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Bacterial Diseases (Fire Blight, Leaf Spots)	0.3	2.2	1.0	3.2
Fungal Leaf Spots, Stem Cankers, Needle Blights	3.0	21.6	9.1	30.7
Root and Crown Rots	3.5	25.2	8.9	34.1
Powdery Mildew	0.6	4.3	2.1	6.4
Downy Mildew	0.3	2.2	3.2	5.4
Botrytis Blight	0.3	2.1	1.2	3.3
Viruses (TSWV, INSV, Rose Rosette, Hosta Virus X)	0.3	2.2	0.3	2.5
Minor Diseases (Rusts, Nematodes)	0.2	1.4	1.1	2.5
Total	**8.5**	**61.2**	**26.9**	**88.1**

Production Category *(2015 Farm Gate Value)*	% Reduction in Crop Value*	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Field Nursery ($115.42 M)	2.4	2.7	2.0	4.7
Container Nursery ($160.82 M)	8.9	14.4	12.3	26.7
Floriculture (Greenhouse) ($443.97 M)	9.9	44.1	12.6	56.7
Total	**8.5**	**61.2**	**26.9**	**88.1**

* Column is not additive because disease losses are weighted according to production category.

Estimated by Jean Williams-Woodward, Extension Plant Pathologist

PEACH

Peach production was substantially reduced in 2017 due to lower chill hours following a warmer than average winter and cold damage during bloom. Due to adequate fungicide programs, brown rot and scab diseases were of minimal consequence on the remaining peach crop. However, many orchards were not sprayed due to lack of sufficient fruit, which resulted in increased carryover fungal inoculum for 2018. The recommended fungicides worked remarkably well. 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 also not prevalent, again indicating that the bacterial control recommendations are relatively effective, even under excessive rainfall conditions. Armillaria root rot continued to be a major, expanding problem in replant peach production. Of concern, phony peach, caused by the bacterium *Xylella fastidiosa*, increased in production orchards, likely as a result of overall warming temperatures. This disease takes trees out of production, so an increase in prevalence is particularly troubling.

Disease	% Reduction in Crop Value	Damage *($ Thousands)*	Cost of Control *($ Thousands)*	Total *($ Thousands)*
Brown Rot	0.1	30.5	2080.0	2110.5
Scab	0.01	3.1	1555.0	1558.1
Bacterial Spot	0.01	3.1	30.0	33.1
Phony Peach	0.4	122.0	250.0	372.0
Gummosis	0.1	30.5	20.0	50.5
Armillaria Root Rot	1.0	305.1	50.0	355.1
Phomopsis Constriction Canker	0.01	3.1	10.0	13.1
Total	**1.6**	**497.3**	**3995.0**	**4492.3**

Estimated by Phil Brannen, Extension Plant Pathologist

PEANUT

In 2017, peanut was harvested from 831,215 acres. Yields in 2017 averaged 4,483 lb/A for a total production valued at $825 million. Disease and nematode losses in Georgia were affected largely by the environmental conditions during the 2017 season. Warm soil conditions early in the season increased losses to Aspergillus crown rot. Hot and dry conditions later in the season increased losses to southern stem rot (white mold), especially in non-irrigated fields. A late-season hurricane increased losses to leaf spot diseases. Losses to tomato spotted wilt in 2017 were estimated to be 3%, down slightly from 2016.

The peanut root-knot nematode remained a problem in the south-central and southwestern regions of the state. However, availability of Velum Total and AgLogic 15G for management of nematodes helped to reduce this problem. Development and spread of Cylindrocladium black rot (CBR) and was slight.

Disease	% Reduction in Crop Value[a]	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Leaf Spots	1.5	12.4	40.3b	52.7
White mold (*Sclerotium*)	8	66.0	25.4c	91.4
Limb Rot (*Rhizoctonia*)	0.1	0.8	---d	0.8
Pod Rot	Trace	---	---e	---
Nematodes	4.0	33.0	8.0f	41.0
Cylindrocladium Black Rot	Trace	---	---	---
Seedling Disease	1.5	12.4	---g	12.4
Tomato Spotted Wilt Virus	3.5	24.8	---	24.8
Diplodia Collar Rot	Trace	---	---	---
Total	**18.1**	**149.4**	**73.7**	**223.1**

[a] The total value of the crop was $825.0 million according the Georgia Farm Gate Value report.

[b] An estimated 55% of peanut acreage in Georgia receives some irrigation and most of this acreage was sprayed with fungicides 7 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, prothioconazole, tebuconazole, or flutolanil to control soilborne diseases at some point during the season. For non-irrigated fields, four applications were calculated at $5.00/A. For irrigated fields, four applications at $11.00/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 5.0% of the acreage in Georgia is treated at a cost of $85/A and 15% at $36/A.

[g] The cost of the fungicide seed treatment is absorbed in the cost of the seed.

Estimated by Robert Kemerait, Extension Plant Pathologist

PECAN

The growing season started out relatively dry, resulting in lower leaf scab potential early in the year. However, frequent rains in June resulted in high levels of nut scab. Overall, the 2017 season had moderate to high scab pressure.

Most commercial growers in the southern part of the state made ten or more fungicide applications to control scab successfully. In University of Georgia fungicide trials in Tift County, non-treated controls of the cultivar 'Desirable' had nut scab severity ratings of 67.8% and 69.3% in late August. This level of scab on the fruit would result in a near 100% loss.

In 2017 the estimated pecan acreage in Georgia was 177,582 acres with a total farm gate value of $401.1 million.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)**	Total *($ Millions)*
Scab	7.0	28.1	31.9	60.0
Anthracnose	0.0	0.0	0.0	0.0
Brown Spot	0.0	0.0	0.0	0.0
Downy Spot	0.0	0.0	0.0	0.0
Powdery Mildew	0.0	0.0	0.0	0.0
Zonate Leaf Spot	0.0	0.0	0.0	0.0
Phytophthora Shuck and Kernel Rot	0.0	0.0	0.0	0.0
Total	**7.0**	**28.1**	**31.9**	**60.0**

* Nine treatments on 177,582 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.

Estimated by Jason Brock and Tim Brenneman, Extension Plant Pathologists

SOYBEAN

Conditions in the 2017 field season were generally hot, dry and unfavorable for the development and spread of Asian soybean rust, *Phakopsora pachyrhizi*, and other foliar diseases during much of the season. Because the threat from Asian soybean rust was low, many producers did not apply fungicides this season. Plant parasitic nematodes (especially the southern root-knot nematode) continued to cause damage to the soybean crop in numerous fields across Georgia. In 2017, soybeans were planted to a reported 183,485 acres with an average yield of 43.05 bu/A. The total soybean production for Georgia in 2017 was valued at $77.1 million.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)**	Total *($ Millions)*
Soybean Cyst Nematode*	Trace	---	---	---
Root-Knot Nematodes	5.0	3.9	---	3.9
Other Nematodes**	0.25	0.2	---	0.2
Asian Soybean Rust	0.1	0.1	0.8	0.9
Anthracnose	0.25	0.2	---	0.2
Brown Leaf Spot	0	---	---	---
Charcoal Rot	Trace	---	---	---
Diaporthe/Phomopsis Complex	Trace	---	---	---
Downy Mildew	Trace	---	---	---
Frogeye Leaf Spot	0.25	0.2	---	0.2
Red Crown Rot	Trace	---	---	---
Cercospora Leaf Blight	0.25	0.2	---	0.2
Pod and Stem Blight	0.5	0.4	---	0.4
Purple Stain	Trace	---	---	---
Seedling Diseases (*Rhizoctonia/Pythium/Fusarium*)	0.1	0.1	0.1	0.2
Southern Blight (*Sclerotium*)	0.5	0.4	---	0.4
Stem Canker	0	---	---	---
Fusarium Wilt	Trace	---	---	---
Virus Diseases	0	---	---	---
Bacterial Diseases	0	---	---	---
Total	7.2	5.7	0.9	6.6
Total	**8.0**	**28.5**	**28.6**	**57.1**

* Resistant varieties are used to manage most nematode and disease problems; Temik 15G is generally no longer available. Fungicides were applied to an estimated 50,000 acres for management of foliar diseases and were used as seed treatments to reduce seedling diseases on a small portion of the planted acreage. Each foliar fungicide application is estimated to cost growers $15.00/A.

** "Other nematodes" includes reniform, sting, and Columbia lance nematodes.

Estimated by Robert Kemerait, Extension Plant Pathologist

STRAWBERRY

Foliar and fruit disease pressure was moderate in 2017. Botrytis (gray mold) was a limited issue, although resistance to numerous fungicides was reported in multiple locations. Phytophthora, Pythium, and Rhizoctonia root rots were sometimes damaging. Significant anthracnose was observed in some locations. Overall, it was an excellent year for strawberry production. There is concern that the pathogens causing anthracnose (*Colletotrichum* spp.) are developing resistance to some fungicides, but no resistance was confirmed where severe disease pressure was observed. There is a strong need for fungicides with different modes of action if we are to continue strawberry production in Georgia.

Disease	% Reduction in Crop Value	Damage *($ Thousands)*	Cost of Control *($ Thousands)*	Total *($ Thousands)*
Gray Mold	0.3	29.1	400.5	429.7
Fungal Leaf Spots	0.1	9.7	124.6	134.3
Anthracnose	0.4	38.8	133.5	172.4
Root Rots and Nematodes	2.0	194.2	222.5	416.7
Angular Leaf Spot	0.0	1.0	8.9	9.9
Total	**2.8**	**272.9**	**890.1**	**1163.0**

Estimated by Phil Brannen, Extension Plant Pathologist

TURFGRASS

In 2017 in Georgia, there were 2.5 million acres of turf encompassing all turfgrass industries (golf, sport fields, sod production, lawncare, residential and commercial landscapes) with a maintenance value of $1.94 billion. There were 26,991 acres used for sod/stolons production in the state, yielding a farm gate value of $116.68 million. Near seasonal temperatures during the winter of 2016-2017 resulted in typical dormancy in warm season grasses. However, warmer than normal temperatures in early spring 2017 incited early green-up and a late frost in May resulted in widespread injury of warm season turfgrasses, especially in centipedegrass. Poor centipedegrass green-up was a common diagnosis for samples submitted to the plant disease clinic. Intermittent rain in early spring resulting in outbreaks of large patch of warm season grasses caused by *Rhizoctonia solani*. Damage from dollar spot caused by *Sclerotinia homoeocarpa*, and leaf spots caused by *Bipolaris* spp. and *Drechslera* spp. were constant through the 2017 growing season, particularly on bermudagrass and annual ryegrass during the spring and fall. *Gaeumannomyces* spp. (causal agent of take all root rot/root decline of warm season grasses/bermudagrass decline) continued to be prevalent throughout the state. High summer temperatures exerted severe stress in bentgrass and tall fescue. Pythium root and crown rot as well as anthracnose (*Colletotrichum cereale*) were ubiquitous. Gray leaf spot (*Magnaporthe grisea*) was common on St. Augustinegrass in 2017. Plant parasitic nematode damage was common on bent and bermudagrass greens. Numerous abiotic problems including cultural and environmental issues, nutritional deficiencies, excessive thatch problems and soil compaction were commonly diagnosed in all turf species. Minor infections of rust and fairy ring were also observed. *Ophiosphaerella* spp. (spring dead spot, or SDS) affecting *Cynodon* spp. (bermudagrass) were numerous in the northern areas of the state. SDS in golf courses was minimal due to preventative care in the fall. There were 460 turfgrass samples received at the UGA plant disease clinic in Athens and the turfgrass pathology lab in Griffin during 2017, with warm season grasses comprising a large majority of the samples. There were 388 turf soil samples submitted to the UGA nematology laboratory for nematode analysis.

Disease	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Soilborne and Crown Diseases	3.5	67.9	19.4	87.3
Foliar Diseases	1.5	29.1	9.7	38.8
Nematodes	0.5	9.7	9.7	19.4
Total	**5.5**	**106.7**	**38.8**	**145.5**

Estimated by Alfredo Martínez-Espinoza, Extension Plant Pathologist

VEGETABLES

Approximately 150,000 acres of vegetables were grown in Georgia in 2017 with a total value of ca. $1.2 billion. The dry conditions during the spring and the mid-fall growing seasons, especially during harvest, exacerbated whiteflies and whitefly-transmitted viral diseases in cucurbits, solanaceous and bean crops. Whitefly-transmitted viral diseases such as *C*ucurbit leaf crumple virus and Cucurbit yellow stunt disorder virus were particularly severe. Fusarium wilt of watermelon (*Fusarium oxysporum* f. sp. *niveum*) caused greater losses than normal in spring and summer crops. Center rot (*Pantoea ananatis*) and post-harvest rot (bacterial and fungal origin) problems in onion were observed resulting in economic losses. Black rot (*Xanthomonas campestris* pv. *campestris*) in cruciferous crops has been a growing issue for vegetable growers. Southern blight in tomato and snap beans (*Sclerotium rolfsii*) also caused economic losses.

Major Vegetable Crops	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Watermelon	10.0	14.2	6.0	20.2
Squash (Yellow and Zucchini)	35.0	18.0	20.0	38.0
Tomato	15.0	6.9	22.3	29.2

Other Vegetable Crops	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Pepper (Bell)	5.0	5.3	4.0	9.3
Cucumber	18.0	8.0	8.4	16.4
Snap Bean	45.0	12.5	8.5	21.0
Greens	15.5	4.2	3.7	7.9
Cabbage	10.8	4.0	2.9	6.9
Onion (Dry)	2.5	2.4	3.8	6.2
Cantaloupe	8.0	2.4	3.2	5.6
Eggplant	0.5	0.1	0.4	0.5
Total	**10.2***	**78.0**	**83.2**	**161.2**

* This column is not additive because disease losses are weighted according to production category.

Estimated by Alfredo Martínez-Espinoza, Extension Plant Pathologist

WHEAT

Wheat farm gate value in 2017 in Georgia was $26.7 million. Wheat was harvested from 133,889 acres with an average yield of 48.29 bu/acre. Wheat acreage was reduced across the state by 4.8% in 2017 compared with the previous year. The top five wheat-producing counties (by area) were Dooly, Sumter, Randolph, Pulaski, and Lee. Fall of 2016 was dry and wheat planted at research locations needed irrigation to produce an adequate stand. Wheat plantings across the state received adequate rainfall from late November into early March, but spring rainfall was low. A late spring freeze severely damaged earlier varieties across the state. In 2017, Barley yellow dwarf virus (BYDV) was observed at low levels across the state. Fusarium head blight (FHB, or scab) (*Fusarium graminearum*) incidence was low across the state. After several years of high levels of FHB, the dry spring prevented infections from starting. The late freeze damaged early-headed varieties and prevented early infections. However, high corn acreage ensures that a ready supply of inoculum is available when climatic conditions are more favorable for FHB. Powdery mildew (*Blumeria graminis* f. sp. *tritici*), stripe rust (*Puccinia striiformis*) and leaf rust (*Puccinia triticina*) infections were low in the state in 2017. Stagonospora spot blotch, tan spot, and wheat streak mosaic virus infections were observed at low levels in Georgia. In oats, Drechslera leaf spot, frost damage, and BYVD were widespread. Oat crown rust (*Puccinia coronata*) was observed at very high levels throughout the state in 2017.

Diseases	% Reduction in Crop Value	Damage *($ Millions)*	Cost of Control *($ Millions)*	Total *($ Millions)*
Leaf Rust/Stripe Rust	0.5	0.13	0.00	0.13
Glume Blotch	0.5	0.13	0.00	0.13
Powdery Mildew	0.0	0.00	0.00	0.00
Fusarium Head Blight	0.5	0.13	0.26	0.39
Barley Yellow Dwarf Virus	0.5	0.13	0.13	0.26
Soilborne Wheat Mosaic/ Spindle Streak Mosaic Virus	0.0	0.00	0.00	0.00
Total	**2.0**	**0.52**	**0.39**	**0.91**

Estimated by Alfredo Martínez-Espinoza, Extension Plant Pathologist

SUMMARY OF TOTAL LOSSES DUE TO DISEASE DAMAGE AND COST OF CONTROL IN GEORGIA – 2017

Crop or Commodity	Estimated Crop Value *($ Millions)*	% Reduction in Crop Value*	Value of Damage *($ Millions)*	Cost of Control *($ Millions)*	Total Disease Loss *(Damage & Control) ($ Millions)*	Total % of Loss*, **
Apple	9.96	8.2	0.89	0.33	1.22	12.2
Blackberry	4.47	2.9	0.13	0.58	0.71	15.9
Blueberry	226.64	6.7	16.2	14.1	30.3	13.4
Bunch Grape	9.34	20.6	2.4	0.47	2.89	30.9
Corn	244.1	8.8	21.5	2.9	24.4	10.0
Cotton	901.55	17.9	160.8	24.3	185.1	20.5
Muscadine Grape	9.34	5.7	0.56	0.17	0.73	7.8
Ornamentals	719.55	8.5	61.2	26.9	88.1	12.2
Peach	30.01	1.6	0.5	4.0	4.50	15.0
Peanut	825.04	18.1	149.4	73.7	223.1	27.0
Pecan	401.15	7.0	28.1	31.9	60.0	15.0
Soybean	77.09	7.2	5.7	0.90	6.6	8.6
Strawberry	9.44	2.8	0.27	0.89	1.16	12.3
Turfgrass	1940.0	5.5	106.7	38.8	145.5	7.5
Vegetable	1200.0	10.2	78.0	83.2	161.2	13.4
Wheat	26.69	2.0	0.52	0.39	0.91	3.4
TOTALS	**6634.37**	**---**	**632.87**	**303.53**	**936.4**	**14.1**

* This column is not additive.

** Total percent loss for each crop and the grand total is figured on the basis of the 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 nontarget 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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