2007

Georgia Plant Disease Loss Estimates

Compiled by
Alfredo Martinez
Extension Plant Pathologist

Contents

2007 Georgia Plant Disease Loss Estimates

It is estimated that 2007 plant disease losses, including control costs, amounted to approximately **$539.74** million. The value of the crops used in this estimate was approximately **$4815.02** million, resulting in an **11.03** percent 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: Georgia Agricultural Statistics Service, Georgia Farm Report 8, No. 1 and the 2007 Georgia Farm Gate Value Report (AR-08-01). Some estimates for fruits, grapes, ornamentals, and turf rely on specialists' knowledge of the industry and industry sources for information.

The information in this publication was compiled by Alfredo Martinez, extension plant pathologist. The following members of the University of Georgia department of plant pathology made direct contributions to this publication:

Phil Brannen	Athens, GA	706-542-1250	pbrannen@uga.edu
Jason Brock	Tifton, GA	229-386-7495	jbrock@uga.edu
Robert Kemerait	Tifton, GA	229-386-7495	kemerait@uga.edu
David Langston	Tifton, GA	229-386-7495	dlangsto@uga.edu
Alfredo Martinez	Griffin, GA	770-228-7375	martinez@griffin.uga.edu
Holly Thornton	Athens, GA	706-542-8987	hthornto@uga.edu
Jean Williams-Woodward	Athens, GA	706-542-9140	jwoodwar@uga.edu

2007 Plant Disease Clinics Annual Summary

Extension Plant Pathology maintains two plant disease clinics as educational resources for county extension agricultural faculty to use to aid their clients in diagnosing and correcting disease-related plant problems. The Athens Plant Disease Clinic, which includes the Homeowner IPM plant disease clinic, is operated by Holly Thornton. The following plant disease samples are processed in Athens: commercial fruit, ornamentals, and turf; Christmas trees and forestry; all homeowner samples; legume forages and small grains; urban ornamental landscapes; and mushrooms and wood rots. There is a $10 processing fee for all physical homeowner samples submitted to the diagnostic clinic in Athens.

In Tifton, the Plant Disease Clinic is run by Jason Brock in the Horticulture Building on the main Tifton Campus — Room 116, 4604 Research Way. Diagnoses of and control recommendations for commercial samples of field crops, grain forages, pecans, and vegetables are handled at this location.

Compared to last year, sample numbers are up (the 2006 total was 1,288). A three-fold increase was seen in homeowner sample submission compared to 2006, while commercial sample numbers decreased marginally. Last year was a very dry year and many of the problems seen were not disease-related but rather were environmental- or cultural-type plant problems.

Diagnoses and educational recommendations are returned to the county faculty. The clinics maintain a computerized database of samples and their diagnoses through the DDDI system, as well as a reference library for use by extension agents, specialists, researchers, and students. Monthly homeowner reports are also available via our departmental clinic homepage (http://www.plant.uga.edu/Extension/Clinics/PDC.htm).

Clinic Summaries: 2007 Plant Sample Submission

Crop	Commercial Samples	Homeowner IPM Samples	Total
Field Crops	205	3	208
Vegetables	278	44	322
Fruits & Nuts	85	25	110
Herbaceous Ornamentals	62	33	95
Woody Ornamentals	115	77	192
Trees	82	72	154
Turf	254	160	414
Miscellaneous	18	17	35
Total	**1,099**	**431**	**1,530**

APPLE

Apple production was influenced by the "Easter freeze," but it was not reduced as dramatically as other fruit commodities. Due to extreme drought conditions, fire blight and summer rot diseases had a minimal impact. Overall disease pressure was very low in apples.

There is still a strong need for more efficacious fungicides for control of bitter rot and other summer rot diseases. In addition, though not yet observed, we are concerned that streptomycin antibiotic resistance may yet become an issue; currently, streptomycin is the only effective antibiotic for fire blight. If we lose this antibiotic due to resistance, apple production will be much more difficult. Cost of control includes 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	1.0	10.7	70.0	80.7
Bitter Rot	5.0	53.6	100.0	153.6
Bot Rot	0.1	1.1	52.0	53.1
Black Rot	0.1	1.1	33.0	34.1
Alternaria Leaf Spot	0.1	1.1	0.0	1.1
Powdery Mildew	0.1	1.1	11.5	12.6
Sooty Blotch	0.1	1.1	0.0*	1.1
Fly Speck	0.1	1.1	0.0*	1.1
Cedar Apple Rust	0.1	1.1	0.0*	1.1
Scab	0.05	0.5	0.0*	0.5
Other Diseases	0.05	0.5	1.0	1.5
Total	**6.8**	**73.0**	**267.5**	**340.5**

*Controlled with fungicides applied for other diseases.

Estimate by Phil Brannen, Extension Plant Pathologist

BLUEBERRY

Blueberry production in 2007 was largely decimated by the "Easter freeze." As a result, yields were off substantially. Southern highbush production was not impacted as greatly, but 80-90% of rabbiteye production was destroyed. Due to extreme drought conditions that followed, very few fungal diseases were observed. However, bacterial leaf scorch, a newly-identified bacterial disease of southern highbush blueberries, was observed in numerous locations throughout the blueberry belt. Also, the viral disease red ring spot was identified in several sites. Blueberry viruses had heretofore been occasionally-observed curiosities. With the realization that propagation was the likely source of viral spread, the need for better management of propagation material became more clearly obvious in 2007.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Mummy Berry	0.1	23.0	1,277.5	1,300.5
Botrytis Blight	0.1	23.0	511.0	534.0
Foliar Disease	0.1	23.0	383.3	406.3
Rots	0.1	23.0	127.8	150.8
Bacterial Scorch	0.01	2.3	0.0	2.3
Dieback	0.1	23.0	127.8	150.8
Phytophthora Root Rot	0.1	23.0	127.8	150.8
Total	**0.61**	**140.3**	**2,555.0**	**2,695.3**

Estimate by Phil Brannen, Extension Plant Pathologist

BUNCH GRAPE

Grape production was also dramatically reduced due to the "Easter freeze." Disease pressure from fungi was virtually nonexistent, largely as a result of a dry year. However, powdery mildew, a dry-weather pathogen, was prevalent in some locations. Pierce's disease losses were once again extensive in 2007. North Georgia is on the southern edge of the region where one can effectively grow wine grapes, and this is related to Pierce's disease — a bacterial disease that is vectored by an insect, the glassy-winged sharpshooter. Cold winter temperatures either kill the insect that transmits the disease or may actually prevent the bacteria from surviving, but the verdict is still out on which is most important. However, we do know that cold temperatures allow for production of vinifera wine grapes, and we do not recommend that producers plant these at elevations below 1,300 feet. As a result of warmer winters, we have observed substantial increases in vine death, even at higher elevations and longitudes. In some cases, producers have gone from losing less than ten vines per year to losses of several hundred vines, as observed in 2006 and 2007.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Botrytis	1.0	18.5	40.0	58.5
Downy Mildew	1.0	18.5	70.0	88.5
Black Rot	1.0	18.5	70.0	88.5
Powdery Mildew	1.0	18.5	20.0	38.5
Phomopsis Cane Blight	1.0	18.5	35.0	53.5
Crown Gall	0. 1	1.9	5.0	6.9
Pierce's Disease	1.0	18.5	30.0	48.5
Total	**6.1**	**112.9**	**270.0**	**382.9**

Estimate by Phil Brannen, Extension Plant Pathologist

CORN

In 2007, field corn was harvested from 463,503 acres in Georgia with an average yield of 133 bu/A. The 2007 crop was valued at $212,856,500. Southern corn leaf blight was of minor importance in 2007. Much of the 2007 crop season, especially the early season, was marked by extremely dry conditions. Southern rust, which was very important in 2003, was inconsequential in 2004, 2005, and 2006. Using fungicides to protect the corn crop is becoming more popular among growers both for disease control and hope that use of strobilurin fungicides may help to increase plant health. The true importance of damage from nematodes (e.g., sting, stubby root, and southern root-knot nematodes) is becoming more apparent as the acreage planted to corn in Georgia increases and as growers and county agents become more familiar with the symptoms.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Root & Stalk Rot	0.1	0.2	0.0	0.2
Nematodes	3.0	6.3	0.8	7.1
Mycotoxins	6.0	12.6	0.0	12.6
Leaf Diseases	0.5	1.0	0.2	1.2
Total	**12.1**	**12.4**	**0.5**	**21.1**

Estimate by Robert Kemerait, Extension Plant Pathologist

COTTON

In 2007, it was reported that cotton was harvested from 1,052,739 acres. The average lint yield was 851.7 lb/A. The crop was valued at $628,800,267. Conditions during the early part of the 2007 season were extremely dry. Losses to seedling disease, primarily Rhizoctonia seedling blight, or "soreshin," were a bit higher than expected since soil conditions were warm and dry at planting. Losses to nematodes, primarily southern root-knot nematodes, continue to be one of the most important problems for cotton growers in Georgia. Season-long drought during 2007 increased losses associated with damage from nematodes. Losses and damage from parasitic nematodes will continue to increase unless growers use nematicides effectively and until growers are able to practice effective crop rotation and increase the number of years between cotton crops in a field. Ascochyta blight was again of concern among growers in the southwestern region of Georgia in 2007; however, it appears that losses to this disease were minimal. Stemphylium leaf spot was of particular importance in some areas of the state as a result of nutritional deficiencies in the leaves (primarily potassium) due to poor uptake in dry conditions.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Boll Rot (lint)	1.0	6.3	0.0	6.3
Nematodes	8.0	50.2	10.5[a]	60.7
Southern Root-knot	6.0	37.7	---	---
Reniform	1.5	9.4	---	---
Columbia Lance	0.5	3.1	---	---
Seedling Disease	2.0	12.6	1.7[b]	14.3
Fusarium Wilt	Trace	---	---	---
Ascochyta Blight	Trace	---	---	---
Stemphylium Leaf Spot	2.0	12.6	---	12.6
Total	**19.0**	**81.7**	**12.2**	**93.9**

[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), 25% with AVICTA Complete Pak. Approximately 2% of the acreage was treated with Telone II.

[b] This figure is an estimate of the cost of fungicides, both in the seed treatments and additional hopper box and in-furrow applications, 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 seed treatment to manage seedling disease.

Estimate by Robert Kemerait, Extension Plant Pathologist

MUSCADINE GRAPE

Minimal disease pressure was observed in most muscadine vineyards due to extreme drought. Some losses continued to occur from "dead arm" diseases, but in general, disease losses were minimal.

Disease	% Reduction in Crop Value	Damage ($ Thousands)	Cost of Control ($ Thousands)	Total ($ Thousands)
Bitter Rot	0.1	1.8	40.2	42.0
Macrophoma Rot	1.0	17.6	35.0	52.6
Ripe Rot	0.1	1.8	15.0	16.8
Angular Leaf Spot	0.1	1.8	5.0	6.8
Black Rot	0.1	1.8	0.0*	1.8
Phomopsis Dead Arm	0.1	1.8	1.0	2.8
Total	**1.5**	**26.5**	**96.2**	**122.7**

*Controlled with fungicides applied for other diseases.

Estimate by Phil Brannen, Extension Plant Pathologist

ORNAMENTALS

The 2007 farm gate value for ornamental horticulture (excluding turf) was estimated at $606.23 million. Landscape, re-wholesale, and retail (i.e. service) industries are estimated to account for an additional $1.8 billion, for a total ornamental industry value-added estimate of $2.41 billion. Disease loss estimates were generated for only 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 is reported and used to develop the loss estimate.

Losses due to plant diseases were reduced from 2006 values, most likely due to drought conditions throughout much of the year. Root rot diseases still account for the largest percentage of disease loss in commercial ornamental production. Drought and heat stress within containers contributed to additional root rot loss. Downy mildew and needle blight continue to increase in occurrence and in cost of control due to additional fungicide inputs and labor costs.

Disease (Ornamental production)	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Bacterial Diseases (Fire Blight, Leaf Spots)	0.4	2.42	0.8	3.22
Fungal Leaf Spots, Stem Cankers, Needle Blights	1.5	9.09	6.5	15.59
Root and Crown Rots	3.0	18.19	8.2	26.39
Powdery Mildew	0.5	3.03	1.8	4.83
Botrytis Blight	0.2	1.21	1.2	2.41
Virus (Tswv, Insv, Hosta Virus X)	0.2	1.21	0.1	1.31
Minor Diseases (Rust, Downy Mildew, Nematode)	1.0	6.06	2.6	8.66
Total (Ornamental Production)	**6.8**	**41.22**	**21.2**	**62.42**

Production Category (2007 Farm Gate Value)	% Reduction in Crop Value[1]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Field Nursery ($101.11 M)	3.0	3.03	2.1	5.13
Container Nursery ($215.13 M)	13.1	28.08	10.2	38.28
Floriculture (Greenhouse) ($268.77 M)	3.8	10.11	8.9	19.01
Total (Ornamental Production)	**6.8**	**41.22**	**21.2**	**62.42**

[1]Column is not additive because disease losses are weighted according to production category.

Estimate by Jean Williams-Woodward, Extension Plant Pathologist

PEACH

Peach production was dramatically reduced as a result of the 2007 "Easter freeze." The severity of this freeze damaged young fruit in many varieties. Production was variable throughout the state, but the peach crop ranged from 10-60% of average, depending on location. Due to extremely dry conditions, brown rot and scab diseases were of minimal consequence on the fruit that remained. Likewise, bacterial diseases were of minimum consequence. Phony peach was observed to a higher degree, and this might have been a result of previous warm winters that influenced either vector and/or bacterial survival in plants. 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	10.0	1,750.0	1,760.0
Scab	0.01	1.0	1,110.0	1,111.0
Bacterial Spot	0.01	1.0	20.0	21.0
Phony Peach	0.5	50.0	230.0	280.0
Gummosis	0.1	10.0	20.0	30.0
Armillaria Root Rot	1.0	100.1	50.0	150.1
Phomopsis Constriction Canker	0.05	5.0	10.0	15.0
Total	**1.8**	**177.1**	**3,190.0**	**3,367.1**

Estimate by Phil Brannen, Extension Plant Pathologist

PEANUT

In 2007, peanuts were harvested from approximately 520,000 acres. Yields in 2007 averaged 3,150 lb/A for a total production valued at $324,324,000. Growing conditions were generally hot, dry and unfavorable for production during much of the growing season; however, the average final yield for the state was very good. Fortunately for peanut producers, tomato spotted wilt was very light in 2007 for reasons that remain unclear. Severity of spotted wilt was much lower in both 2006 (2.5% estimated reduction in crop value) and in 2007 than in 2005. Warm soil conditions in the 2007 season favored the development of white mold, which was the most important peanut disease for Georgia last year. Early and late leaf spot diseases were a problem for some growers; however, dry conditions slowed the spread of these diseases. Leaf spot diseases are often more severe in fields where peanuts are planted on a short rotation. Dry weather helped reduce the overall severity of leaf spot diseases in 2007.

Disease	% Reduction in Crop Value[a]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($Millions)
Leaf spots	1.0	3.2	24.4[b]	27.6
White mold	10.0	32.3	12.1[c]	44.4
Limb Rot	1.0	3.2	---[d]	3.2
Pod Rot	0.5	1.6	---[e]	1.6
Nematodes	3.0	9.7	3.9[f]	13.6
Cylindrocladium Black Rot	1.0	3.2	0.3[g]	3.5
Seedling Disease	0.2	0.6	0.5[h]	1.1
Tomato Spotted Wilt	1.5	4.9	0.0	4.9
Diplodia Collar Rot	Trace	---	0.0	0
Total	**18.2**	**58.7**	**41.2**	**99.9**

[a] The total value of the crop was $324.3 million, according to the National Agricultural Statistics Service.

[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 four-to-five 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.

[d] The 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 15% of the acreage in Georgia is treated at a cost of $50/A.

[g] It was estimated that approximately 1% of the total peanut acreage is treated with metam sodium to control CBR at $50/A.

[h] It was estimated that the cost to treat seed with fungicides is about $0.50/A, and that approximately 5% of the peanut acreage is treated with an in-furrow fungicide at planting at $10/A.

Estimate by Robert Kemerait, Extension Plant Pathologist

PECAN

The 2007 pecan season was extremely dry, resulting in conditions unfavorable for disease development. There were no confirmed reports of leaf scab. The nut scab that occurred was the result of infections late in the growing season, with little-to-no loss occurring.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)[1]	Total ($ Millions)
Scab	0.05	0.64	17.4	18.04
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	**0.05**	**0.64**	**17.4**	**18.04**

[1] Seven treatments on 137,901 acres at $18.00/A. Scab sprays were also effective against anthracnose, downy spot, brown spot, and powdery mildew in most cases. The number of sprays varied by location.

Estimate by Jason Brock, Extension Plant Pathologist

SOYBEAN

The recurrence of soybean rust, *Phakopsora pachyrhizi,* in Georgia was the most important disease issue for soybean producers in 2007, although the disease caused little yield loss. This can be attributed to the slow development of the disease because of very dry conditions during the 2007 season and because much of the acreage planted to soybeans, especially in the southern part of the state, was treated with fungicides. Asian soybean rust was found to successfully survive the early part of the winter of 2006-2007 on protected patches of kudzu in southern Georgia (for example, in Miller, Grady, Thomas, and Brooks Counties). However, unusually cold weather in late February killed all known remaining kudzu in the state. Asian soybean rust was not detected again in the state until mid-July in Brooks and then Tift Counties. The most important spread of Asian soybean rust into commercial areas occurred in late August and early September. It is estimated that at least 70 percent of the growers in Georgia applied at least one fungicide spray for the management of this disease. In 2007, soybean was harvested from an estimated 274,751 acres with an average yield of 33 bu/A. The total soybean production for Georgia in 2007 was valued at $69,364,553. Charcoal rot, caused by *Macrophomina phaseolina,* was more common in the state than usual because of the drought-like conditions. Frogeye leaf spot was fairly common but was relatively unimportant for most growers. Nematodes remain an important problem for soybean in Georgia, especially in fields rotated with corn or cotton.

Disease	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Anthracnose	0.5	0.3	0	0.3
Brown Leaf Spot	Trace	---	0	0.0
Charcoal Rot	2.0	1.4	0	1.4
Diaporthe/Phomopsis Complex	Trace	---	0	0.0
Downy Mildew	0	0	0	0.0
Frogeye Leaf Spot	0.1	0.1	0	0.1
Red Crown Rot	Trace	---	0	0.0
Pod & Stem Blight	Trace	---	0	0.0
Rhizoctonia Aerial Blight	0	0	0	0
Seeding Disease	Trace	---	0	0
Southern Blight	Trace	---	0	0
Soybean Cyst Nematode	0	0	0	0
Root-knot	3	2.1	0	2.1
Other Nematodes[1], Reniform, Columbia Lance	1	0.7	0	0.7
Asian Soybean Rust	1	0.7	1.9	2.6
Total	**7.6**	**5.3**	**1.9**	**7.2**

[1] Resistant varieties are used to manage most nematode and disease problems. Typically, the only fungicides used are seed treatments to reduce seedling diseases.

Estimate by Robert Kemerait, Extension Plant Pathologist

STRAWBERRY

Disease pressure was not severe in 2007, since it was a relatively dry year. Angular leaf spot was minimally observed. Anthracnose and Botrytis (gray mold) diseases, though infrequently observed, were not prevalent due to adequate control afforded through use of multiple fungicides throughout fruit development. Overall, it was a very good year for strawberry production. There is some concern that the strobilurin fungicides, which are heavily and virtually exclusively utilized for control of anthracnose, may be developing resistance. One site was tested for strobilurin fungicide resistance relative to the anthracnose pathogen, but none was found. 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	0.5	40.0	306.2	346.2
Fungal Leaf Spots	0.5	40.0	95.3	135.3
Anthracnose	1.0	80.1	102.1	182.2
Root Rots & Nematodes	1.0	80.1	170.1	250.2
Angular Leaf Spot	1.0	80.1	9.7	89.8
Total	**4.0**	**320.3**	**683.4**	**1,003.7**

Estimate by Phil Brannen, Extension Plant Pathologist

TURFGRASS

It is estimated that there are 1.97 million acres of turf with a maintenance value of $1.80 billion in Georgia. In 2007, an historic drought had a detrimental effect on the turfgrass industry. Drought also impacted disease incidence, and stressed turf swards were ubiquitous. High incidences of *Curvularia* spp. and *Colletotrichum* spp. were common in warm season grasses. Soilborne diseases were responsible for much of the disease losses. *Gaeumannomyces* spp. (causal agent of take-all root rot and Bermuda decline) continues to be prevalent and was observed throughout the state, with higher incidences of the disease in the coastal and southern areas of Georgia. St. Augustinegrass, Bermuda, and centipede were the most affected species. In 2007, *Gaeumannomyces* spp. was commonly diagnosed at our Plant Disease Clinics. *Rhizoctonia* spp. (causal agent of brown patch, large patch, and yellow patch) was prevalent. *Pythium* spp. was observed throughout the state in 2007, especially in bentgrass green. Drought stress and unusually high temperatures yielded poor root development in bentgrass greens and made them prone to root-infecting pathogens. Incidences of *Magnaporthe poae* (summer patch) and *Ophiosphaerella* spp. (spring dead spot) were common in 2007. Foliar diseases continue to be problematic in 2007. *Sclerotinia homoeocarpa* was present throughout the state and in several turfgrass species. *Pyricularia grisea* infections were registered in 2007 as being prevalent in south and coastal Georgia. *Bipolaris* spp. was particularly problematic on Bermuda during the fall. Nematodes have been attributed to increased damage and promoting stress on turfgrass. Mixed infections of nematodes and *Pythium* were common in 2007.

Turf Diseases	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Soil-borne Diseases	3.3	59.4	32.4	91.8
Foliar Diseases	1.2	21.6	19.8	41.4
Nematodes	2.5	45.6	9.0	54.6
Total	**7.0**	**126.6**	**61.2**	**187.8**

Estimate by Alfredo Martinez, Extension Plant Pathologist

VEGETABLES

In 2007, about 170,000 acres of vegetables worth a total of approximately $894 million were grown in Georgia. Overall, most crops suffered few losses due to the drought, which resulted in unfavorable conditions for most diseases. 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. A new race of powdery mildew was observed on cantaloupe and caused severe yield reductions in some fields. The most prevalent disease on tomatoes and peppers was bacterial spot, caused by *Xanthomonas campestris* pv. *vesicatoria.* This disease continues to plague growers because it is difficult to prevent, and remedial disease management tools are generally suppressive at best. Due to the cool, dry fall, however, losses to bacterial spot were low again.

Major Vegetable Crops	% Reduction in Crop Value[1]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Watermelon	2.3	2.4	5.3	7.7
Squash (yellow + zucchini)	2.3	0.92	1.3	2.22
Tomato	2.8[1]	1.3	2.8	4.1

Other Vegetable Crops	% Reduction in Crop Value[1]	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Pepper (bell)	4.2	4.2	1.9	6.1
Cucumber	2.5	2.1	1.6	3.7
Snap Bean	3.0	0.9	1.3	2.2
Greens	2.0	1.2	1.2	2.4
Cabbage	2.0	0.8	0.6	1.4
Onion (dry)	2.0	3.2	2.3	5.5
Cantaloupe	3.0	0.7	2.0	2.7
Eggplant	3.0	0.36	0.3	0.66
Total	**2.5[1]**	**18.1**	**20.6**	**38.7**

[1] This column is not additive due to the way losses for vegetables are tabulated. Total values for vegetable commodities are taken from the 2007 farm gate values (AR-08-02).

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

WHEAT

Wheat was harvested from 286,571 acres with an average yield of 50 bu/Acre. The farm gate value of wheat in 2007 was $61,889,659. Acreage planted in 2007 accounted for an increase of 78% compared to 2006. Early infections of *Blumeria graminis f. sp tritici* (powdery mildew) were registered in the southern part of the state. Powdery mildew disease pressure was high on wheat research plots in Tifton. Weather conditions ultimately held the disease in check. Presence of *Puccinia striiformis* (stripe rust) was registered in 2007 in the southern part of the state and the potential for an epidemic was averted with warmer temperatures observed in the second week of March. The relatively cool and dry grain-filling period of April held *Puccinia recondita* (leaf rust) back in wheat critical physiological stages. *P. recondita* increased late in the season but had no effect on yield. Freezing temperatures were observed in April, causing widespread damage to heading and flowering wheat. *Fusarium* spp. (causal agent of fusarium foot rot) and *Gaumannomyces graminis var tritici* (take-all) were sporadically found in central and south Georgia and may have contributed to the early decline of some fields. *Stagonospora* (glume blotch on heads and leaves) incidence was low in 2007. Minor incidences of loose smut caused by *Ustilago tritici* were observed in localized areas. Some soil moisture and cooler temperatures in late winter encouraged soilborne mosaic virus to develop throughout the state. Barley Yellow Dwarf Virus (BYDV) was variable throughout the state, with low amounts observed in south Georgia. The research plots located at the Calhoun research center, which usually has the highest BYDV in the state, had only traces of BYDV in 2007. An important piece of the disease management strategies was the use of disease-resistant cultivars in 2007.

Wheat Diseases	% Reduction in Crop Value	Damage ($ Millions)	Cost of Control ($ Millions)	Total ($ Millions)
Leaf Rust	0.1	0.06	1.2	1.26
Glume Blotch	0.1	0.06	---	0.06
Powdery Mildew	1.0	0.62	0.3	0.92
Barley Yellow Dwarf Virus	0.4	0.25	0.3	0.55
Stinking/Loose Smut	---	---	---	----
Total	**1.6**	**0.99**	**1.8**	**2.79**

Estimate by Alfredo Martinez, Extension Plant Pathologist

Summary of Total Losses Due to Disease Damage and Cost of Control in Georgia 2007

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	4.35	6.8	0.073	0.267	0.340	7.8
Blueberry	48.56	0.61	0.140	2.555	2.695	5.5
Bunch Grape	1.86	6.1	0.112	0.270	0.382	20.5
Corn	212.85	12.1	12.4	0.5	21.1	6.06
Cotton	628.80	19.0	81.7	12.2	93.9	14.93
Muscadine Grape	1.43	1.5	0.026	0.096	0.123	8.53
Ornamental	606.0	6.8	41.22	21.2	62.42	10.30
Peach	36.30	1.8	0.177	3.19	3.367	9.27
Peanut	324.32	18.2	58.7	41.2	99.9	30.80
Pecan	121.4	0.05	0.64	17.4	18.04	14.85
Soybean	69.36	7.6	5.3	1.9	7.2	10.38
Strawberry	3.91	4.0	0.320	0.683	1.003	25.65
Turf	1,800.0	7.0	126.6	61.2	187.8	10.43
Vegetable	894.0	2.5	18.1	20.6	38.7	4.29
Wheat	61.88	1.6	0.99	1.8	2.79	4.50
Totals	**4,815.02**	**---**	**346.49**	**185.06**	**539.74**	**11.03**

[1] This column is not additive.

[2] Total % loss for each crop and the grand total is figured on the basis of: $\frac{\text{Value of Damage + Cost Control}}{\text{Crop Value}}$

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 reach of children.**
3. Use pesticides at correct label dosage and intervals to avoid illegal residues or injury to plant 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 and 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 Office, identify actions that may threaten endangered species or their habitat.

Trade names are used only for information.

Special Bulletin 41-10 **Reviewed August 2014**