Southern United States Soybean Disease Loss Estimates for 2024

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The Southern Soybean Disease Workers (SSDW) have published soybean disease loss estimates for the southern United States since 1974. Summaries of the results from between 1977 and 2019 have been published in numerous refereed scientific journals (8; 12; 17; 19-28; 30-31). The annual losses from between 2015 and 2024 have been presented annually in the SSDW proceedings (1-7; 9-11) and most recently in a publication that included the estimates from 2015 to 2019 in Plant Health Progress that includes the loss estimates from the entire soybean production region including the southern and northern states for a total of 29 states and Ontario, Canada (12). A website through the University of Illinois Extension Service summarizes the estimated yield losses from both the northern and southern U.S. and includes data from 1996 through 2014. The website can be accessed at:

http://extension.cropsci.illinois.edu/fieldcrops/diseases/yield_reductions.php

The additional supporting presentation of loss estimates were included in the annual proceedings of the SSDW as well as some university-related sources (13-16; 18; 29). One last new output source has been at the Crop Protection Network where a soybean disease loss calculator uses data from 1996 through 2023 to provide information related to the percent losses, total bushels lost to disease and specific diseases, loss in dollars, and the potential losses on a per acre basis. The disease loss calculator can be accessed at:

https://loss.cropprotectionnetwork.org/crops/soybean-diseases

The disease loss estimates for the 2024 season contained in the current proceedings document were obtained from representatives across the southern U.S. through various methods. Plant pathologists with soybean pathology responsibilities were queried to provide the estimates of loss from their respective states in November 2024. Most individuals relied on multiple methods to derive estimates. Methods to derive losses included: Field surveys, plant disease diagnostic clinic samples, variety trials, questionnaires to Cooperative Extension staff, research plots, grower demonstrations, private crop consultant reports, foliar fungicide trials, sentinel plot data, variety trial ratings, and "pure guess". To complete the loss estimates for each state, USDA/NASS

production figures were downloaded in January 2025 and production losses were calculated based on estimates of yield in the absence of disease. One additional topic that has recently been included to the presentation of the loss estimates (2018 through 2024) has been a general environmental comparison from each state. However, one major change was made related to those data since the 2022 season in that all of the weather station locations were changed to a location collecting weather data from each state's greatest soybean producing county/parish. In situations where the greatest county/parish did not contain a weather station that recorded data the next greatest county/parish was used. Soybean county data were gathered from the USDA Farm Service Agency (FSA) website (https://www.fsa.usda.gov/news-room/efoia/electronic-reading-room/frequently-requested-information/crop-acreage-data/index). The data set from 2024 was parsed to determine the greatest counties in each state and irrigated and non-irrigated acres were added up to arrive at those totals. Environmental data from each county were then collected from the National Centers for Environmental Information (https://www.ncdc.noaa.gov/cdo-web/) by conducting searches within each state and downloading the entire data set for temperature and precipitation from each corresponding location. State, county/parish, total number of acres within each county/parish, and designated weather station name are presented in Table 1. Environmental data representing the most current 30-year normal (1981-2010) were downloaded for each corresponding location from the National Centers for Environmental Information data tools which includes climate normal (https://www.ncdc.noaa.gov/cdo-web/datatools/normals).

Production losses associated with disease severity estimates were based on the formula used to derive production losses:

Potential production without disease loss = actual production ÷ (1-percent loss) (decimal fraction)

Rounding errors may occur in the tables provided below due to the presence of low levels of disease estimated by the state pathologist. Total losses in the form of percent disease loss by state and total losses in millions of bushels were determined by averaging the loss by state with the inclusion of the trace estimates.

The 2024 total acres harvested, average yield (bushels/Acre), and total production (yield in bushels) from each state are presented in Table 2. Soybean acreage in the 16 southern states increased in 2024 when compared to the 2023 acreage reported by 5.4% (1). In general, 11 of the southern states reported an increase in the harvested acres, while five states reported decreases. The 2024 average per acre soybean yield was 42.5 bu/A, which was a 1.8% decrease compared to the average yield from 2023. Two states, Arkansas and Georgia, reported record yield. As a result of harvested acres having increased during 2024, nine states reported an increase in the overall yield in bu/A reported from the entire state. Four states (Louisiana, Missouri, North Carolina, and North Carolina) reported an increase in average yield compared to the yield recorded during the 2023 season. In 2024, more than 968 million bushels were harvested from approximately 20.3 million acres from the 16 southern states accounting for a 4% increase in the total harvest compared to 2023.

Percentage loss estimates from each state are specific as to causal organism or the common name of the disease (Table 3). The total estimated average percent disease loss for 2024 was greater

than the estimated loss observed during 2023 by 0.2%. As a whole, ten states reported an increase in percent disease losses compared to 2023 (AL, AR, DE, FL, KY, LA, MD, MO, MS, and NC). The remainder of the 16 states, six, reported a reduction in percent loss estimates ranging from 0.4% (in GA) to 4.03% (in OK). In terms of the top five diseases encountered during 2024, root-knot nematode, soybean cyst nematode (SCN), Cercospora leaf blight, reniform nematode, and charcoal rot were estimated to be the top five in order or importance. The same top five diseases were also the estimated to be the same for the 2023 season, the only main difference being that Cercospora leaf blight moved up to third place, and the reniform nematode moved up to fourth place, with charcoal rot dropping to the fifth place for the 2024 season. Breaking the diseases evaluated into categories based on specific plant parts impacted by the diseases within the survey resulted in four categories: Nematode diseases (59%), stem and root diseases (18%), foliar diseases (14%), seedling diseases (5%), and seed diseases (5%). Breaking the diseases down into categories of plant parts impacted helps highlight the importance of specific groups of diseases and which disease areas are causing the greatest estimated losses in a given year/season. Diseases included in the category "other diseases" could not be separated into separate categories and therefore were not included in any single category.

In terms of the disease losses in millions of bushels, the 2024 disease losses accounted for an estimated 59.3, a 16.7% increase compared to the estimated losses incurred during 2023 (Table 4).

Overall, the environmental conditions encountered during 2024 were extremely dry and somewhat warmer than normal across the southern region during June and July (Table 5). In general, a greater number of states recorded reductions in total rainfall over the course of 2024 when compared to the 30-year norm. In all, 12 states recorded negative rainfall totals for 2024 with rainfall totals being more than 44 inches below normal across the region. The decrease accounted for an 4.2% decrease in total rainfall across the region when compared with the 30-year norm. Total rainfall varied greatly by state with 12 states (AL, AR, DE, FL, KY, MD, MS, NC, OK, TN, TX, and VA) recording overall reductions during 2024 when compared with the 30-year normal by between -1.6 inches (NC) and -10.3 inches (in DE and MD). The remainder of the states, GA, LA, MO, and SC recorded increases in rainfall compared to the 30-year norm that ranged from 0.3 (LA) to 12.9 (GA). In addition, temperature for 2024 was also compared to the 30-year normal (1981-2010) at each of the locations. In general, looking across the entire year, based on temperature averages for the whole year, three months, January, July, and September were below the 30-year normal temperatures across the region. Conversely, the remainder of the months had temperatures above normal with the greatest temperature increases in February (5.8°F) and October (4.5°F). Looking at temperature data by month, nine months had average temperature increases.

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Table 1. Locations where environmental data were downloaded based on the county/parish in each state with the greatest soybean production and a town within that county that contained environmental data for the 2024.

State	County/Parish [a]	Location	2024 Acres of soybean production [b]	Specific weather station [c]
Alabama	Limestone	Athens	43,275	Athens
Arkansas	Mississippi	Keiser	184,219	Keiser
Delaware	Sussex	Georgetown	40,153	Georgetown Delaware Coastal Airport
Florida	Escambia	Pensacola	3,169	Pensacola Regional Airport
Georgia[d]	Laurens	Dublin	4,835	Dublin 2
Kentucky[e]	Graves	Mayfield	103,272	Mayfield
Louisiana[f]	Madison	Tallulah	88,860	Tallulah Vicksburg Regional Airport
Maryland	Queen Anne	Stevensville	45,278	Stevensville 2 SW
Mississippi	Bolivar	Cleveland	241,440	Cleveland
Missouri[g]	Conception	Nodaway	145,703	Sikeston Power Station
North Carolina	Robeson	Lumberton	80,874	Lumberton
Oklahoma	Kay	Blackwell	105,038	Blackwell 4 SSE Mesonet
South Carolina	Florence	Florence	39,629	Florence Regional Airport
Tennessee	Gibson	Milan	128,544	Milan Experimental Station
Texas	Lamar	Paris	21,554	Paris
Virginia[h]	Hanover	Hanover	17,789	Ashland Hanover Co. Municipal Airport

[a] County or parish soybean production data from each of the greatest soybean producing counties/parishes were determined based on data provided from the crop acreage data set from the USDA Farm Service Agency (www.fsa.usda.gov). Note that a weather station could not be located in the greatest soybean producing county/parish in Louisiana, Maryland, Missouri, or Virginia. The third largest soybean producing parish in Louisiana, 18th largest soybean producing county in Maryland, and the third largest in Missouri and Virginia were therefore relied on for environmental data.

[b] The total soybean acres produced in each county were determined based on FSA data and were added in instances where soybean production was separated based on irrigation practice, seed production, or the production of edamame.

[c] Specific weather station names are included for the purposes of presenting a historical record of these data as downloaded from the National Centers for Environmental Information website (www.ncdc.noaa.gov). In addition, weather stations were chosen that included a 30-year normal data set so comparisons could be made between 2024 and the normal environmental data. The specific weather station was based on the name assigned by NASS and can be located on their website.

[d] Laurens County, GA was the fourth largest soybean producing county.

[e] The data for the location in Kentucky were downloaded from http://kymesonet.org/monthly_summaries.html. The Kentucky mesonet site was the only one that included temperature as well as precipitation data.

[f] Madison Parish, LA was the second largest soybean producing parish.

[g] Nodaway County, MO was the third largest soybean producing county.

[h] Hanover County, VA was the seventh largest soybean producing county.

Table 2. Soybean production from the 16 southern states during 2024 [a].

State	Acres (1,000s) [b]	Bu/Acre [b,c]	Yield in bu/A (1,000s) [b]
Alabama	350 (+)	31 (-12)	10,850 (-)
Arkansas	3,020 (+)	55* (+1)	166,100 (-)
Delaware	153 (+)	45 (-1)	6,885 (+)
Florida	17 (-)	42.5 (-0.5)	754 (-)
Georgia	162 (+)	47 (+4)	7,614 (+)
Kentucky	2,040 (+)	48 (-7)	97,920 (-)
Louisiana	1,060 (+)	52 (+12)	55,120 (-)
Maryland	485 (+)	44 (-3)	21,340 (-)
Mississippi	2,270 (+)	56 (.)	127,120 (+)
Missouri	5,840 (+)	49 (-1)	286,160 (+)
North Carolina	1,610 (-)	39 (+0.5)	62,790 (+)
Oklahoma	405 (-)	20 (-6)	8,100 (-)
South Carolina	380 (-)	34 (-5)	12,920 (-)
Tennessee	1,800 (+)	42 (-9)	75,600 (-)
Texas	77 (-)	32 (+7)	2,464 (+)
Virginia	600 (+)	44 (-6)	26,400 (+)
TOTAL	**20,269 (+)**		**968,137 (+)**
		Avg. 42.5 (-0.8)	

[a] Data were compiled from the USDA National Agricultural Statistics Service Crop Production 2024 Summary as distributed in January 2025. The report, in its entirety, can be downloaded from: https://downloads.usda.library.cornell.edu/usda-esmis/files/k3569432s/ns065v292/8910md644/cropan24.pdf.
Additional data were supplemented for states such as Florida by using the FSA acres information which can be accessed at: https://www.fsa.usda.gov/news-room/efoia/electronic-reading-room/frequently-requested-information/crop-acreage-data/index

[b] Difference from 2023 indicated in parentheses as either a decrease (-) or increase (+).

Table 3. Estimated percentage loss of soybean yield due to diseases from 16 southern states during 2024.

	% yield suppression by state																
Disease	**AL[a]**	**AR**	**DE**	**FL**	**GA**	**KY**	**LA**	**MD**	**MO**	**MS**	**NC**	**OK**	**SC**	**TN**	**TX**	**VA**	**AVG**
Anthracnose	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.01	0.00	0.00	**0.01**
Bacterial diseases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.00**
Brown stem rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Cercospora leaf blight	1.00	0.20	0.00	0.50	0.50	0.10	0.80	0.00	0.01	1.20	0.05	0.20	0.50	0.10	0.00	0.00	**0.32**
Charcoal rot	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.05	0.00	0.05	3.00	0.01	0.05	0.00	0.00	**0.20**
Downy mildew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Frogeye leaf spot	0.40	0.50	0.00	0.00	0.00	0.80	0.10	0.00	0.00	0.00	0.08	0.00	0.01	1.20	0.00	0.00	**0.19**
Fusarium wilt and root rot	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	**0.01**
Other diseases[b]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.00**
Phomopsis seed decay	0.00	0.01	0.01	0.10	0.10	0.90	0.00	0.01	0.01	0.01	1.00	0.01	0.30	0.10	0.00	0.00	**0.16**
Phytophthora root and stem rot	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.50	0.00	0.01	0.00	0.00	0.05	0.00	0.00	**0.07**
Pod and stem blight	0.00	0.00	0.00	0.10	0.50	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.50	0.05	0.00	0.00	**0.08**
Purple seed stain	0.03	0.03	0.05	0.01	0.10	0.70	0.10	0.05	0.01	0.04	0.08	0.03	0.10	0.10	0.00	0.00	**0.09**
Red crown rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	**0.01**
Reniform nematode	0.30	0.40	0.00	1.00	0.10	0.00	2.00	0.00	0.00	0.20	0.00	0.00	0.50	0.01	0.00	0.00	**0.28**
Root-knot nematode	2.00	4.20	2.00	4.00	2.00	0.00	2.00	2.00	0.00	2.00	1.50	0.00	2.50	0.01	0.00	0.20	**1.53**
Soybean cyst nematode	0.05	0.20	3.00	0.00	0.00	2.90	0.00	3.00	3.50	0.05	0.10	0.00	0.30	2.10	0.00	0.40	**0.98**
Lesion nematode	0.00	0.01	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	**0.04**
Other nematodes[c]	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	**0.14**
Rhizoctonia aerial blight	0.02	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	**0.01**
Sclerotinia stem rot (white mold - *Sclerotinia sclerotiorum*)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Seedling diseases	0.04	0.04	0.00	0.00	0.00	0.60	0.00	0.00	0.20	0.40	0.50	0.01	0.02	1.00	0.00	0.00	**0.18**
Septoria brown spot	0.02	0.05	0.05	0.00	0.01	0.20	0.00	0.05	0.00	0.10	0.50	0.02	0.10	1.00	0.00	0.00	**0.13**
Southern blight	0.50	0.00	0.00	0.03	0.10	0.00	0.00	0.00	0.00	1.25	1.00	0.00	0.20	0.00	0.00	0.00	**0.19**
Soybean rust	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Stem canker	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.05	0.00	0.50	0.00	0.00	0.00	0.00	0.00	**0.05**
Sudden death syndrome	0.00	0.01	0.00	0.00	0.00	0.90	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.01	0.00	1.00	**0.18**
Taproot decline	0.05	0.05	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.80	0.00	0.00	0.01	0.00	0.00	0.00	**0.10**
Target spot	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.50	0.00	0.15	0.05	0.00	0.00	**0.05**
Virus Diseases[d]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.00	0.00	0.00	**0.00**
Total disease %	**4.43**	**5.70**	**5.11**	**5.96**	**3.62**	**8.06**	**5.78**	**5.11**	**5.36**	**6.10**	**5.97**	**3.27**	**7.88**	**5.83**	**0.00**	**1.60**	**4.99**

[a] Rounding errors may exist since some numbers presented carry decimal places beyond the hundredths place.
[b] Other diseases listed included: none listed for 2024.
[c] Other nematodes listed included: Columbia lance nematode (SC), spiral nematode (MO), sting nematode (FL, GA, SC), stubby root nematode (SC).
[d] Virus diseases listed included: *Soybean mosaic virus* (SC), *Soybean vein necrosis virus* (AR, DE, KY, MD, MO, MS).

Table 4. Estimated suppression of soybean yield (Millions of Bushels) as a result of disease during 2024.

	yield suppression by state (millions of bushels)[a]																
Disease	**AL**	**AR**	**DE**	**FL**	**GA**	**KY**	**LA**	**MD**	**MO**	**MS**	**NC**	**OK**	**SC**	**TN**	**TX**	**VA**	**TOTAL**
Anthracnose	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	**0.03**
Bacterial diseases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Brown stem rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Cercospora leaf blight	0.11	0.35	0.00	0.00	0.04	0.11	0.44	0.00	0.03	1.62	0.03	0.02	0.07	0.08	0.00	0.00	**2.91**
Charcoal rot	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.15	0.00	0.03	0.25	0.00	0.04	0.00	0.00	**0.51**
Downy mildew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Frogeye leaf spot	0.05	0.88	0.00	0.00	0.00	0.85	0.06	0.00	0.00	0.00	0.05	0.00	0.00	0.96	0.00	0.00	**2.86**
Fusarium wilt and root rot	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	**0.06**
Other diseases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Phomopsis seed decay	0.00	0.01	0.00	0.00	0.01	0.96	0.00	0.00	0.03	0.01	0.67	0.00	0.04	0.08	0.00	0.00	**1.81**
Phytophthora root and stem rot	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	1.51	0.00	0.01	0.00	0.00	0.04	0.00	0.00	**2.20**
Pod and stem blight	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.00	0.03	0.00	0.00	0.00	0.07	0.04	0.00	0.00	**0.24**
Purple seed stain	0.00	0.05	0.00	0.00	0.01	0.75	0.03	0.01	0.03	0.05	0.05	0.00	0.01	0.08	0.00	0.00	**1.09**
Red crown rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.01**
Reniform nematode	0.03	0.70	0.00	0.01	0.01	0.00	1.14	0.00	0.00	0.27	0.00	0.00	0.01	0.00	0.00	0.00	**2.18**
Root-knot nematode	0.23	7.40	0.15	0.03	0.16	0.00	1.17	0.45	0.00	2.71	1.00	0.00	0.07	0.01	0.00	0.05	**13.42**
Soybean cyst nematode	0.01	0.35	0.22	0.00	0.00	3.09	0.00	0.67	10.58	0.07	0.07	0.00	0.35	0.01	0.00	0.11	**15.52**
Lesion nematode	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	1.69	0.00	0.00	**1.75**
Other nematodes[b]	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	**0.08**
Rhizoctonia aerial blight	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.07	0.01	0.00	0.28	0.00	0.00	0.00	**0.45**
Sclerotinia stem rot (white mold - *Sclerotinia sclerotiorum*)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Seedling diseases	0.00	0.07	0.00	0.00	0.00	0.64	0.01	0.00	0.60	0.54	0.33	0.00	0.00	0.00	0.00	0.00	**2.20**
Septoria brown spot	0.00	0.09	0.00	0.00	0.00	0.21	0.01	0.01	0.00	0.14	0.33	0.00	0.00	0.80	0.00	0.00	**1.60**
Southern blight	0.06	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	1.69	0.67	0.00	0.01	0.80	0.00	0.00	**3.25**
Soybean rust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	**0.03**
Stem canker	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.15	0.00	0.33	0.00	0.00	0.00	0.00	0.00	**0.70**
Sudden death syndrome	0.00	0.01	0.00	0.00	0.00	0.96	0.00	0.00	3.02	0.00	0.00	0.00	0.00	0.00	0.00	0.27	**4.26**
Taproot decline	0.01	0.09	0.00	0.00	0.00	0.00	0.44	0.00	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	**1.62**
Target spot	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	**0.43**
Virus Diseases[c]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.02	0.04	0.00	0.00	**0.09**
Total disease %	**0.50**	**10.04**	**0.37**	**0.05**	**0.29**	**8.59**	**3.38**	**1.15**	**16.20**	**8.26**	**3.99**	**0.27**	**1.10**	**4.68**	**0.00**	**0.43**	**59.30**

[a] Rounding errors may exist since some numbers presented carry decimal places beyond the hundredths place.
[b] Other diseases listed included: none listed for 2024.
[c] Other nematodes listed included: Columbia lance nematode (SC), spiral nematode (MO), sting nematode (FL, GA, SC), stubby root nematode (SC).
[d] Virus diseases listed included: *Soybean mosaic virus* (SC), *Soybean vein necrosis virus* (AR, DE, KY, MD, MO, MS).

Table 5. Deviation of the 2024 temperature from the 30-year normal and the total precipitation for 2024 and the 30-year normal from each of the 16 southern soybean producing states based on data downloaded from the centroid for each respective state.

	Deviation from the 30-year temperature norm (°F) [a]												Total precip (in) [b]		
State	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**2024**	**30-year**	**Deviation**
Alabama	-4.7	5.9	1.1	-0.7	1.2	1.4	-0.3	2.9	-0.3	5.3	5.5	-0.6	54.5 (4)	59.1	**-4.6**
Arkansas	-5.3	6.9	3.5	1.4	1.5	-1.0	-3.7	-0.6	-2.7	5.4	3.8	.	49.2 (5)	52.2	**-3.0**
Delaware	2.1	2.0	3.0	0.6	0.4	3.3	0.7	0.3	-1.1	3.6	3.0	-0.9	33.6 (3)	43.9	**-10.3**
Florida	-1.2	0.9	0.0	-0.9	-0.5	-1.2	-2.3	0.9	-3.0	1.4	3.5	0.4	64.6 (6)	68.3	**-3.7**
Georgia	1.0	1.5	0.8	2.0	0.8	2.8	-0.5	-0.2	-0.2	1.8	3.5	-1.8	62.2 (8)	49.3	**12.9**
Kentucky	-5.1	9.2	3.6	1.2	1.1	-11.3	-2.7	-0.1	2.0	5.8	3.0	3.6	53.8 (5)	58.1	**-4.3**
Louisiana	-2.8	5.6	1.6	1.8	2.0	1.9	0.1	3.3	-0.1	6.4	7.7	5.8	63.7 (4)	53.4	**0.3**
Maryland	1.9	3.3	4.7	2.1	2.5	3.8	2.6	1.1	0.6	2.5	5.3	-0.5	36.6 (3)	46.9	**-10.3**
Missouri	-6.2	16.9	5.9	4.7	2.8	2.4	-0.4	-2.0	3.6	5.3	-2.2	5.7	42.3 (5)	38.5	**3.8**
Mississippi	-4.0	6.5	0.4	0.6	2.1	3.3	-3.2	-0.9	-2.1	5.5	4.8	2.8	56.9 (6)	59.3	**-2.4**
North Carolina	2.4	2.3	3.4	1.5	1.1	2.9	0.2	-1.1	-1.2	0.9	3.8	0.2	49.2 (5)	50.8	**-1.6**
Oklahoma	-5.6	9.0	4.5	4.8	1.5	5.1	0.6	1.7	4.7	10.9	3.0	.	31.3 (2)	38.8	**-7.5**
South Carolina	2.6	2.6	3.9	1.3	1.6	3.3	1.5	-0.1	0.4	2.6	3.8	1.0	47.7 (5)	45.3	**2.4**
Tennessee	-5.6	7.8	2.6	0.2	1.0	-0.3	-2.2	-0.5	-2.0	3.5	2.4	.	46.0 (4)	56.2	**-10.2**
Texas	-3.0	8.2	3.5	0.5	0.7	0.0	-2.1	1.1	-0.4	6.8	5.1	3.6	47.1 (5)	48.9	**-1.8**
Virginia	3.4	4.7	5.5	2.2	2.5	5.5	1.7	1.2	-1.1	3.7	4.9	-0.7	41.8 (4)	45.8	**-4.0**
Avg.	**-1.9**	**5.8**	**3.0**	**1.5**	**1.4**	**1.4**	**-0.6**	**0.4**	**-0.2**	**4.5**	**3.8**	**1.4**	--	--	**-44.3**

[a] Deviations of temperature were calculated based on subtracting the average temperature for each month from the 30-year normal. Negative numbers are deviations below the normal and positive numbers are deviations above the normal temperature for the 30-year period from 1991-2020.

[b] Numbers in parentheses equal the number of months where the total rainfall was greater than the 30-year normal for each month at the given location. Only values greater than 0.0 were considered "above the normal".