GEORGIA PLANT DISEASE LOSS ESTIMATES 2014




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2014 Georgia Plant Disease Loss Estimates

2014 plant disease losses, including control costs, amounted to an estimated $753.78 million. The value of the crops used in this estimate was approximately $6245.99 million, resulting in a 12.07% total percent 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 & Economic Development, 2014 Georgia Farm Gate Value Report (AR-15-01). Some estimates for fruits, ornamentals, and turf rely on specialist's knowledge of the industry and industry sources for information.

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2014 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 of 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; legume forages, small grains, grain forages 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 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 2014, 1071 physical and digital samples were processed for diagnosis in Athens and Griffin and 611 physical and digital samples were processed for diagnosis in Tifton. For the homeowners, 424 samples were analyzed. A total of 6130 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, the IT Associate Director for Consortium for Internet Imaging and Database Systems (CIIDS).

2014 PLANT DISEASE CLINIC SAMPLE SUMMARIES

PLANT SAMPLES DIAGNOSES			
Crop	**Commercial Samples**	**Homeowner Samples**	**Total**
Field Crops	207	2	209
Fruits and Nuts	162	47	209
Miscellaneous	8	6	14
Ornamentals and Trees	308	195	503
Turf	154	119	273
Vegetables	419	55	474
Total	**1,258**	**424**	**1,682**

SAMPLES FOR NEMATODE DIAGNOSES			
Crop	**Samples**	**Crop**	**Samples**
Field Crops	4,562	Trees	21
Fruits and Nuts	97	Turf	359
Miscellaneous	43	Vegetables	826
Ornamentals	222		
Total of all nematode samples			**6,130**

APPLE

Summer rots and fire blight are the major diseases that are 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. Late freezes increased fire blight, as damaged tissue was infected by the bacterial pathogen. Kasugamycin, a new antibiotic for control of fire blight, was registered, and this added another means of management to our arsenal. Disease losses and expenditures for controlling diseases were average in 2014, as rainfall was sufficient for disease establishment. Bitter rot, one of our primary summer rot diseases, caused losses as usual. There is still a strong need for more efficacious fungicides, especially for control of bitter rot. 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	2.00	262.7	90.0	352.7
Bitter Rot	2.00	262.7	120.0	382.7
Bot Rot	0.01	1.3	52.0	53.3
Black Rot	0.01	1.3	33.0	34.3
Alternaria Leaf Spot	0.01	1.3	0.0	1.3
Powdery Mildew	0.01	1.3	11.5	12.8
Sooty Blotch	0.01	1.3	0.0	1.3
Fly Speck	0.01	1.3	0.0	1.3
Cedar Apple Rust	0.01	1.3	0.0	1.3
Scab*	0.01	1.3	0.0	1.3
Other Diseases	0.01	1.3	1.0	2.3
Total	**4.1**	**537.2**	**307.5**	**844.7**
*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 2014, disease was minimal, although Botrytis fruit rot was observed in some locations. Botrytis is especially damaging when wet weather occurs during bloom. Viruses, many of which cannot be readily detected, continue to make their way into the state and cause significant losses. Fungicidal applications generally decreased losses. Cane diseases were not as prevalent in 2014, although orange cane blotch and cane blight still topped the list of diseases observed.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Botrytis	0.10	5.6	311.2	316.8
Orange Rust	0.01	0.6	38.9	39.5
Cane and Leaf Rust	0.01	0.6	155.6	156.2
Double Blossom	0.01	0.6	77.8	78.4
Viruses	2.00	112.3	38.9	151.2
Phytophthora Root Rot	0.01	0.6	7.8	8.3
Cane Blight	0.50	28.1	77.8	105.9
Septoria Leaf Spot	0.05	2.8	31.1	33.9
Botryosphaeria	0.05	2.8	38.9	41.7
Total	**2.7**	**153.9**	**778.0**	**931.9**

Estimated by Phil Brannen, Extension Plant Pathologist

BLUEBERRY

Blueberry production in 2014 was valued at $335.3 million but was impacted dramatically by several diseases. Early-season freezes increased disease losses to mummy berry; however, losses were low to moderate where good fungicide programs were utilized. Phytophthora and other root rots caused substantial mortality, especially in young plantings and this was directly related to exceptional rainfall from the prior year. Rust disease increased in 2014, and came in earlier than expected. Necrotic ring blotch, a new viral pathogen, was prevalent in some locations, but it was generally reduced and of minimal impact. Exobasidium leaf and fruit spot was not as prevalent, as new disease management techniques were adapted by producers – a direct impact of research and extension programs. Bacterial leaf scorch, a recently identified bacterial disease of southern highbush blueberries, was less prevalent. Nematodes in replant sites continued to decrease as an issue, since educational efforts have resulted in fumigation prior to planting. Many blueberry bushes sustained cold damage in November, allowing for introduction of Botryosphaeria fungi and subsequent death of canes and sometimes whole plants.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Mummy Berry	0.2	0.7	5.7	6.4
Botrytis Blight	0.0	0.03	2.3	2.3
Foliar Disease	1.1	3.6	1.7	5.3
Fruit Rots	3.2	10.6	1.7	12.3
Bacterial Scorch	0.1	0.35	0.6	0.95
Dieback	0.1	0.35	0.6	0.95
Phytophthora Root Rot	0.5	1.8	0.6	2.4
Total	**5.2**	**17.4**	**13.2**	**30.6**
Estimated by Phil Brannen, Extension Plant Pathologist				

BUNCH GRAPE

Rainfall was sufficient for disease development, although not excessive. Bunch grape diseases were not as prevalent in 2014, though both powdery and downy mildews were observed where spray programs were not well administered. Virtually all vineyards lost production to downy mildew and various fruit rots and cane diseases, but losses were limited as compared with the previous year. 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 exceptionally greater in 2014, with one vineyard losing nearly 100 percent of production due to this disease. This was likely due to warmer weather in the previous winters. 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. Leaf roll virus, as well as other viruses, 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	36.1	75.0	111.1
Downy Mildew	5.0	360.9	90.0	450.9
Black Rot	2.0	144.4	70.0	214.4
Powdery Mildew	3.0	216.6	20.0	236.6
Phomopsis Cane Blight	2.0	144.4	35.0	179.4
Crown Gall	0.01	0.7	1.0	1.7
Pierce's Disease	1.00	72.2	10.0	82.2
Leaf Roll Virus	0.10	72.2	5.0	12.2
Total	**13.6**	**982.5**	**306.0**	**1,288.5**
Estimated by Phil Brannen, Extension Plant Pathologist				

CORN

In 2014, corn for grain was harvested from 355,424 acres in Georgia with an average yield of 178.6 bu/A. The 2014 crop was valued at $264.8 million. Throughout much of the corn-growing season, conditions were hot and dry. Still, southern rust (Puccinia polysora) had been detected across much of the Coastal Plain by early June. The impact of this disease was severe in many fields, especially in those not protected with a fungicide and in later-planted fields. Conditions were unfavorable for northern corn leaf blight (Exserohilum turcicum) and losses associated with this disease were low. However, these same hot and dry conditions were very favorable for aflatoxin, especially in non-irrigated fields. Diplodia ear rot, so important in 2013, was not observed in 2014. Lastly, charcoal rot, a disease made more severe during periods of stress, was of greater importance in 2014 than in 2013.

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 2014. Elevated losses to nematodes are largely the result of 1) lack of nematode-resistant hybrids and 2) lack of use of nematicides in affected fields..

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Root & Stalk Rot	0.5	1.3	0.0	1.3
Nematodes	6.5	17.2	1.3**	18.5
Mycotoxins	0.4	1.0	0.0	1.0
Southern Corn Rust	7.0	18.5	5.3***	23.8
Northern Corn Leaf Blight	0.5	1.3	--***	1.3
Other Leaf Diseases*	trace	0	--***	--
Diplodia Ear Rot	trace	0	0.0	--
Total	**14.9**	**39.3**	**6.6**	**45.9**

* ”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 95,377 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 50% of the corn acreage was sprayed with fungicides at least once during the 2014 season 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 1,377,751 acres in 2014. The average lint yield was 862 lb/A. The crop was valued at $964.7 million. Conditions were dry during much of the 2014 growing season and temperatures were generally very warm. Losses to seedling disease, primarily Rhizoctonia seedling blight, or "soreshin," were less severe than in 2013 when conditions were cooler and wetter at planting. For the same reason, early-season outbreaks of Ascochyta leaf blight were much less common in 2014 than in 2013. "Target spot" and boll rot diseases were less problematic in 2014 because of dry conditions during much of the season.

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. Loss of Temik 15G from the growers' arsenal has increased the difficulty in control of nematodes.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Boll Rot (lint)	2.0	19.3	0.0	19.3
Nematodes	**13.0**	**125.4**	**18.6[a]**	**144.0**
Southern root-knot	(10.0)	(96.5)	---	---
Reniform	(2.5)	(24.1)	---	---
Columbia lance	(0.1)	(1.0)	---	---
Sting	(0.4)	(2.8)		
Seedling Disease	2.0	19.3	0.6[b]	19.9
Fusarium Wilt	0.1	1.0	---	1.0
Ascochyta Blight	trace	---	---	---
Stemphylium leaf spot	2.0	19.3	---	19.3
Target "Corynespora" leaf spot	0.5	4.8	1.0[c]	5.8
Total	**19.6**	**189.1**	**22.7**	**209.3**

a This figure is based upon an estimation that approximately 55% of the cotton acreage in the state is treated 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 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.

c This figure is based upon an estimate that 5% of the cotton acreage in the state was sprayed with a fungicide in 2014 to manage foliar diseases of cotton.

Estimated by Robert Kemerait, Extension Plant Pathologist

MUSCADINE GRAPE

Disease pressure, especially fruit rots, increased dramatically in 2014. This was due to excessive rainfall. Good fungicidal spray programs generally resulted in minimal losses. As a native grape, muscadines generally have less disease pressure than European bunch (*Vinifera*) grapes, so fungicides are more effective when applied to muscadines. An active fungicide program is required, and where producers were unable to spray effectively, diseases were significant.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Bitter Rot	0.6	38.8	60.0	98.8
Macrophoma Rot	0.6	38.8	50.0	88.8
Ripe Rot	0.6	38.8	30.0	68.8
Angular Leaf Spot	0.6	38.8	10.0	48.8
Black Rot	0.6	38.8	0.0	38.8
Phomopsis Dead Arm	0.5	32.3	1.0	33.3
Total	**3.5**	**226.2**	**151.0**	**377.2**

Estimated by Phil Brannen, Extension Plant Pathologist

ORNAMENTALS

The 2014 farm gate value for ornamental horticulture (excluding turf) was estimated at $490.20 million, which is a 5.6% increase over 2013. Field and container nursery production had a moderate increase of $7.61 million and greenhouse (floriculture) production increased by $19.64 million in farm gate value over 2013. Ornamental production value is closely tied to the economy and new construction. Numerous ornamental production facilities have closed in recent years across the state. The ornamental disease loss estimate is only for ornamental 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 rot diseases still account for the largest percentage of disease loss in commercial ornamental production. The greatest concern in 2014 was the discovery of boxwood blight, caused by Calonectria pseudonaviculata, in Atlanta landscapes. Cooler and wetter weather continued to contribute to root rot and downy mildew diseases. Although Rose Rosette Virus continues to increase in landscapes, it has not been detected in production nurseries.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Bacterial diseases (fire blight, leaf spots)	0.4	2.0	1.0	3.0
Fungal leaf spots, stem cankers, needle blights	2.0	9.8	8.8	18.6
Root and crown rots	4.0	19.6	8.8	28.4
Powdery mildew	0.6	2.9	2.2	5.1
Downy mildew	1.0	4.9	4.1	9.0
Botrytis blight	0.2	1.0	1.2	2.2
Virus (TSWV, INSV, Hosta Virus X, rose rosette)	0.6	2.9	0.3	3.2
Minor diseases (rust, downy mildew, nematode)	0.6	2.9	1.1	4.0
Total (Ornamental production)	**9.4**	**46.0**	**27.5**	**73.5**

Production Category (2010 Farm Gate Value)	% Reduction in Crop Value[1]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Field Nursery ($77.99 M)	2.0	1.5	2.1	3.6
Container Nursery ($146.82 M)	8.3	12.2	11.9	24.1
Floriculture (Greenhouse) ($265.40 M)	12.2	32.3	13.5	45.8
Total (Ornamental production)	**9.4**	**46.0**	**27.5**	**73.5**

[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 excellent in 2014. Due to adequate fungicide programs, brown rot and scab diseases were of minimal consequence. 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 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	54.2	2,050.0	2,104.2
Scab	0.01	5.4	1,500.0	1,505.4
Bacterial Spot	0.01	5.4	30.0	35.4
Phony Peach	0.1	54.2	230.0	284.2
Gummosis	0.1	54.2	20.0	74.2
Armillaria Root Rot	1.0	542.3	50.0	592.3
Phomopsis Constriction Canker	0.01	5.4	10.0	15.4
Total	**1.3**	**721.3**	**3,890.0**	**4,611.3**
Estimated by Phil Brannen, Extension Plant Pathologist				

PEANUT

In 2014 peanut was reported harvested from 607,272 acres. Yields in 2014 averaged 4259 lb/A for a total production valued at $563.9 million. Conditions during the 2014 growing season were often hot and dry; conditions that both affected yield and also diseases.

Severity of tomato spotted wilt increased in 2013 for the first time in several years and then increased again in 2014. Though losses associated with spotted wilt were estimated to be only 3% in 2014, this was a 50% increase over estimated losses in 2013 (2%). Loss to spotted wilt in 2013 was an 8X increase from 2012.

Environmental conditions throughout much of the 2014 field season favored diseases like Aspergillus crown rot, a common early-season disease for peanut producers in Georgia, and white mold (stem rot). Outbreaks of white mold were more severe in 2014 than in 2013 because of warmer temperatures. Early and late leaf spot diseases were generally not a significant problem for most growers.

The peanut root-knot nematode remained a problem in the south-central and southwestern regions of the state. Losses to nematodes increased slightly as use of Temik 15G was greatly restricted. Development and spread of Cylindrocladium black rot (CBR) and was slight in 2014.

Disease	% Reduction in Crop Value[a]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($Millions)
Leaf spots	1.0	5.6	27.5[b]	33.1
White mold	4.0	22.6	14.4[c]	37.0
Limb Rot	0.25	1.4	---[d]	1.4
Pod Rot	trace	---	---[e]	---
Nematodes	3.0	16.9	4.5[f]	21.4
Cylindrocladium Black Rot	trace	---	---	---
Seedling Disease	0.5	2.8	---[g]	2.8
Tomato Spotted Wilt	3.0	16.9	---	16.9
Diplodia Collar Rot	trace	0	---	---
Total	**11.75**	**66.2**	**46.4**	**112.6**

a The total value of the crop was $563.9 million 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, prothioconazole, tebuconazole, or flutolanil to control soilborne diseases at some point during the season. For non-irrigated fields, four applications were calculated at $3/A. For irrigated fields, four applications at $9/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 $80/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 early part of the 2014 pecan season was wet due to frequent rainfall. The early rains lead to heavy scab pressure during leaf expansion. Although the number of rain events was lower during the nut development period, scab pressure remained a concern throughout the season. In University of Georgia fungicide trials in Tift County, non-treated controls of the cultivar 'Desirable' had nut scab severity ratings of 80.0% and 92.5% in early September. This level of scab on the fruit would result in a near 100% loss.

In 2014, pecan acreage was estimated to be 156,823 acres in Georgia with a total farm gate value of $313,313,250.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)[1]	Total ($ Millions)
Scab	10.0	3.1	22.6	25.7
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	10.0	3.1	22.6	25.7

[1] Twelve treatments on 156,823 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 2014 field season were generally hot and dry and very unfavorable for the development and spread of Asian soybean rust. Because threat from Asian soybean rust, Phakopsora pachyrhizi, 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 2014, soybeans were planted to a reported 289,742 acres with an average yield of 41.6 bu/A. The total soybean production for Georgia in 2014 was valued at $125.1 million.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Soybean cyst nematode[1]	0.1	0.1	---	0.1
Root-knot nematodes	4.0	5.0	0	5.0
Other nematodes[2]	0.25	0.3	---	0.3
Asian soybean rust	---	---	0.8	0.8
Anthracnose	0.25	0.3	0	0.3
Brown leaf spot	---	---	0	0
Charcoal rot	trace	---	0	0
Diaporthe/Phomopsis complex	---	---	0	0
Downy mildew	---	---	0	0
Frogeye leaf spot	trace	---	0	0
Red crown rot	trace	---	0	0
Pod and stem blight	2.0	2.5	0	2.5
Purple stain	trace	---	0	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	trace	---	0	0
Fusarium Wilt	---	---	0	0
Virus diseases	---	---	0	0
Bacterial diseases	---	---	0	0
Total	**7.0**	**8.6**	**0.9**	**9.5**

1 Resistant varieties are used to manage most nematode and disease problems; Temik 15G is generally no longer available. It is estimated that fungicides were applied to 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. It is estimated that each foliar fungicide application cost growers $15/A.
2 “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 2014. Botrytis (gray mold) was a limited issue, even though resistance to numerous fungicides was reported in multiple locations. Phytophthora, Pythium and Rhizoctonia root rots were sometimes damaging. Viral diseases, strawberry mild yellow edge and strawberry mottle, were virtually nonexistent in 2014, whereas they were prevalent in the prior year. Leaf scorch and anthracnose was observed in some locations. Overall, it was an excellent year for strawberry production. Relative to anthracnose, there is concern that the pathogen may be developing fungicide resistance. 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	0.1	9.3	621.0	630.3
Fungal Leaf Spots	0.1	9.3	193.2	202.5
Anthracnose	0.1	9.3	207.0	216.3
Root Rots & Nematodes	2.0	185.7	345.0	530.7
Angular Leaf Spot	0.0	0.9	13.8	14.7
Total	**2.3**	**214.5**	**1380.1**	**1594.6**
Estimated by Phil Brannen, Extension Plant Pathologist				

TURFGRASS

In 2014, it was estimated that there were 2.0 million acres of turf with a maintenance value of $1.88 billion in Georgia. There were 24,562 acres used for sod/stolons production in the state, yielding a farm gate value of $104,304,869. Extreme cold, freezing temperatures, as well as prolonged frozen ground occurred in the first quarter of the year. These conditions in combination with extended periods of rain and cloud coverage exerted harsh environmental problems on warm season grasses, affecting dormancy break, and green-up. Most affected grasses with these types of conditions were bermuda and centipede grasses. Therefore in 2014, environmental problems rather than diseases were the norm. Ophiosphaerella spp. (spring dead spot) affecting Cynodon spp. (bermudagrass) infections were extremely prevalent in the Piedmont and Blue Ridge areas of the state. Due to wet conditions, root rot problems either by saturated, anaerobic soils and/or Pythium were common in 2014. Bipolaris spp. and Drechslera spp were particularly problematic on bermudagrass and annual ryegrass during the spring and fall of 2014. Rhizoctonia solani infections on warm season grasses were ubiquitous early in the year. Sclerotinia homoeocarpa (dollar spot) was severe and widely 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. In general, cool-season grasses had only minor disease incidence and made it through 2014 without major problems. There were 447 turfgrass samples received at the UGA plant disease clinic during 2014, with the large majority of them from warm season grasses. 462 nematodes analysis were submitted to the UGA nematology laboratory from warm and cool-season swards.

Turf Diseases	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Soil-borne and Crown Diseases	3.2	60.2	47.0	107.2
Foliar Diseases	0.9	16.9	11.3	28.2
Nematodes	0.3	5.6	3.8	9.4
Total	**4.4**	**82.7**	**62.1**	**144.8**
Estimated by Alfredo Martínez-Espinoza, Extension Plant Pathologist				

VEGETABLES

About 150,000 acres of vegetables were grown in Georgia in 2014 worth a total of ca. $1.01 billion. The wet conditions during the spring and the mid-fall growing seasons, especially during harvest, exacerbated plant diseases. Phytophthora fruit rot (Phytophthora capsici), downy mildew (Pseudoperonospora cubensis) and anthracnose (Colletotrichum orbiculare) caused greater losses than normal in cucurbit crops. Fusarium wilt of watermelon (Fusarium oxysporum f. sp. niveum) caused considerable economic losses early in the season. Potyviruses also caused economic losses in squash crop planted in the fall. 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. The most prevalent disease on tomatoes and peppers again was bacterial spot, caused by Xanthomonas campestris pv. vesicatoria. New resistant bell pepper varieties are continuing to help reduce losses to bacterial spot. Other diseases in tomato including southern blight (Sclerotium rolfsii) and tomato yellow leaf curl also caused economic losses.

Major Vegetable Crops	**% Reduction in Crop Value[1]**	**Damage ($ Millions)**	**Cost of Control ($ Millions)**	**Total ($ Millions)**
Watermelon	12.0	16.2	7.0	23.2
Squash (yellow + zucchini)	5.0	2.5	3.0	5.5
Tomato	1.5	0.7	2.9	3.6
Other Vegetable Crops	**% Reduction in Crop Value[1]**	**Damage ($ Millions)**	**Cost of Control ($ Millions)**	**Total ($ Millions)**
Pepper (bell)	1.5	2.1	2.0	4.1
Cucumber	5.0	3.0	3.2	6.2
Snap Bean	1.0	0.2	1.3	1.5
Greens	1.5	0.8	1.7	2.5
Cabbage	1.8	1.0	0.9	1.9
Onion (dry)	2.5	2.4	3.8	6.9
Cantaloupe	2.5	0.6	2.6	3.2
Eggplant	0.5	0.1	0.4	0.5
Total	**3.4[1]**	**29.6**	**28.8**	**58.4**

[1] This column is not additive due to the way losses for vegetables are tabulated.

Estimated by F. Hunt Sanders, Jr., Disease Management Specialist

WHEAT

The farm gate value of wheat in 2014 in Georgia was $86,714,104. Wheat was harvested from 282,223 acres with an average yield of 58.56 bu/acre. The top five wheat-producing counties (by area) were Pulaski, Jefferson, Dooly, Sumter and Dodge. Moist and cooler temperatures in late January through mid-May lead to several disease issues. Fusarium Head Blight (FHB/Scab) was the single most important and devastating disease on wheat in 2014. Historically, FHB infections have been extremely low in Georgia. However, FHB incidence was widespread and throughout the state this season. In the southwestern part of the state, FHB was particularly severe in commercial fields and on University of Georgia research plots. At some experimental plots in the UGA Southwest Georgia Research and Education Center in Plains, FHB severity reached up to 50%. The cool, wet weather at the time of flowering provided conditions for FHB infections throughout the state. The economic losses from this disease were high. Powdery mildew (Blumeria graminis f. sp tritici) incidence was high in south Georgia in 2014. Many fields were treated early with fungicides due to high levels of infection. Stripe rust (Puccinia striiformis) and leaf rust (Puccinia triticina) infections were minimal. Stagonospora spot blotch, tan spot, wheat streak mosaic and barley yellow dwarf virus were observed throughout the state and seemed more prevalent than previous years. Soil borne mosaic virus was not an issue in the 2014 growing season.

Wheat Diseases	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Leaf Rust/Stripe Rust	0	0	0	0
Glume Blotch	0.1	0.1	0	0.1
Powdery Mildew	1.0	0.9	0.4	1.3
Fusarium Head Blight	5.0	4.3	0	4.3
Barley Yellow Dwarf Virus	0	0	0	0
Soilborne Wheat Mosaic /Spindle Streak Mosaic Virus	0	0	0	0
Total	**6.1**	**5.3**	**0.4**	**5.7**
Estimated by Alfredo Martinez-Espinoza, Extension Plant Pathologist				

SUMMARY OF TOTAL LOSSES DUE TO DISEASE DAMAGE AND COST OF CONTROL IN GEORGIA – 2014

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	12.6	4.1	0.54	0.31	0.85	6.7
Blackberry	5.46	2.7	0.15	0.78	0.93	17.0
Blueberry	335.25	5.2	17.4	13.2	30.6	9.1
Bunch Grape	6.24	13.6	0.98	0.31	1.29	20.7
Corn	264.77	14.9	39.3	6.6	45.9	17.3
Cotton	964.68	19.6	189.1	20.2	209.3	21.7
Muscadine Grape	6.24	3.5	0.23	0.15	0.38	6.0
Ornamentals	490.2	9.4	46.0	27.5	73.5	15.0
Peach	53.51	1.3	0.7	3.9	4.6	8.6
Peanut	563.94	11.8	66.2	46.4	112.6	20.0
Pecan	313.31	10.0	31.3	22.6	53.9	17.2
Soybean	125.07	7.0	8.6	0.9	9.5	7.6
Strawberry	15.82	2.3	0.2	1.4	1.6	10.1
Turfgrass	1984.3	4.4	82.7	62.1	144.8	7.3
Vegetable	1017.88	3.4	29.6	28.8	58.4	5.7
Wheat	86.72	6.1	5.3	0.4	5.7	6.6
TOTALS	**6245.99**	**---**	**518.3**	**235.51**	**753.85**	**12.07**

[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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