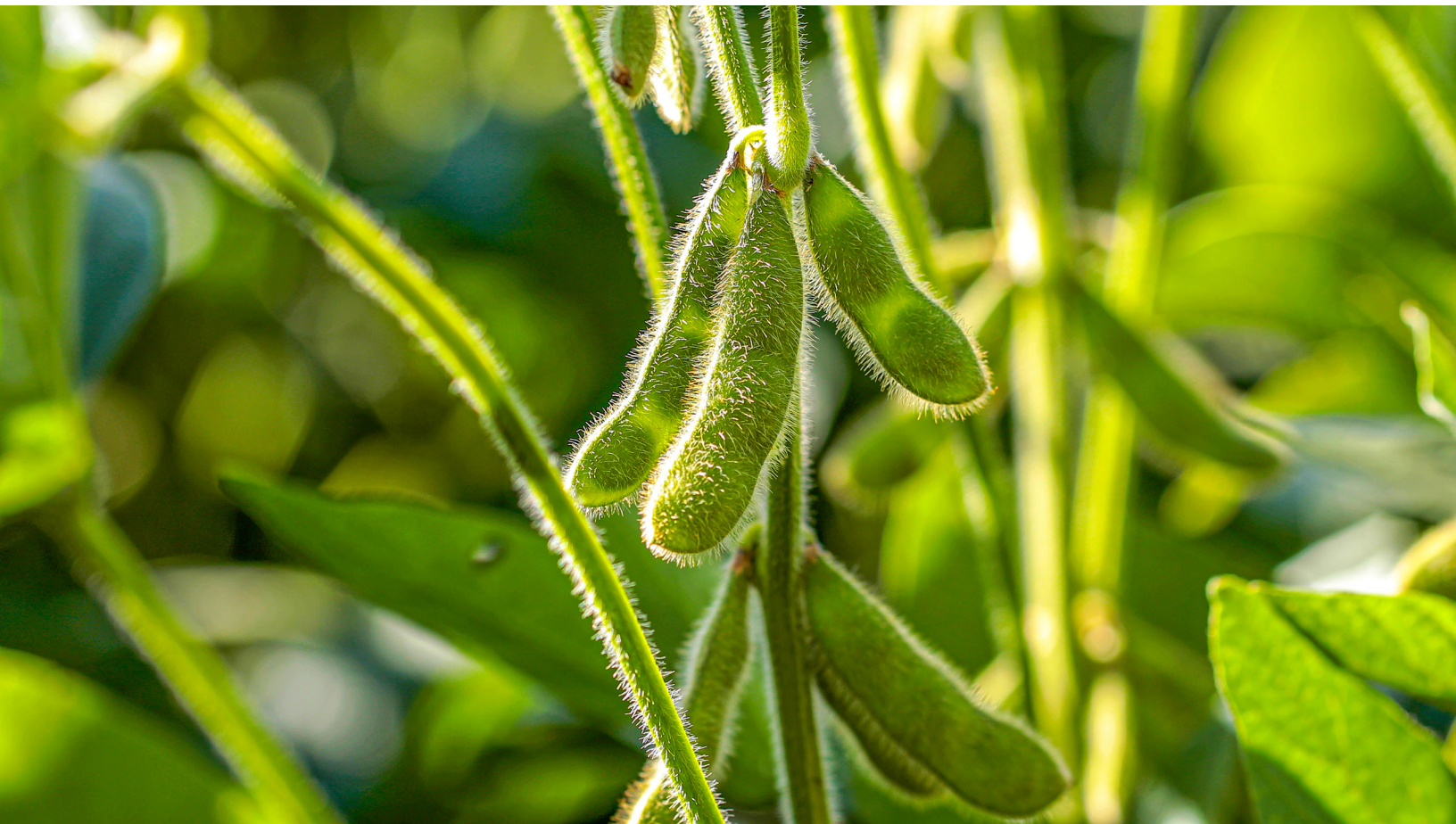




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Soybean: A Producers Guide to Drought Preparation and Recovery in the Southeastern United States



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ABOUT

“Soybean: A Producers Guide to Drought Preparation, Management, and Recovery in the Southeastern United States” is one in a set of guides to help Southeastern United States producers of economically important agricultural commodities build resilience to, prepare for, and recover from drought impacts. All guides are found on the USDA Forest Service Treesearch website.

DISCLAIMER

This guide contains a compilation of information from multiple States in the Southeastern United States. Therefore, some of the links and resources may not be relevant or even appropriate for your location. Information in this document was provided by USDA and various university Extension staff and based on shared experiences preparing for and recovering from drought impacts; however, individual producer situations will vary. This guidance should not be interpreted as required actions by regulatory or insurance agencies. STATE OR LOCAL GUIDANCE/REGULATIONS AND INSURANCE POLICIES SUPERSEDE THE RECOMMENDATIONS IN THIS GUIDE. Check with your local Extension agent; county, State, or Federal contact; consultant; or insurance agent regarding the appropriateness of these recommendations to your specific situation.

PESTICIDE STATEMENT

Improperly used pesticides can injure humans, animals, and plants. Follow the directions and heed all precautions on the labels. Apply pesticides so as not to endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honeybees or other pollinating insects are active, or in ways that may contaminate water or leave illegal residues.

NOTE

Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.

ACKNOWLEDGMENTS

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Front cover image: Greatly magnified photo of green soybean pods growing on a plant. Licensed photo by Adobe Stock_mailsonpignat.



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Southeast Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

Soybean: A Producers Guide to Drought Preparation and Recovery in the Southeastern United States

THIS GUIDE WILL FOCUS ON:

- Building pre-drought resilience in soybean production
- Implementing adaptive crop management practices during a drought to minimize soybean production losses
- Coordinating crop assessment and recovery efforts post-drought

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Introduction

Preparing for, managing, and recovering from drought events



Rows of withered soybean plants growing in cracked dry soil. (USDA Forest Service photo by Bob Nichols)

Drought is a natural part of the Southeastern United States climate and a threat to agricultural productivity and profitability. Whether slow developing or rapid onset, droughts can have negative effects on crops and livestock depending on timing, severity, and length. Droughts are expected to become increasingly common in the Southeastern United States due to increasing temperatures, longer dry periods between rain events, and growing water demand across the region.

To help producers remain resilient and productive in the face of this threat, the U.S. Department of Agriculture (USDA) Southeast Climate Hub and subject matter experts from university Extension and the USDA Natural Resources Conservation Service (NRCS), in collaboration with the U.S. National Oceanic and Atmospheric Administration (NOAA) National Integrated Drought Information System (NIDIS), developed this guide to help soybean producers prepare for and recover from droughts. This guide is separated into three primary sections:

- The **Building a Resilient Operation (Pre-Drought)** section provides adaptation initiatives and tools producers can use to prepare for and increase their resilience to drought.

SOYBEAN: A PRODUCERS GUIDE TO DROUGHT
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SOUTHEASTERN UNITED STATES

INTRODUCTION

- The **Adaptive Actions During a Drought** section highlights important decisions to consider in response to drought conditions. Well-prepared producers can rely on tools and adaptive protocols presented in this guide to help inform the decision-making process.
- The **Drought Recovery (Post-Drought)** section outlines actions producers can take to minimize losses and seek out available assistance following a drought.

The guide also includes an appendix with:

- Two customizable templates for a **Drought Plan** and a **Contacts List**. The **Building a Resilient Operation** section outlines what to include in these two documents as well as their use.
- **Seasonal Decision Tables** for guidance on key decisions that will help you plan for and mitigate drought impacts throughout the year.
- **Initial Site Planning** guidance that can be referenced if purchasing or leasing new land.
- Federal, State, and Extension **Resource Links** to help inform short- and long-term decision making. Many of these resources appear throughout the guide and are also included in appendix 5.

This guide's layout and how it is intended to be used can be found in figure 1. After recovering from a drought, producers should refer to the **Building a Resilient Operation** section and incorporate guidance and lessons learned into their management and farm emergency plans.

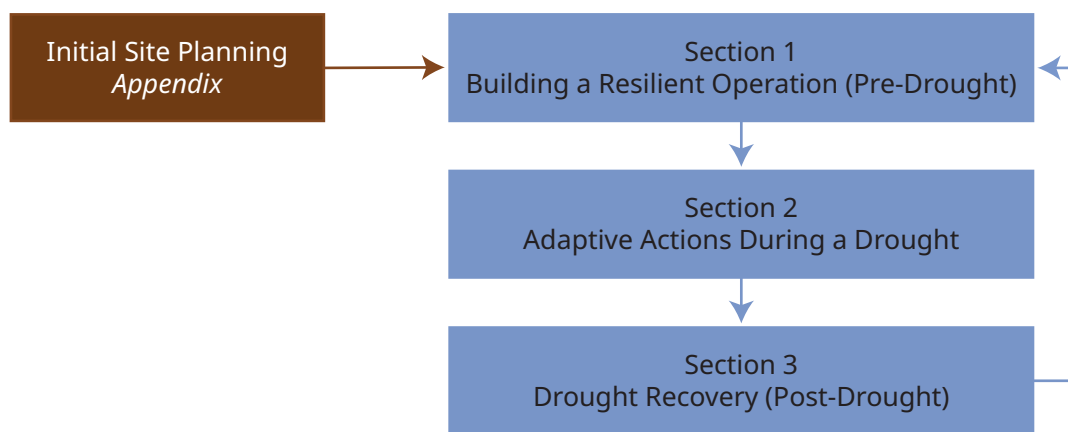


Figure 1—Layout and use of the drought preparation, management, and recovery guide.

SECTION 1

Building a Resilient Operation (Pre-Drought)

Practices that can be adopted well before a drought occurs to maintain productivity, reduce the risk of crop loss, and reduce recovery time



Irrigation equipment watering healthy soybean plants. (Courtesy photo by University of Arkansas, Division of Agriculture)

What is a resilient operation?

- A resilient operation adopts practices that help to mitigate potential drought and its effects. These practices include:
 - Working with technical service providers (e.g., Extension agents, NRCS field staff) to develop and implement a drought plan, monitoring drought conditions and responding accordingly
 - Matching soybean variety selection to seasonal weather forecasts
 - Applying insecticide/nematicide to promote early season growth and root development
 - Expanding existing wells or ponds, and installing wells to refill ponds during periods of prolonged drought

SECTION 1: BUILDING A RESILIENT OPERATION (PRE-DROUGHT)

- Keeping pre- and post-drought records of crop conditions to aid with disaster assistance and insurance claims.
- The recommendations in this guide have been shown to increase drought resilience when properly used on soybean farms in the Southeastern United States. To learn more about building resilience to drought on your farm, use the **Resource Links** in appendix 5 to find local Extension offices and other State and Federal resources that you may consult for further guidance.

Personal and worker safety

- Drought often occurs during periods of increased sun exposure and heat. Whenever possible, outdoor manual labor should be limited to early morning and late evening hours to avoid heat-related illnesses.
- Clean, cool water should always be available for workers, as should a source of shade or air conditioning to allow for temporary relief from the sun and heat.
- To learn more about assessing levels of sun exposure and heat stress, see:
 - National Institute for Occupational Safety and Health [OSHA-NIOSH Heat Safety Tool Application](#) (USDCDP 2025)
 - NOAA National Weather Service (NWS) [HeatRisk website](#) (USDC 2025a)
 - North Carolina State Climate Office, [Extreme Heat Dashboard](#) (NCSCO 2026)
 - Southeastern Coastal Center for Agricultural Health and Safety [Heat Stress website](#) (SCCAHS 2025)

Drought planning

- Episodic drought in the Southeastern United States is inevitable. The impact on crops can vary depending on the time of year that drought occurs (table 1). Developing and maintaining a drought plan for your operation is an important step in being prepared.
- Work with your local Extension agent or NRCS office (or both) to develop a drought plan. Refer to the **Drought Plan** guidance in appendix 1 for a more detailed description of what should be included in the plan.
- Consult the **Seasonal Decision Tables** in appendix 2 for guidance on key decisions that will help you plan for and mitigate drought impacts.

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SECTION 1: BUILDING A RESILIENT OPERATION (PRE-DROUGHT)

Table 1—Anticipated drought impacts by season with corresponding crop management considerations

	Post-Harvest and Pre-Planting	Planting	Growing	Harvesting
Drought impacts	• Reduced soil moisture • Reduced cover crop growth • Delayed fertilizer application	• Delayed germination • Stunted seedling growth • High seedling loss • Seedlings susceptible to insect damage • Reduced herbicide effectiveness	• Delayed/reduced plant growth • Delayed/reduced fruit set • Reduced yield • Increased insect damage • Reduced herbicide effectiveness	• Minimal
Crop management actions	• Irrigation system repair and maintenance • Ordering agrichemicals for next growing season • Variety selection/ordering seed • Soil improvements • Weed control	• Review of variety selection • Planting date • Irrigation strategy • Pest/disease monitoring • Soil moisture monitoring • Seeding density • At-planting weed control • Fertilization strategy	• Irrigation system use • Fertilizer application • Dryland decisions • Pest and disease monitoring and control	• Harvest timing • Soil sampling and analysis • Cover cropping • Crop rotation strategy
Decision-making resource	• Long-term drought outlook • El Niño Southern Oscillation (ENSO) forecast	• Short- and long-term drought outlook • ENSO forecast • Local forecast • Soil moisture maps • Extension decision support tools	• Short-term drought outlook • Local forecast • Soil moisture maps • Smart irrigation app • Tropical weather outlook	• Short-term drought outlook • Local forecast • Tropical weather outlook

Drought monitoring

- Building resiliency on your land requires knowledge of current and forecasted weather conditions. Knowing the weather and climate data available to you and how to access the data are vital steps in preparing for, mitigating, and recovering from drought. Additionally, the experience you have managing your fields is an important factor because you know how your crops respond to the stress of dry conditions. This combination of data and experience will be most beneficial when drought arises.
- On-farm measurements of precipitation, temperature, and soil moisture, combined with experience, are the best ways to inform site-specific decisions.
- In addition to on-farm monitoring, the [U.S. Drought Monitor](#) (NDMC, USDC, USDA 2025) and the [U.S. Drought Portal](#) (USDC 2025b) are good places to find current drought information, outlooks, related data, and maps at the State, county, and other geographic scales. These sites include current and historical data and drought impacts by sector (i.e., agriculture, manufacturing, energy).
- To learn more about the U.S. Drought Monitor, USDA programs triggered by the U.S. Drought Monitor data, and how the data can inform decision making, see the Farmers.gov [Ask the Expert: Understanding the U.S. Drought Monitor; a Q&A with Brian Fuchs](#) (USDA FG 2025a).
- The USDA and partners publish a weekly Weather and Crop Bulletin and Drought updates that summarize current weather, climate, and agricultural developments across the United States. To view these and other weather- and crop-related updates, see the USDA [Publications website](#) (USDA 2025).

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- NWS Drought Information Statements provide updated regional reports on active droughts. To view these reports, see the NOAA NIDIS National Weather Service [Drought Information Statements website](#) (USDC 2025c).
- Receive drought news, forecasts, invitations to timely webinars covering climate outlooks and impacts, and alerts through your email by visiting the Drought.gov Drought Early Warning System (DEWS) [Regions Drought information website](#) (USDC 2025d) and subscribing to one or more of the mailing lists.
- When drought is forecasted or beginning on your farm, refer to your drought plan for actions that you can take to reduce risk and maintain productivity.

Long-term drought outlook

- Outside of the growing season, producers should view forecasts and long-term outlooks to plan for potential conditions in the coming months. These data will help in making long-term decisions, such as selecting crop varieties and assessing water needs.
- Use the following resources to help monitor long-term climate-related outlooks:
 - The [Climate Prediction Center](#) (CPC) (USDC 2025e) creates 6–10 day, 8–14 day, 3–4 week, 1-month, and 3-month temperature and precipitation outlooks to assist with long-term planning efforts. While day-to-day conditions may differ, these outlooks are the best available forecast for the period of interest.
 - The CPC [Drought Information website](#) (USDC 2025f) includes monthly and seasonal drought outlooks. These maps can show where the CPC thinks drought will develop, persist, remain but improve, or be removed.

Short-term drought outlook

- Drought can stress crops differently depending on the growth stage. Monitoring weather information and having reliable short-term forecasts can help you stay prepared for adverse weather conditions and make quick decisions when needed. Weather and climate data and water and streamflow monitoring tools can help growers know when irrigation may be necessary so that plans can be made, and weekly water demands can be met.
- National Weather Service Forecasts—[National Weather Service](#) (USDC 2025g) offices produce 7-day forecasts for their coverage area. Each local forecast includes weather conditions, high and low temperatures, wind speed, and relative humidity. It is updated throughout the day. To access your local forecast, enter your ZIP code into the search box or click on the national map. For a more convenient option, use your mobile phone to access the [weather.gov website](#) (USDC 2025g).
- Weather Prediction Center Rainfall Forecasts—Outlooks and forecasts produced by the Weather Prediction Center are conveniently located on the Drought.gov [Outlooks and Forecasts website](#). (USDC 2025h). Quantitative precipitation forecasts (QPF) are a daily measure of how much precipitation is predicted to fall over the next week. You will also find cumulative precipitation maps that show the total precipitation expected to fall over a certain

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number of days. This information is useful for planning various tasks around rainfall events, including sowing, fertilizer or pesticide application, and harvest.

- Tropical Weather Outlook—The National Hurricane Center (NHC) produces an [Atlantic 7-day Graphical Tropical Weather Outlook](#) (USDC 2025i). This map describes the percent chance of tropical cyclone formation in the Atlantic Basin for 7 days. In the Southeastern United States, hurricanes and tropical storms occur regularly in the summer and fall. These weather systems are often destructive but can also provide much needed rainfall during dry conditions.

Flash drought

- Flash drought refers to the rapid onset or intensification of drought brought on by below-normal rainfall and increased evaporative demand that lead to reduced soil moisture causing decreased crop yield or crop failure.
- Flash droughts develop quicker (days to weeks) compared to conventional droughts (months to years) and can cause major yield losses if they coincide with sensitive stages like like bloom and grain fill. Flash droughts are harder to monitor and plan for using traditional approaches.
- Unlike conventional droughts, flash droughts can develop during seasons with near-normal total precipitation.
- Producers should closely monitor crop conditions during drought, especially during critical growth stages, and plan for greater water and irrigation needs.
- The Alabama Office of the State Climatologist in partnership with NOAA NIDIS is developing decision-support tools to assist real-time monitoring and inform farmers about when and where flash drought impacts are most likely to occur.
- See the NOAA NIDIS U.S. Drought Portal (USDC 2025b) for news about these and other decision-support products to better inform your drought planning, monitoring, and management activities.

Crop considerations

- Each year, a working group of Extension specialists and researchers publishes an updated [Southeastern U.S. Vegetable Crop Handbook](#) (SE Vegetable Handbook) (UTIA 2025a). The handbook is an all-in-one resource for managing your vegetable crop and includes nutrient and pest guidance related to drought.
- Contact your local [USDA Service Center](#) (USDA FG 2025b) and connect with Natural Resources Conservation Service (NRCS) field staff and Farm Service Agency (FSA) specialists to learn about programs that can help you establish conservation plans, mitigate drought, recover from disasters, manage your soybean operation more efficiently, and much more.

SECTION 1: BUILDING A RESILIENT OPERATION (PRE-DROUGHT)

Water requirements

- Aligning water needs to correspond with the current growth stage of your soybean crop is critical for maximizing productivity and economic return. See table 2 for critical water needs during different growth stages.
- Use a soil moisture sensor/probe in combination with tracking the growth stage of your plants to help make timely decisions about meeting water demand.
- **At planting:** Some at-planting herbicides require up to 0.5 inch of rain to activate, while others require 0.1–0.2 inches of rain. Check herbicide labels before applying.
- **Germination:** Soybeans need to only absorb about 50 percent of their weight in water to germinate
- **Bloom (first flower R1—full flower R2):** Beyond emergence, soybean requires soil moisture at an increasing rate until it reaches its peak at full flower (R2), between 78 and 84 days after planting. Water demand remains greater than 1 inch per week over the 5 weeks following R2, peaking at 1.5–2 inches per week.
- To learn more about soybean growth stages, see:
 - Clemson University Cooperative Extension Service [Visual Guide to Soybean Growth Stages](#) (Plumlee and Harelson 2022).
 - University of Arkansas Division of Agriculture Research and Extension [Soystage website](#) (UA 2025)

Table 2—Soybean critical watering needs by growth stage

Soybean growth stages—(inches per week)					
At planting	Germination	Vegetative growth	Beginning of reproductive growth	Seed fill and late reproductive growth	Maturation
<0.2	<0.2	Increasing 0.5–1	Increasing 1–2	Decreasing 1.5–1	1.5–1

The frequency of irrigation will vary based on soil type. Very sandy soil may require daily irrigation. Heavier clay soil may require less frequent irrigation.

Variety selection

- Observing the soybean variety performance from replicated trials conducted by university Extension specialists, especially trials conducted in drought conditions and similar soil types, can aid growers in the selection of drought tolerant varieties.
- Planting different varieties will also help in mitigating the effect of drought.
- For the latest soybean variety trial results, see:
 - Alabama Agricultural Experiment Station at Auburn University, [Variety Testing Program website](#) (AAES 2025)
 - Clemson University College of Agriculture, Forestry and Life Sciences, [Agronomic Crop Variety Trials website](#) (CU 2025a)

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- Louisiana State University AgCenter, [Soybean Varieties website](#) (LSUAC 2025a)
- Mississippi State University Agricultural and Forestry Experiment Station, [Mississippi Variety Trials website](#) (MSUAFES 2025a)
- North Carolina Cooperative Extension, [Official Variety Testing website](#) (NCCE 2025a)
- University of Arkansas Agricultural Experiment Station, [Variety Testing Programs website](#) (UAAAES 2025)
- University of Florida Institute of Food and Agricultural Sciences (IFAS) Extension West Florida Research and Education Center, [Soybean website](#) (UF 2025a)
- University of Georgia College of Agricultural and Environmental Sciences, [Statewide Variety Testing website](#) (UG 2025a)
- University of Kentucky Department of Plant and Soil Sciences, [Crop Variety Testing website](#) (UK 2025a)
- University of Tennessee Institute of Agriculture, [Soybean Variety Tests website](#) (UTIA 2025b)
- Virginia Cooperative Extension, [Virginia On-Farm Soybean Research website](#) (VCE 2025a)
- Though growers may order seed in the winter, increasing indications of a dry growing season may require cancellation or modification of orders through March or April.
- Later maturing varieties may be more resilient to drought, but if long-term forecasts indicate a late year drought, earlier maturing varieties may be a better choice.

Planting dates

- The best strategy to mitigate drought is to spread the plantings a few acres at a time throughout the recommended planting window for your State. Planting consistently throughout the recommended window will limit the effects of short-lived drought to only a small fraction of your acreage.
- Crops need sufficient soil moisture and temperature for germination. If soil conditions are not suitable, growers may temporarily delay planting until conditions improve. Conversely, if adequate soil moisture is available in mid- to late April, most growers should proceed with planting unless temperatures are unusually cool.
- To ensure that your crop insurance covers any drought damage to your crop, plant your crop before the final planting day for crop insurance in your State. This date may vary by county and year, so use the USDA Risk Management Agency (RMA) [Actuarial Information Browser Tool](#) (USDA RMA 2025a) to determine the final planting date for your crop.
- Though the late planting period continues beyond the final planting date, check with your insurance provider for details that may apply if you plant during this period. Again, look closely at insurance policies to determine specific information, as requirements can change.

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Seeding rates

- Growers should plant seeding rates to achieve 1) optimal stands, and 2) optimal yields. A sparse plant population is generally better than extremely thick stands for drought mitigation; growers should not intentionally plant low seeding rates unless there is a high degree of confidence in the drought forecast.
- Dry conditions increase the difficulty of crop establishment and lower yield. Check with the manufacturer regarding specific planting density modifications.
- A final plant stand of approximately 75,000–80,000 plants per acre is generally needed to maximize soybean yield.

Crop rotation

- Ample crop rotation is necessary to reduce the likelihood of nematodes, which feed on roots and exacerbate the effects of drought. A good crop rotation will often rotate soybean with a monocot (grass) crop such as corn to help reduce disease and rotate herbicide modes of action.
- Contact your local Extension office to learn how rotating crops can reduce risk and increase productivity.
- For more guidance on rotating crops, see the USDA NRCS [Conservation Crop Rotation Practice Standard website](#) (USDA NRCS 2025) and contact your local NRCS field office.

Pest and disease concerns

Nematodes

- Growers are often concerned about the impact of nematodes on soybean, especially during drought conditions. High numbers of nematodes tend to exacerbate the effects of drought by further inhibiting the uptake of water and nutrients through roots.
- Collect and submit soil samples to test for nematodes. Soil sampling should be completed in the fall so you can control or chemically reduce nematodes in the field if needed. Work with your local Extension agent to determine the best course of action.
- Depending on the type of nematode discovered in your soil samples, the threshold for taking action can differ. In the case of soybean cyst (*Heterodera glycines*), lance (*Hoplolaimus columbus*), or sting (*Belonolaimus longicaudatus*) nematode, the threshold is 1 per 100 cc of soil. For root-knot (*Meloidogyne* spp.), reniform (*Rotylenchulus reniformis*), lesion (*Pratylenchus* spp.), and stubby root (*Paratrichodorus minor*) nematode, the action threshold is 10–30 per 100 cc of soil.
- Another option is to plant a nematode-resistant variety. These varieties are especially helpful when managing the impact of soybean cyst, root-knot, and reniform nematodes.
- To learn more about testing for nematodes, see:
 - Alabama Cooperative Extension System, [Collecting Soil and Root Samples for Nematode Analysis website](#) (ACES 2025a)

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- Clemson University, [Plant and Pest Diagnostic Clinic website](#) (CU 2025b)
- Louisiana State University AgCenter, [Nematode Advisory Service website](#) (LSUAC 2025b)
- Mississippi State University Extension Service, [Plant Diseases and Nematode Diagnostic Services website](#) (MSUES 2025a)
- North Carolina Department of Agriculture & Consumer Services, [Agronomic Services website](#) (NCDACS 2025)
- University of Arkansas Cooperative Extension Service, [Arkansas Nematode Diagnostic Laboratory website](#) (UACES 2025a)
- University of Florida IFAS Extension, [Nematode Assay Lab website](#) (UF 2025b)
- University of Georgia Cooperative Extension, [Guide for Interpreting Nematode Assay Results](#) (UGCE 2025a) and Department of Plant Pathology Nematology Laboratory, [Sampling for Plant-Parasitic Nematodes Identification and Diagnosis](#) (UG 2020)
- University of Kentucky Research and Education Center at Princeton, [Soil and Plant Diseases Diagnostic Services website](#) (UK 2025b)
- University of Tennessee Institute of Agriculture, [Soil, Plant and Pest Center website](#) (UTIA 2025c)
- Virginia Cooperative Extension, [Diagnostic and Laboratory Services website](#) (VCE 2025b)

Insects, mites, and weeds

- Scouting for pests is an important step as growers prepare for the planting and growing seasons. Warm/dry winters may increase or overwinter pest populations, so growers should be proactive in scouting. Contact your local Extension agent for additional guidance about managing pests in your fields.
- Be aware that insect pest complexes can change in drought-impacted soybean fields. For example:
 - Spider mites (*Tetranychus urticae*) reproduce better in stressed soybean. They are less likely to be controlled by a naturally occurring fungus that often keeps them in check when wet and humid weather patterns predominate.
 - False chinch bugs (*Nysius raphanus*) can migrate into soybeans when their weedy hosts no longer provide enough moisture.
 - Additionally, at-plant insecticides, including seed-applied and in-furrow, may not be taken up as well into the plant during drought conditions. Even in dry conditions, there is usually no need to control aboveground seedling pests such as bean leaf beetles (*Cerotoma trifurcata*) or thrips (order Thysanoptera), or belowground pests. In most parts of the region, concerns about drought affecting at-plant and seed-applied insecticide application are unfounded. However, in the Mid-South region (southeastern Arkansas, Louisiana,

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Mississippi, western Tennessee), insecticidal seed treatments can safeguard yields against belowground pests.

- Do not alter insecticide treatment thresholds in response to drought conditions. Growers may be inclined to skip treating soybeans during droughts due to their reduced yield potential. However, it is important to note that stressed soybean plants are less capable of compensating for damage caused by pests such as corn earworms/soybean podworms (*Helicoverpa zea*) and stink bugs (family Pentatomidae), which feed on the seeds. Consequently, the potential yield loss from these insect infestations is often higher in drought-stressed soybean crops, and growers are advised to apply treatments.
- Warm/dry winters can increase weed pressure in fields, increasing the need for weed control. In such conditions, effective early termination of winter cover crops and elimination of weeds will help conserve available soil moisture.
- For a list of common soybean pests in your area and recommended treatments, see:
 - Alabama Cooperative Extension System, [Soybean IPM Guide website](#) (ACES 2025b)
 - Clemson University Cooperative Extension Service, [South Carolina Pest Management Handbook](#) (CUCES 2025a)
 - Louisiana State University AgCenter, [Insect Pest Management Guides website](#) (LSUAC 2025c)
 - Mississippi State University Extension Service, [Insect Control Guide for Agronomic Crops website](#) (MSUES 2025b)
 - North Carolina Cooperative Extension, [Soybean Insect Pests website](#) (NCCE 2025b)
 - Southern Integrated Pest Management Center, [MyIPM app](#) (SIPMC 2025)
 - University of Arkansas Cooperative Extension Service, [Field Crop Pest Management website](#) (UACES 2025b)
 - University of Florida IFAS Extension, [Vegetable Production Handbook of Florida website](#) (UF 2025c)
 - University of Georgia Cooperative Extension, [Georgia Pest Management Handbook website](#) (UGCE 2025b)
 - University of Kentucky Department of Entomology, [Integrated Pest Management Program website](#) (UK 2025c)
 - University of Tennessee Institute of Agriculture, [Soybean Insect Guide website](#) (UTIA 2025d)
 - Virginia Cooperative Extension, [Pest Management Guide-Field Crops website](#) (VCE 2025c)

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Disease concerns

- Disease is often a concern when a pathogen has a susceptible host and environmental conditions that allow it to reproduce and survive. Many foliar diseases that could impact soybean prefer hot, humid, wet conditions. While dry conditions are not ideal for pathogen development, disease should not be overlooked during drought. Preventive fungicide applications should be made only if disease is present and favorable conditions are predicted.
- Speak with your local Extension agent for recommendations about which treatments would be most effective in your area. Planting resistant varieties for specific disease resistance is highly recommended as the best method of control.
- Furthermore, growers should avoid applying too much water to their crop. Overirrigating soybeans may create environmental conditions that are more favorable for disease development.
- For a list of potential diseases to watch for in your area and recommended control methods, see:
 - Alabama Cooperative Extension System, [Soybean IPM Guide website](#) (ACES 2025b)
 - Clemson University Cooperative Extension Service, [Identifying and Managing Foliar Fungal Diseases of Soybean](#) (Mueller et al. 2023)
 - Louisiana State University AgCenter, [Soybean Weed Insect and Disease Field Guide](#) (LSUAC 2025d)
 - Mississippi State University Extension Service, [Vegetable Diseases website](#) (MSUES 2025c)
 - North Carolina Cooperative Extension, [Soybeans: Disease Management website](#) (NCCE 2025c)
 - University of Arkansas Cooperative Extension Service, [Soybean Diseases website](#) (UACES 2025c)
 - University of Georgia College of Agricultural and Environmental Sciences, [Soybean Production Guide website](#) (UG 2025b)
 - University of Kentucky Department of Entomology, [Integrated Pest Management Program Soybean website](#) (UK 2025c)
 - University of Tennessee Institute of Agriculture, [Soybean](#) (UTIA 2025e)
 - Virginia Cooperative Extension, [Pest Management Guide-Field Crops website](#) (VCE 2025c)

Soil considerations

- Maintain optimum soil pH for soybean (6.0–6.5) to help promote root growth and drought resilience.

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- Use conservation tillage, such as no-till and strip-till, to achieve multiple benefits, including improved soil health, water conservation, water infiltration and potential increased yield and lower production costs.
- To learn more about conservation tillage, see Sustainable Agriculture Research and Education (SARE) [Conservation Tillage Systems in the Southeast](#) (Bergtold and Sailus 2020).
- In drought-prone fields, reduced tillage practices can somewhat offset the effects of drought. However, this should not be the only practice adopted because the positive impacts of such practices tend to be limited.
- Know the soil type(s) in your fields and how that impacts water holding capacity, drainage, and drought stress around your farm.
 - Sandier soils are more prone to drought than clay or silt soils because the water holding capacity of sandy soils is lower. For this reason, sandy soils are more likely to undergo hardpan formation, creating shallow-rooted soybean.
 - Shallow-rooted soybean is much more susceptible to the effects of severe drought than deep-rooted soybean. Therefore, growers planting soybean on sandy soils in a no-till system should strongly consider strip-tilling sandier fields to shatter the hardpan. Strip-tilling allows for noticeably improved root growth and development compared to no-till practices. Strip-tilling may be the best drought-mitigation practice for a grower in nonirrigated, sandy soils.
 - No-till systems are best utilized on clay or silt soils, which have a lower propensity for hardpan formation, especially in sloping fields where runoff is more likely than on flat fields.
 - Growers should first consider drought-mitigating practices on sandy soils and then expand those practices to other soils.
 - Review maps of drought-induced wilting from the previous year to identify fields or soils that should be targeted for drought mitigation efforts.

Soil health

- Healthy soils are essential for reducing drought risk and maximizing the productivity and profitability of your land. The NRCS recommends minimizing disturbance and maximizing soil cover, biodiversity, and the presence of living roots as the main principles for achieving healthy soils.
- For a summary of how these principles can help improve soil health over time, see [Your Soil Health Journey, What to Look for Along the Way factsheet](#) (USDA NRCS 2022a).
- To learn more about soil health and how NRCS can help you achieve healthy soils, see the USDA NRCS [Soil website](#) (USDA NRCS 2025a).

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Soil moisture

- Monitoring soil moisture on your farm is critical for maximizing planting, harvesting, and irrigation efficiency and productivity. Too much or too little soil moisture can negatively impact soybean quality and yields.
- To view the most current soil moisture maps, see the Drought.gov [Drought Indicators: Soil Moisture Product Dashboard](#) (USDC 2025j). This site contains moisture estimates for different soil depths and current soil moisture deviations from the historical average.
 - State-specific 20 cm (8 inch) soil moisture maps can be found on the [U.S. Drought Portal website](#) (USDC 2025b) by selecting your State under the By Location tab.
 - To learn more about monitoring soil moisture on your farm, see the National Center for Appropriate Technology (NCAT) Appropriate Technology Transfer for Rural Areas (ATTRA) [Soil Moisture Monitoring: Low-Cost Tools and Methods website](#) (NCAT 2006).
 - Another tool for assessing surface soil moisture and crop stress conditions is the Drought.gov [Evaporative Stress Index](#) (ESI) (USDC 2025k). ESI is a measure of anomalies in evapotranspiration rates over time and can also be useful for capturing early signals of flash drought.
 - It is important to note that soil moisture estimates may not accurately reflect the conditions on your farm. Frequently, drought maps now combine multiple data sources (e.g., weather records, soil maps, and remote sensing) to estimate farm-level drought more accurately.

Trees and windbreaks

- In some areas, tree lines and windbreaks can reduce wind, which could help avoid sandblasting or rapid drying of surface moisture. However, windbreaks have little impact when severe and prolonged drought occurs.
- Windbreaks can be very effective in reducing crop water use and water evaporation from the soil surface. They may be the only method to protect soil from wind erosion when little crop residue is available due to drought. New and modern designs of windbreaks (e.g., twin row-high intensity) can be more effective and require less land.
- See the USDA National Agroforestry Center [Windbreaks website](#) (USDA NAC 2025) for more information about how windbreaks can protect crops and provide economic, environmental, and community benefits.
- For more information on the design and planting of windbreaks, visit the NRCS [Windbreaks website](#) (USDA NRCS 2025b), and contact your local NRCS office or Extension agent.

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Improving soil health and drought resilience with the NRCS

- The Southeastern United States has seen many droughts. The goal of NRCS is to support the resilience of agriculture by addressing priority resource concerns with conservation practices. These voluntary practices help producers reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damage caused by natural disasters, including drought.
- Farmers are encouraged to develop an irrigation water management plan with NRCS conservationists or consultants to optimize water use and reduce irrigation costs.
- Producers interested in applying management actions that help mitigate drought risk across their operations may be eligible for financial support through the following NRCS programs:
 - [Environmental Quality Incentives Program](#) (EQIP)—Year-round NRCS rehabilitation program that can provide financial assistance to conserve ground water and surface water, reduce soil erosion, and mitigate drought impact (USDA NRCS 2025c)
 - [Conservation Stewardship Program](#) (CSP)—Year-round NRCS program that provides guidance and financial support to efforts that enhance current conservation plans (USDA NRCS 2025d)
 - [Regional Conservation Partnership Program](#)—A partner-driven program that leverages partner resources to advance innovative projects which address issues such as drought (USDA NRCS 2025e)
- NRCS continually evaluates and updates drought-resilient mitigation activities to reflect the latest science and any practice modifications that confer measurable benefits.

Steps to enhance drought resilience with NRCS assistance

Step 1: Contact your local NRCS office

- NRCS staff and the landowner can develop management plans that best use resources on the land. For a list of NRCS office locations, see the Farmers.gov [USDA Service Center website](#) (USDA FG 2025b).

Step 2: Develop a conservation plan

- A conservation plan is a written record of your management decisions, and the conservation practices you plan to use and maintain on your land. NRCS encourages landowners to work with conservation planners to voluntarily develop a plan that meets the personal and business objectives and specific needs of the landscape, the producer, or the land manager.
- NRCS conservationists can help farmers and ranchers understand the options for their unique water situation, soil type, and production goals. They can also work with you to develop a plan to get through a drought. Through conservation planning, many drought impacts can be reduced with water conservation and soil health practices.

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- Talk to your NRCS conservation planner about creating or updating your conservation plan and about any available conservation program cost-share opportunities. Plans are voluntary and can be modified as needed. All information provided to NRCS for conservation planning purposes is strictly confidential.

Step 3: Financial and technical assistance

- NRCS professionals can help farmers, ranchers, and forest landowners develop options for their unique water situation, soil type, and production goals. Funding is available to help farmers and ranchers pay for many of these practices through the [Environmental Quality Incentives Program](#) (EQIP) (USDA NRCS 2025c). Reimbursement rates typically cover about half the cost of the adopted practice. Additionally, funds may be available for erosion control through the [Emergency Watershed Protection \(EWP\) Program](#) (USDA NRCS 2025f).

Improving drought resilience and recovery with the USDA FSA

- The FSA offers programs and services that help farmers grow their operations and recover from disasters.
- Producers are encouraged to register their operation with the FSA and develop a professional relationship with their local FSA office prior to the onset of drought.
- To find local FSA offices, see the Farmers.gov [USDA Service Center website](#) (USDA FG 2025b).

Cover crops

- Consider planting cover crops in rotations of 3–4 years to help soils retain moisture, reduce runoff, and improve water infiltration into the soil. Heavy-residue cover crop systems, such as the rolled/crimped rye system, retain more surface moisture than a small-standing wheat cover crop.
- The goal is to accumulate as much biomass as possible and then roll or crimp it before planting. The thick layer of cover crop biomass left on the soil surface reduces evaporative losses of water, thereby mitigating drought to some degree.
- Growers typically grow small grains or legumes as cover crops. These need to be planted and grown during the fall, when there is usually sufficient soil moisture for germination.
- Cover crops, most notably cereal rye and other small grains, can reduce the impacts of weeds and certain pathogens. However, managing the cover crop to maintain soybean yield is a top priority. Using high-residue cover crops for pest suppression and water conservation has mixed results in soybean production systems across the region.
- Planting soybeans into high residue systems can, at times, result in lower soybean stands and cause some elongation of seedlings. Soybean stand reductions are not an issue if the soybean population remains at levels suitable for maximum soybean yield. Elongation of soybean seedlings usually has no impact on soybean yield.
- Plan your cover crop strategy well ahead of time and pay attention to precipitation forecasts to determine the best time to plant.

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- Cover crops can potentially alter the pest community in soybean seedlings. While the goal is to accumulate biomass, growers should seek to eliminate the “green bridge” by terminating cover crops 3–4 weeks before planting. This timing will minimize the number of pests feeding on the cover crop that may later feed on seedlings.
- Slugs pose a greater challenge in fields with heavy residue. They rely on the decaying residue as a food source and shelter from sunlight. Slugs can be problematic if a significant amount of residue is present in drought-impacted fields.
- See the following resources for integrating cover crops into your management plans:
 - USDA NRCS, [Soil Health website](#) (USDA NRCS 2025g)
 - SARE, [Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops](#) (Myers et al. 2019)
 - Alabama Cooperative Extension System, [Cover Crops for Alabama website](#) (ACES 2025c)
 - Clemson University Cooperative Extension Service, [Cover Crops for Weed and Nutrient Management](#) (Farmaha et al. 2020)
 - Louisiana State University AgCenter, [Cover Crop Decision Tool website](#) (LSUAC 2025e)
 - Mississippi State University Extension Service, [Cover Crops: Benefits and Limitations](#) (MSUES 2025d)
 - North Carolina Cooperative Extension, [Cover Crops website](#) (NCCE 2025d)
 - University of Arkansas Cooperative Extension Service, [Cover Crops website](#) (UACES 2025d)
 - University of Florida IFAS Extension, [Cover Crops website](#) (UF 2025d)
 - University of Georgia College of Agricultural and Environmental Sciences, [Cover Crops](#) (UG 2025c)
 - University of Kentucky, [Cover Crop Benefits and Challenges in Kentucky](#) (Quinn et al. 2019)
 - University of Tennessee Institute of Agriculture, [Resources on Cover Crops website](#) (UTIA 2025f)
 - Virginia Cooperative Extension, [Soil Health and Cover Crops website](#) (VCE 2025d)
- To learn about cover crops and Federal crop insurance, see the RMA [Cover Crops and Federal Crop Insurance website](#) (USDA RMA 2025b).

Water management

- Responsible and efficient water management on your farm will help reduce overall water use and costs associated with irrigation.

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- Each State offers unique resources, such as State regulations, irrigation testing programs, and best management practices, to help you with your water management needs. For more information, see:
 - USDA NRCS, [Water website](#) (USDA NRCS 2025h)
 - Alabama Cooperative Extension System, [Water Resources website](#) (ACES 2025d)
 - Arkansas Department of Agriculture, [Water Management website](#) (ADA 2025a)
 - Clemson University Cooperative Extension Service, [Water Resources website](#) (CUCES 2025b), and [Water Withdrawal Regulations Every Agricultural User in South Carolina Should Know](#) (Barnette et al. 2020)
 - Kentucky Energy and Environment Cabinet, [Best Management Practices website](#) (KEEC 2025a)
 - Louisiana State University AgCenter, [Best Management Practices website](#) (LSUAC 2025f)
 - Mississippi State University Extension Service, [Water website](#) (MSUES 2025e)
 - North Carolina Cooperative Extension, [Water Resources website](#) (NCCE 2025e)
 - Tennessee Department of Agriculture, [Land and Water Stewardship Section website](#) (TDA 2025)
 - University of Florida IFAS Extension, [Water Resources website](#) (UF 2025e)
 - University of Georgia Cooperative Extension, [Water & Drought website](#) (UGCE 2025c)
 - Virginia Cooperative Extension, [Water, Irrigation, and Drainage website](#) (VCE 2025e)

Irrigation

- It is essential to know the capacity of any irrigation system, including how much water can be applied per acre and how frequently it can be done.
- In some areas, power companies may charge higher rates per kilowatt hour or remotely shut off irrigation systems during peak demand in the summer months. This demand usually occurs between 1:00 and 2:00 p.m., and systems can resume irrigating after 6:00–7:00 p.m. The downtime is when the most evaporative losses are likely to occur and can be advantageous because water utilization by the crop is likely improved by irrigating at times when water loss is lowest. However, it may be difficult to meet weekly water demands for soybean in larger fields requiring 4–5 days for a center pivot to make one revolution. Therefore, system lags should be considered when scheduling irrigation.
- Remember that it is more critical to prevent wilting than to reverse it. For this reason, irrigation should be done before the onset of severe drought versus after the onset, as it is challenging to catch up on irrigation once a drought begins. See **Drought Monitoring** in this section to learn more about drought monitoring on your farm.

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- Irrigation for soybean begins before bloom. Sometimes, one or two irrigations are required for seed germination and seedling emergence in extreme cases.
- When irrigating, weekly rates exceeding 0.5 inch per week should be divided over two to three applications. The division of irrigation allows adjustments for any rainfall that may occur during any given week.
- Most irrigation systems cannot apply much more than 0.5–0.7 inch at a time without significant runoff or penetration below the root profile. Dividing weekly water requirements allows for better water use efficiency and savings if rainfall occurs during a week of drought development.
- Prioritize the maintenance and repair of your irrigation system:
 - Check irrigation efficiency (test irrigation for leaks and flow rates). Irrigation system maintenance and repair during the off-season is essential to minimize system downtime during the growing season when irrigation is necessary.
 - Service center pivots—Servicing and greasing hydraulic pumps on each wheelbase may be necessary, as well as inspecting softer pipework such as drop hoses, nozzles, or socks covering the junction between towers. Preventing leaks helps ensure that irrigation rates are consistent across the covered area.
 - Calibrate center pivots to verify the rates that the system is claiming to apply.
 - Calibrate irrigation lines during the first irrigation event of the season.
 - Depending on the water source (ponds, rivers/creeks/wells), filtration systems may need to be installed to prevent debris or sand from entering the irrigation system. Debris and sand can cause significant wear on pumps, joints, and valves.
- Review yields of irrigated versus dryland fields each year but make these comparisons only for fields with similar rainfall. In other words, the only difference was irrigation; planting date and other factors were the same. This comparison illustrates the true impact of your irrigation system in terms of value. This comparison will also help the grower prioritize which fields may need irrigation and identify irrigation systems that are not reaching their full potential due to limitations related to well size and depth or the size of retention ponds.
- For more information about irrigating soybean fields, see:
 - USDA NRCS, [Small Scale Solutions for your Farm: Irrigation Water Management](#) (USDA NRCS 2022b)
 - SARE, [Building Soils for Better Crops: Irrigation and Drainage](#) (Magdoff and van Es 2021)
 - Smart Irrigation Apps, [CropFit App](#) (SECC 2025)
 - Alabama Cooperative Extension System, [Irrigation website](#) (ACES 2025e)
 - Clemson University Cooperative Extension Service, [Irrigation Research website](#) (CUCES 2025c) and [Center Pivot Irrigation Test Program website](#) (CUCES 2025d)

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- Louisiana State University AgCenter, [Irrigation Resources website](#) (LSUAC 2025g) and [Drought Irrigation Response Tool](#) (LSUAC 2025h)
- Mississippi State University Extension Service, [Irrigation website](#) (MSUES 2025f) and Agricultural and Forestry Experiment Station, [Mississippi Irrigation Termination Optimization on-line app \(MITOOL\)](#) (MSUAFES 2025b)
- North Carolina Cooperative Extension, [Irrigation website](#) (NCCE 2025f)
- University of Arkansas Cooperative Extension Service, [Crop Irrigation website](#) (UACES 2025e)
- University of Florida IFAS Extension, [Irrigation website](#) (UF 2025f) and the Florida Department of Agriculture and Consumer Services, [Mobile Irrigation Labs website](#) (FDACS 2025a)
- University of Georgia Cooperative Extension, [Irrigation Reference Guide website](#) (UGCE 2025d)
- University of Kentucky Center for Crop Diversification, [Irrigation website](#) (UK 2025d)
- University of Tennessee Institute of Agriculture, [Irrigation website](#) (UTIA 2025g)
- Virginia Cooperative Extension, [Using Groundwater for Agricultural Irrigation in Virginia website](#) (VCE 2025f) and [Mid-Atlantic Commercial Vegetable Production Recommendations](#) (VCE 2025g)

Water quality testing

- Producers are encouraged to utilize water analytic testing services in their region, especially when irrigation water has the potential for high salt concentrations. Of particular concern is using surface or shallow ground water in areas where saltwater intrusion occurs.
- For more information about water quality testing, see:
 - Alabama Cooperative Extension System, [Water Testing in Alabama: Why, Where & When](#) (Carter and Haley 2024)
 - Clemson University Cooperative Extension Service, [Irrigation Water Quality Testing website](#) (Park et al. 2020)
 - Florida Department of Agriculture and Consumer Services, [Water website](#) (FDACS 2025b)
 - Kentucky Energy and Environment Cabinet, [Agriculture Water Quality Plan website](#) (KEEC 2025b)
 - Louisiana State University AgCenter, [Microbial Water Testing website](#) (LSUAC 2025i)
 - Mississippi State Department of Health, [Private Well Water Testing website](#) (MSDH 2025)
 - North Carolina Cooperative Extension, [Water Safety and Testing website](#) (NCCE 2025g)

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- University of Arkansas Cooperative Extension Service, [Water Diagnostic Testing](#) website (UACES 2025f)
- University of Georgia Cooperative Extension, [Soil and Water Testing Services website](#) (UGCE 2025e)
- University of Tennessee Extension, Office [Locations, Departments, and Centers website](#) (UTE 2025)
- Virginia Department of Agriculture and Consumer Services, [Food Produce Safety: Safe Water website](#) (VDACS 2025)

Water metering

- Install or use a water flow meter to help improve irrigation efficiency, increase yield, and reduce the demand for water supplies.
- To learn more about incorporating flow meters into your management plan, see:
 - Mississippi State University Extension Service, [Flow Measurement Series: Flow Meter Calculator](#) (MSUES 2025g)
 - University of Georgia Cooperative Extension, [Water Meters as a Water Management Tool on Georgia Farms](#) (Hawkins and Harrison 2015)

Stormwater capture

- It may be necessary to install ponds or reservoirs to ensure an adequate water supply for large irrigation systems that cannot apply sufficient weekly rates, utilize a water source that depletes rapidly, or where water is too costly to access. Such ponds should be built according to local permitting requirements and ideally built in nonproductive areas near the irrigation system.
- In some cases, installing a small well could be advantageous because these wells are typically less expensive, can access shallower aquifers, and, if left running, can refill ponds to full capacity when drought occurs.
- For more information about stormwater capture, see:
 - Clemson University Cooperative Extension Service, [Ponds in South Carolina](#) (White et al. 2021)
 - Georgia Soil and Water Conservation Commission, [Building or Renovating a Farm Pond in Georgia: A Guide of Citizens](#) (GSWCC 2024)
 - Kentucky Department of Fish and Wildlife Resources, [Farm Pond Management-Planning and Construction website](#) (KDFWR 2025)
 - Mississippi State University Extension Service, [On-Farm Water Storage Systems and Surface Water for Irrigation](#) (MSUES 2025h)

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- North Carolina State University, [Stormwater Engineering Group Resources website](#) (NCSU 2025)
- University of Florida IFAS Extension, [Farm Ponds in Florida Irrigation Systems](#) (Clark et al. 1989)

Dryland considerations

- Conversion to irrigation, assuming access to water is economical and feasible, is the best mitigation tactic to avoid drought.
- Consider drip irrigation in fields that are too small or oddly shaped to use center-pivot irrigation if it fits well into your operation.
- If irrigation is not possible, growers should strongly consider adopting a heavy residue cover crop system (rolled rye or triticale) or furrow diking (or both) to increase water holding capacity and improve infiltration into soils.
- In dryland situations, reduced tillage and proper fertility management to promote root growth (soil pH and fertilizing based on yield goal) are also encouraged.

Recordkeeping, documentation, and insurance

- The importance of pre- and post-drought documentation cannot be overstated.
- Record observations, especially wilting, and document conditions such as temperature or soil moisture status when wilting occurs.
- Map wilting by soil type if enough soil variation exists within the field. This map could help you identify which fields are more prone to drought, and which may need drought-mitigating practices. Wilting is nearly always associated with a yield penalty, although predicting how much of a yield penalty can be challenging. Wilting maps can be developed by surveying fields in person or using drones or other real-time imagery.
- Consider all your insurance options (e.g., RMA, other insurance options). Knowing which soils or fields are more prone to drought will help you understand how to divide your farm into enterprise units or other ways for crop insurance purposes. Your crop insurance company and agent can help with this process.
- Review your insurance policies regularly with your agent to ensure adequate coverage, including soil and crop erosion insurance. Generally, insurance policies will not cover damage if the policy was not in place before a drought occurred, so be aware of the limitations on how soon insurance will take effect.
- For more information about crop insurance, see the RMA [Crop Insurance website](#), including guidance on [Prevented Planting and Drought](#) and [Crop Insurance and Drought-Damaged Crops](#) (USDA RMA 2025c).
- Use the RMA [Agent Locator](#) (USDA RMA 2025d) to search for approved insurance providers.

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Drones

- Drone technology provides farmers and landowners the advantage of an overhead perspective to assess drought damage or to aid in the mapping of wilting.
- Consider getting an unmanned aerial vehicle (UAV) (i.e., drone) pilot license and purchasing a UAV. Small UAV quadcopters or hexacopters equipped with visual or RGB cameras are relatively inexpensive (\$500 to more than \$2,000). In addition, the use of UAVs will help with damage assessment.
- Using an infrared camera coupled to a UAV or infrared temperature sensors installed in critical areas of the field can assist in predicting plant drought stress before visible wilting.
- For regulations and information about operating a UAV, see:
 - U.S. Department of Transportation (DOT) Federal Aviation Administration, [Unmanned Aircraft Systems website](#) (DOT FAA 2025)
 - Mississippi State University Extension Service, [Field Scale Crop Assessment with Drones](#) (MSUES 2025i)
 - Tennessee State University Cooperative Extension, [Agricultural Uses for Drones](#) (de Koff and Saini 2020)
 - University of Florida IFAS Extension, [Preflight and Flight Instructions on the Use of Unmanned Aerial Vehicles \(UAVs\) for Agricultural Applications](#) (Kakarla et al. 2019)
 - Note that each State has its own legal requirements and regulations in addition to Federal laws

Contributing to the Condition Monitoring Observer Reports system

- Contribute to the [Condition Monitoring Observer Reports \(CMOR\) system](#) (UNL 2025) by reporting drought-related conditions and impacts on your farm.
- CMOR is a free online tool provided by the National Drought Mitigation Center (NDMC) in partnership with NOAA NIDIS and the USDA. It allows producers to submit observation reports on how wet or dry their farm is.
- Many people use CMOR to report drought conditions and impacts, but you are also encouraged to report when conditions are normal or wetter than normal. These reports help inform monitoring entities and are published on a nationwide map where anyone can view the submitted information and attachments.
- CMOR contributors are encouraged to submit frequent (weekly to monthly) reports with photos, even during nondrought conditions. Regular reports help establish a clear baseline of what “normal” conditions look like at a specific location. The baseline makes it easier for drought monitoring entities to identify when conditions deviate from normal and to assess the severity of drought. Photos are especially valuable because they provide visual evidence of localized drought impacts and allow for side-by-side comparisons of wet, dry, and normal conditions over time.

SECTION 2

Adaptive Actions During a Drought

Implement adaptive measures as drought conditions develop and persist. As prolonged periods of reduced precipitation continue, negative impacts on crop yield will begin to occur. Adaptive actions can help mitigate these negative impacts.



Combine harvesting soybeans. (Courtesy photo by USDA Flickr.com)

Personal health and well-being

As you observe and measure the impact of drought on your crops and livelihood, you must also consider its impact on your mind and body. The unpredictable nature of weather can cause stress to your physical, mental, and emotional health. If you notice symptoms or have concerns, seeing a doctor or talking to a counselor is encouraged. Thankfully, Federal and State agencies offer confidential counseling services for farmers. For guidance to help you through this stressful time, see:

- USDA National Institute of Food and Agriculture, [Farm and Ranch Stress Assistance Network](#) (USDA NIFA 2025)
- Alabama Department of Agriculture and Industries, [A Healthy You, A Healthy Farm website](#) (ADAI 2025)
- Arkansas Department of Agriculture, [Farm Stress and Mental Health website](#) (ADA 2025b) and the University of Arkansas Cooperative Extension Service, [Farm Stress Management and Resilience Project](#) (UACES 2025g)

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- Clemson University Cooperative Extension Service, [Farm Stress Management website](#) (CUCES 2025e)
- Florida Department of Agriculture and Consumer Services, [Farmer Stress Assistance website](#) (FDACS 2025c)
- Louisiana Department of Agriculture and Forestry, [Stay Rooted Louisiana website](#) (LDAF 2025)
- Mississippi Department of Agriculture & Commerce, [Agriculture Safety and Mental Health Coalition website](#) (MDAC 2025)
- North Carolina Agromedicine Institute, [NC Farm & Ranch Stress Assistance Network](#) (NCAI 2025)
- University of Georgia Cooperative Extension, [Rural Georgia: Growing Stronger Initiative website](#) (UGCE 2025f)
- University of Kentucky Martin-Gratton College of Agriculture, Food and Environment, [Family and Consumer Sciences Extension Areas of Focus website](#) (UK 2025e)
- University of Tennessee Family and Consumer Sciences, [Farm Family Health & Wellness website](#) (UTFCS 2025)
- Virginia Tech, [Farm Stress and Wellness Resources website](#) (VT 2025)

Review your drought plan

- Review your drought plan and adjust as appropriate. For more information on developing your plan, see the **Drought Plan** guidance in appendix 1.
- Consult the **Seasonal Decision Tables** in appendix 2 for guidance on key decisions that will help you plan for and mitigate drought impacts.

Continue drought monitoring

- Continue monitoring weather conditions and forecasts.
- Be alert to official drought disaster declarations. See “Disaster assistance” near the end of this section and refer to the **Resource Links** in appendix 5 for links to relevant Federal and State government offices.
- See “Drought monitoring” in the **Building a Resilient Operation** section for guidance and resources to help determine fertilization, herbicide, irrigation, and harvesting schedules and adapt to drought conditions.

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Crop considerations

Assess water requirements

- The water requirement for a soybean crop follows a bell-shaped curve, with water demand low at emergence, high at the beginning of reproductive growth, and then tapering off until maturity.
- During severe drought, irrigation cannot replenish soil moisture once depleted. Therefore, it is critical to know when each critical growth stage is reached and document it so that irrigation rates can stay on schedule (see table 1 in the **Building a Resilient Operation** section).
- Depending on the timing of the drought, its impact can be worse when your crop is not conditioned for it. For example, if May and June are relatively wet, a dry spell in August can be more damaging than if the same dry spell occurred after a dry May and June.
- Wilting is nearly always associated with yield penalties. In order to maximize yields, irrigate immediately if wilting is observed.
- See “Water requirements” in the **Building a Resilient Operation** section for a more detailed explanation of soybean growth stages and water demand.

Monitor for pests and diseases

- At planting, consider applying in-furrow granular or liquid insecticide/nematicide to create ideal conditions that will encourage rapid early-season growth and root development, thereby improving drought-hardiness.
- Increase monitoring and possible treatment of harmful insects, as insect pest complexes can change in drought-stressed soybean.
- If you are using cover crops, choose the species carefully. Cover crop species can sometimes have unintended consequences. For example, pea leaf weevils (*Sitona lineatus*) and three-cornered alfalfa hoppers (*Spissistilus festinus*) use legumes as a host. If legumes are used in the cover crop and the cover crop is terminated too close to planting, these pests can devastate soybean seedlings. Furthermore, cover crops can sometimes serve as important bridge hosts for later-season soybean pests. For example, crimson clover (*Trifolium incarnatum*) is an important developmental host for corn earworms/soybean podworms (*Helicoverpa zea*) early in the season before they move into crops. Widespread plantings of crimson clover could drive up corn earworm populations early in the season, leading to higher populations later in the season.
- See “Pest and disease concerns” in the **Building a Resilient Operation** section for resources to help you identify and treat pests and wilt diseases that commonly impact soybean health and productivity.

SECTION 2: ADAPTIVE ACTIONS DURING A DROUGHT

Saltwater intrusion considerations

- Farms near the Atlantic and Gulf Coasts or upstream from saline water bodies (such as the Lower Mississippi River Basin) are susceptible to saltwater intrusion during severe drought due to saltier water moving into aquifers and up waterways (e.g., rivers and drainage ditches).
- Saltwater intrusion can negatively impact soybean growth and yield and usually requires flushing of soil with freshwater from rainfall or irrigation to restore field productivity.
- Contact your local Extension office if you suspect your crops have been damaged by saltwater.
- To learn more about saltwater intrusion and how it may impact your crop, see the USDA Southeast Climate Hub [Saltwater Intrusion and Salinization on Coastal Forests and Farms website](#) (USDA FS 2021).

Harvesting considerations

- Timing is important and growers try to avoid harvesting during wet fall weather, which can negatively affect yield and quality.
- In dryland soybean fields, growers must decide whether to harvest or terminate the crop and take the insurance payment.
- As mentioned throughout this guide, contact your crop insurance agent if you think a claim is warranted, but do so well before harvest. DO NOT harvest until your agent can observe the field and your records.
- Some policies require the crop to be destroyed and not harvested. However, if the field is to be harvested, dry conditions during harvest are preferable because they preserve yield and quality.
- Be alert to an increased chance of seed shattering in plants that have died prematurely. During drought, pods may dry faster than anticipated or crop dry-down may happen more quickly.
- Combines equipped with yield monitors are a recommended precision agriculture tool. Make sure that yield monitors are properly calibrated before beginning harvest.
- Dry weather and low humidity can increase the fire hazard risk from combines. Being prepared with proper training of field hands on the use of fire extinguishers and other firefighting equipment is essential in preventing harvesting equipment losses or injury due to picker fires.

Soil considerations

- Soil moisture and evaporative stress are important factors during the growing season. If you have a conservation plan with NRCS, following that guidance will help reduce crop stress during drought.

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- Adequate soil fertility improves crop resilience. To bolster soil nutrients, growers should decide about fertilizer quantity and application frequency during different growth stages. Topdressed fertilizer applications followed by rainfall will help move potash into the soil. This is crucial for potassium deficient soybeans that are more susceptible to drought stress.
- Depending on weather conditions, growers fertilizing dryland fields will need to adjust their rate of application in comparison to irrigated fields.
- See “Improving soil health and drought resilience with NRCS” in the **Building a Resilient Operation** section if you do not already have a plan.

Water management

Irrigation

- The objective of irrigation is to stay ahead of a crop’s watering needs to avoid wilt, while at the same time not overwatering, which can damage roots. Insufficient water causes wilt at the first bloom stage, and yields will suffer even if water is sufficient for the rest of the year. Use a soil moisture sensor/probe to help you monitor soil moisture in your field and make informed decisions.
- Monitor irrigation lines for leaks and repair them as soon as possible.
- Monitor and document water levels in ponds, the energy usage of irrigation systems, and the amount of water applied per unit of time. This monitoring can help refine practices from year to year and sometimes reduce costs.
- Irrigation rates and timing are the only practices that can be adjusted during the growing season.
- See “Irrigation” in the **Building a Resilient Operation** section for guidance and resources to help you implement your water management strategy.

Stormwater capture

- During the summer months, monitor retention pond levels and water usage. If possible, run wells to help replenish ponds.
- See “Stormwater capture” in the **Building a Resilient Operation** section for guidance and resources to help you plan effective methods to utilize rainfall and runoff.

Recordkeeping, documentation, and insurance

- It is important to record observations concerning drought throughout the season to help document impacts and make adjustments for the following season.
- Document the timing and severity of wilting with photos and field notes.
- Contact your insurance agent as soon as a problem is noticed to begin the insurance claims process (Federal or private, or both). This can facilitate filing claims during significant drought events. Accurate levels of loss may not be fully documented yet, but start the

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paperwork immediately because insurance claims can take months to resolve following drought events.

- On dryland fields, it is essential to contact your insurance agent promptly when drought may impact yield to the point of collecting crop insurance. Waiting too long to contact the agent, especially if rainfall resumes, may make filing insurance claims more difficult. A simple phone call can initiate a field visit by an adjuster in case a claim needs to be filed later.
- Always contact your agent before harvesting your crop if you need an insurance claim. This action is essential if you are the only grower in your area or one of the few growers planning to file a claim.

Drone usage

- If you own and have a license to operate a UAV (i.e., drone), utilize it now to take aerial photographs of the damage to your fields. Some local Extension offices may have access to drones and personnel with a drone pilot license to assist you.
- See “Drones” in the **Building a Resilient Operation** section for guidance on the best way to utilize drone technology.

Contributing to the CMOR system

- Continue reporting your conditions in the CMOR system.
- See “Contributing to the Condition Monitoring Observer Reports system” in the **Building a Resilient Operation** section for guidance and resources to help you report your drought condition.

Responding to a crop failure

If crop failure (the point at which it is no longer economical to harvest) is likely, consider some cost-saving efforts. Herbicide application can usually be done cheaply but requires moisture for weeds to respond. Post-harvest desiccation or burndown of weeds may be necessary to reduce the seedbank for the following year.

Disaster assistance

- The availability of many disaster assistance programs is based on the intensity and impact of drought as designated by the [U.S. Drought Monitor](#) (NDMC, USDC, USDA 2025). Drought monitor maps are released each Thursday at 8:30 a.m. eastern time.
- Communicate early and often with disaster assistance contacts. Note that assistance will vary from one drought to the next and one budget year to the next.
- Call your local USDA FSA Office to report any losses or damages, and inquire about available assistance programs, application procedures, and deadlines. To find local FSA offices, see the Farmers.gov [USDA Service Center website](#) (USDA FG 2025b).

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- To learn more about USDA Disaster Assistance Programs that may help you during a drought, see:
 - [Noninsured Crop Disaster Assistance Program](#) (NAP) (USDA FSA 2025a)—FSA program that provides assistance for eligible farmers who suffer losses or are prevented from planting agricultural commodities that are not eligible for protection by Federal crop insurance.
 - [Emergency Conservation Program](#) (ECP) (USDA FSA 2025b)—FSA program with technical assistance through NRCS that helps eligible farmers and ranchers repair damage to farmlands caused by natural disasters and implement emergency water conservation measures in periods of severe drought

Long-term drought (drought lasting longer than one season or multiple years)

- A drought that persists and exceeds one season is a serious issue regardless of the crop grown. In many cases, little can be done until sufficient rainfall resumes, which will likely require many rain events over a long time to recharge ponds, reservoirs, and ground water.
- Be aware that diseases and insect pests typically associated with mid- to late-season drought conditions may become problematic earlier in the growing season, so monitor your fields early and respond appropriately.
- Depending on the severity and length of the drought, growers may choose not to treat insect populations if the reduced yield of the soybean crop will not pay for the application.
- Long-term drought conditions may result in water restrictions in some regions. Although agricultural water applications are often prioritized over other uses, in severe droughts even those may be restricted.

SECTION 3

Drought Recovery (Post-Drought)

Once a disaster designation is declared or drought conditions are no longer negatively impacting your crop (the drought is over), take the following actions to begin the recovery process



Farmer examining soybean pods to assess conditions, including ripeness. (Courtesy photo by USDA Flickr.com)

Personal health and well-being

Complete or partial loss of a crop to drought is stressful. It is crucial to take care of yourself and maintain your physical, mental, and emotional well-being when recovering from drought. See “Personal health and well-being” in the **Adaptive Actions During a Drought** section for Federal and State resources to help you through this stressful time.

Communications

- Consistent communication with your local Extension agent offers outside professional input into crop management strategies.
- Contact your Extension agent to review management protocols and production data from the drought period.
- Use your Extension agent’s input to adjust management practices and other protocols for future drought.

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- Early and constant communication (including post-drought) with your crop insurance provider and adjuster, local USDA [Farm Service Agency \(FSA\) Office](#) (USDA FG 2025b), and Risk Management Agency (RMA) can help increase the efficiency of processing insurance and disaster assistance claims.
- See the **Resource Links** in appendix 5 to find local Extension offices and other State and Federal resources that you may consult for further guidance.

Water management

- After a dry summer, retention ponds must recharge during the winter and spring. Ponds that cannot fully recharge will have limited usefulness during the growing season.
- If possible, run wells to help replenish ponds.

Recordkeeping, documentation, and insurance

Recordkeeping

- Keep a notebook throughout the recovery period for future use and considerations regarding any alteration to management practices. Describe the work you did and record all expenses. This includes keeping a log of contacts regarding conversations with insurance, State, and Federal agency contacts to create a record of your recovery efforts that can be used later as documentation for disaster assistance programs.
- It is recommended to have a second person involved in the conversations so that one can ask questions and the other can take notes. This will provide a second viewpoint of the discussion and reduce inaccuracies.

Documenting damage

Photo and video documentation

- The phrase that a “picture is worth a thousand words” holds especially true when documenting drought losses.
- Take photos or videos of damaged crops before beginning any harvesting. Make notes describing what is in the pictures and where they were taken. Having a time stamp will be helpful. This “after” documentation will be used with your predrought “before” documentation to clearly show your losses.

Drone usage

- If you own and have a license to operate a UAV (i.e., drone), and you have not done so already, utilize it now to take aerial photographs of the damage to your fields. Some local Extension offices may have access to drones and personnel with a drone pilot license to assist you.
- See “Drones” in the **Building a Resilient Operation** section for guidance on utilizing drone technology.

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Estimating losses

- Both the quality and quantity of your crop will be impacted during drought. Besides harvesting promptly, there is very little growers can do in terms of management to protect quality. Growers are likely to receive a lower price at the elevator for poor-quality soybeans.
- Combines equipped with yield monitors should be used whenever possible. Collecting yield data on yield monitors from year to year allows you to see the losses suffered in a drought compared to a year with normal precipitation.
- Yield estimates provided by the Extension office should be compared to estimates from your crop insurance adjuster. Ultimately, the insurance adjuster's estimate will be used to make any payment.
- Yield or potential yield loss should be documented with photos, receipts, data, and rainfall records.
- Growers with a production history should document their yields every year. Records from non-stressed years can be compared to current yields to help estimate loss due to drought.

Insurance claims process

- Continue the insurance claims process (Federal or private, or both) with your Agent.
- Some policies do NOT allow harvesting to be conducted when making a claim. Ensure you know all procedures and rules and contact your agent when you first observe a problem.

Contributing to the CMOR system

- Continue reporting your conditions in the CMOR system even though the drought has ended.
- See “Contributing to the Condition Monitoring Observer Reports system” in the **Building a Resilient Operation** section for resources and references to help you report your drought condition.

Disaster assistance

- The availability of many disaster assistance programs is based on the intensity and impact of drought as designated by the [U.S. Drought Monitor](#) (NDMC, USDC, USDA 2025). Drought monitor maps are released each Thursday at 8:30 a.m. eastern time.
- Communicate early and often with disaster assistance contacts. Check in with them throughout the recovery process. Note that assistance will vary from one drought to the next and one budget year to the next.
- Call your local USDA FSA Office to report any losses or damage and inquire about available assistance programs, application procedures, and deadlines. To find local FSA offices, see the Farmers.gov [USDA Service Center website](#) (USDA FG 2025b).
- Check in with your local Extension office, USDA agencies, and the State Department of Agriculture to see what assistance may be available following the drought.

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- Consult the following resources:
 - FEMA, [Disaster Recovery Center Locator](#) (USDHS FEMA 2025a) and [Individual Assistance website](#) (USDHS FEMA 2025b) to find the closest recovery center and other resources to assist you during your recovery
 - USDA, [Disaster Resource Center website](#) (USDA DRC 2025) for updates on emergency designation areas and available assistance programs
 - Farmers.gov, [Protection and Recovery website](#), including the five-step [Disaster Assistance Discovery Tool](#) to learn which USDA disaster assistance programs are available to assist you with your recovery (USDA FG 2025c)
 - U.S. Department of Labor, [Disaster Unemployment Assistance Program website](#) (USDLETA 2025).
- To learn more about USDA Disaster Assistance Programs that may be right for you, see:
 - [Emergency Farm Loans](#) (USDA FSA 2025c)—FSA program that provides eligible farmers and ranchers low-interest loans to help them recover from production and physical losses
 - [Disaster Set-Aside Program](#) (USDA FSA 2025d)—FSA program that allows eligible FSA borrowers to skip an annual installment payment and move it to the end of the loan repayment period
 - [Noninsured Crop Disaster Assistance Program](#) (NAP) (USDA FSA 2025a)—FSA program that provides assistance for eligible farmers who suffer losses or are prevented from planting agricultural commodities that are not eligible for protection by Federal crop insurance
 - [Emergency Conservation Program](#) (ECP) (USDA FSA 2025b)—FSA program with technical assistance through NRCS that helps eligible farmers and ranchers repair damage to farmlands caused by natural disasters, including severe drought.

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APPENDIX 1

Drought Plan

Drought preparedness is essential for improving operational efficiency, profitability, and sustainability. A critical step in drought preparedness is developing a drought plan. A Drought Plan, customized for your location, should outline available resources, key responsibilities and tasks for each person, and decision-making tools based on drought severity and duration. Although drought is often thought of as a slow progression, during high temperatures the effects of drought may be seen within a few days to a week (i.e., flash drought). Having a plan to help prioritize and guide you through management decisions can improve efficiency and enhance sustainability.

The following template should be tailored to your operation. Work with your local Extension agent or NRCS office (or both) to develop this into a useful working document. Some overlap will be seen with tasks listed in the **Building a Resilient Operation** section. This plan should guide you through tasks and decisions as drought conditions begin and worsen. Additional information may also be found in the **Initial Site Planning** guidance in appendix 4.

Basic information

Your drought plan should include basic information about your operation: name, date, location, contact information, crop(s) being grown, date crop(s) were planted, anticipated date of harvest, number of irrigated acres, and number of dryland acres. Attach aerial photograph(s) of your property and include information about each management area (e.g., crop, soil type, irrigated or non-irrigated).

Pre-drought operation and inventory

Tracking weather conditions

Routinely observe and record onsite or nearby measurements of temperature, precipitation (or lack thereof), and soil moisture. Use these measurements to monitor drought and make crop management decisions. Your drought plan should include a list of nearby weather data sources. Refer to the **Resource Links** in appendix 5 for reliable sources of data in your State.

Consider becoming a [Community Collaborative Rain, Hail & Snow Network](#) (CoCoRaHS) precipitation observer. Through CoCoRaHS, you can monitor and report precipitation on your farm and help improve precipitation data quality and forecasting.

Water sources and irrigation system capacity

List your sources of water in the drought plan. Consider your access to streams and surface water sources, well water, or water supplied by a municipality. If applicable, your drought plan should also include details of your irrigation system. Consider the capacity of your irrigation system and if any tests or maintenance is required to ensure its proper operation.

APPENDIX 1: DROUGHT PLAN

Equipment and field labor

Include an outline of available and needed equipment and people, and where equipment will be moved or sourced. As a starting point, consider including items needed for irrigation and soil moisture monitoring, retention pond pumps, pest control chemicals (herbicides, fungicides, and pesticides), imaging equipment (drones and cameras), harvesting equipment, hand tools, and a laptop or notebook for recordkeeping. Additional people may also need to perform temporary tasks such as helping with irrigation, transportation, operating farm equipment, and scouting for signs of pests and disease.

Key contacts

Complete the Contacts List in appendix 3 by adding the names and phone numbers of emergency personnel, insurance agents, contractors, suppliers, and Federal, State, and local agencies. Keep a copy of this list with your drought plan so that your important information is together in one place and readily available.

Important considerations during the drought

Your drought plan should consider the following questions and actions as drought develops and worsens:

Crop considerations

- How are you monitoring conditions on your farm?
- How are you monitoring soil moisture and crop stress?
- What methods will you use to determine when to irrigate (e.g., feel method, soil moisture sensors, visual crop stress indicators, crop susceptibility factors, remote sensing, potential evapotranspiration)?

Water considerations

- What is the condition of surface water sources on your land?
- What will you do if pond or stream levels get too low?
- If you use a municipal water supply, are there regulations that govern its use?
- What steps are required to make your irrigation equipment ready for use?
- If there is no rainfall, how frequently will you need to irrigate?
- Keep detailed records of irrigation system usage.

APPENDIX 1: DROUGHT PLAN

Drought impacts

- Bookmark and view the weekly [U.S. Drought Monitor](#) to remain current on drought conditions and designations in and around your county.
- How will you determine when to harvest?
- How will you determine loss of crop yield and the impact on quality?

Insurance and disaster assistance help

- Begin the insurance claims process (Federal or private, or both). Contact your insurance agent to facilitate filing claims.
- Stay in touch with Federal and State agencies to learn about disaster assistance that may be available to you.

Other drought plan considerations

- Do you live in an area where water resource allocation is an issue?
- Can you incorporate other soil moisture management methods (e.g., cover crops, deficit irrigation, stormwater management, planting date, crop variety selection, soil moisture monitoring)?
- Consider emerging practices for responding to drought (e.g., drainage water recycling, alternative irrigation water sources, deficit irrigation decision-making).
- What lessons from previous droughts can you incorporate into your drought plan?

APPENDIX 1: DROUGHT PLAN

Drought Plan Template

Basic information

Name _____ Date _____
Location _____ Contact info _____
Crop(s) grown _____ Irrigated acres _____
Estimated harvest date _____

Operations and inventory

List weather data sources

List nearby water sources and irrigation system details

List equipment and labor needs

List contact information for key personnel, suppliers, and agencies

Crop concerns and drought response

Soil and crop considerations

Water considerations

Yield impact and harvesting considerations

Insurance and disaster assistance help

APPENDIX 2

Seasonal Decision Tables

Spring decisions, drought considerations, and resources

Decision topic	Drought impacts on decision considerations	Decision information needs	Tools/Data/Resources to help growers make the decision
Variety selection	While growers may have already ordered seed, increasing indications of a dry growing season may lead them to cancel and modify orders through March or April. Later-maturing group varieties may be more resilient to drought, but if long-term forecasts indicate a late-year drought, earlier maturing group varieties may be a better choice.	Current drought status and short-term forecasts may indicate the expected planting conditions. The seasonal drought outlook will reflect likely conditions for the upcoming growing season.	• Drought.gov U.S. Drought Portal Local Drought Information • U.S. Drought Monitor Current Drought Conditions • Climate Prediction Center Outlooks
Seeding density	Growers may decrease seeding density to maximize yield when drought is expected. Dry conditions increase the difficulty of crop establishment and lower yield. Check with the manufacturer regarding specific planting density modifications.	Use the seasonal drought outlook to understand possible conditions for the upcoming growing season, including planting.	• Climate Prediction Center Outlooks
Pre-planting weed control	Warm/dry winters can increase weed pressure in fields, increasing the need for weed control. In such conditions, effective early termination of winter cover crops and elimination of weeds will help conserve available soil moisture. Severe drought stress may reduce the efficacy of some herbicides and lack of rainfall can diminish the activation of residual herbicides.	Conduct in-field weed monitoring. Short-term forecasts can help with decisions about the timing of pre-planting weed control.	• National Weather Service Local Forecasts
Planting date	Crops need sufficient soil moisture and temperature for germination. Growers may delay planting if conditions are inadequate and expected to improve in the future. Conversely, if adequate soil moisture is available in mid- to late April, most growers should proceed with planting unless temperatures are unusually cool.	Consult soil moisture and temperature trends throughout late winter/early spring and short-term precipitation and temperature forecasts.	• National Weather Service Local Forecasts • Weather Prediction Center Quantitative Precipitation Forecasts (QPF) • Drought.gov Soil Moisture Dashboard • See “Soil moisture” in the Building a Resilient Operation section.

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APPENDIX 2: SEASONAL DECISION TABLES

Decision topic	Drought impacts on decision considerations	Decision information needs	Tools/Data/Resources to help growers make the decision
Pest control	Growers may consider whether nematicides should be applied in-furrow (while planting) to control nematodes. Warm/dry winters may allow nematode populations to increase.	Monitor in the field and track drought and temperatures.	• U.S. Drought Monitor Current Drought Conditions • National Weather Service Local Forecasts • If you have not done so already, test soil for nematode risk: See “Pest and disease concerns” in the Building a Resilient Operation section. • Use the results from your soil analysis to determine the need for nematicide application.
Fertilization	Growers make decisions about fertilizer quantity and application frequency during different growth stages.	Monitor soil moisture and short-term precipitation forecasts.	• National Weather Service Local Forecasts • Weather Prediction Center QPF • Drought.gov Soil Moisture Maps
Crop scouting for pests	Growers must decide when to start scouting for pests (or when to hire crop scouts). Dry/warm winters may increase or overwinter pest populations, so growers should be proactive in scouting.	Monitor winter drought and temperature conditions and conduct in-field monitoring for pests.	• U.S. Drought Portal local conditions • U.S. Drought Monitor Current Drought Conditions • National Weather Service Local Forecasts

Summer decisions, drought considerations, and resources

Decision topic	Drought impacts on decision considerations	Decision information needs	Tools/Data/Resources to help growers make the decision
Fertilization	Growers decide how much fertilizer should be applied and when. Topdressed applications benefit from rainfall that moves potash into the soil. Dryland soybean growers may adjust fertilizer amounts during drought.	Monitor precipitation and drought status between the first bloom and pod set.	• Drought.gov • U.S. Drought Monitor Current Drought Conditions • Weather Prediction Center QPF
Irrigation timing and amounts	Growers decide when to start irrigating and how much to irrigate, though a low percentage of soybean in the Southeast is irrigated. The objective is to stay ahead of a crop's watering needs to avoid wilt, while at the same time not overwatering, which can damage roots. If insufficient water causes wilt at first bloom stage, yields will suffer even if water is sufficient the rest of the year. Flash drought can have a significant impact. Once plants are visibly wilted, damage is done. The risk continues throughout the season.	Proactively monitor soil moisture and precipitation forecasts and evapotranspiration (ET). Irrigation apps help but assume an average growth curve with no root obstruction. In severe, prolonged drought, sustaining normal crop yield and productivity is difficult, even with good irrigation.	• Drought.gov Soil Moisture Maps • Weather Prediction Center QPF • National Weather Service Local Forecasts • Drought.gov ET Stress Index • Smart Irrigation Apps CropFit App
Dryland fields – the decision to abandon crop or chop for silage or hay?	Generally, dry conditions lead to yield loss. Growers need to decide whether to harvest or terminate the crop and take the insurance payment.	Consider local drought status and outlook through the fall.	• Drought.gov • U.S. Drought Monitor Current Drought Conditions • Climate Prediction Center Drought Information

APPENDIX 2: SEASONAL DECISION TABLES

Fall decisions, drought considerations, and resources

Decision topic	Drought impacts on decision considerations	Decision information needs	Tools/Data/Resources to help growers make the decision
Harvest timing	Harvest timing is important to avoid wet conditions and maximize potential yield. In general, dry weather is better for harvest. Wet fall weather can negatively affect yield and quality (e.g., stained, shrunken, or off-color seed).	Consider short-term precipitation forecasts and longer-term precipitation outlooks when scheduling harvest.	- Weather Prediction Center QPF - Climate Prediction Center Outlooks
Cover crop planting	Growers typically grow small grains or legumes (or both) as fall cover crops. There is usually enough moisture in the fall for cover crop germination, eliminating the need for irrigation. The timing of planting should coincide with available soil moisture.	Consult precipitation forecasts to determine the timing of cover crop planting.	- National Weather Service Local Forecasts - Weather Prediction Center QPF
Pest control	Growers expecting a dry and warm winter may anticipate the possibility of increased insect or nematode pressure, requiring additional pesticides. Historically, La Niña conditions have resulted in warmer, drier winters.	Consult seasonal temperature and precipitation forecasts. El Niño Southern Oscillation (ENSO) predictions provide the likelihood of El Niño, La Niña, or neutral conditions.	- U.S. Drought Monitor Current Drought Conditions - National Weather Service Local Forecasts - Test soil for nematode risk: See "Pest and disease concerns" in the Building a Resilient Operation section.

Winter decisions, drought considerations, and resources

Decision topic	Drought impacts on decision considerations	Decision information needs	Tools/Data/Resources to help growers make the decision
Ordering agrichemicals (herbicides, pesticides, and fertilizer) for the next growing season	If a dry and warm winter is forecasted, growers should expect the possibility of increased insect or nematode pressure, requiring additional pesticides. Historically, La Niña conditions have resulted in warmer, drier winters.	Consult seasonal temperature and precipitation forecasts. El Niño Southern Oscillation (ENSO) predictions provide the likelihood of El Niño, La Niña, or neutral conditions.	- Climate Prediction Center ENSO - Climate Prediction Center Outlooks
Seed variety purchase	Growers order seeds in the winter but can modify their orders into spring. More drought-tolerant varieties could be used if a dry growing season is forecasted. La Niña conditions may indicate a higher likelihood of dry soils entering the next growing season.	Consult seasonal temperature and precipitation forecasts. El Niño ENSO predictions provide the likelihood of El Niño, La Niña, or neutral conditions.	- Climate Prediction Center ENSO - Climate Prediction Center Outlooks
Irrigation equipment maintenance	Maintenance and modifications may be especially critical to prepare for a forecasted dry growing season and increased irrigation demand. Maintenance and new installations may be done over the winter months.	ENSO predictions provide the likelihood of El Niño, La Niña, or neutral conditions and the persistence of these conditions. Drought outlooks are available for up to 3 months.	- U.S. Drought Portal (Drought.gov) Local Drought Information - Climate Prediction Center Outlooks - Climate Prediction Center ENSO

APPENDIX 3

Contacts List

You may customize this for your operation. Delete items that do not pertain to your commodity or location and add companies or organizations specific to your commodity.

Individuals

Name(s)	Role(s)	Phone number(s)	Notes
	Owner(s)		
	Members of the Drought Response team		
	Other key employees or managers		

Emergency Services

Organization	Name(s)	Phone number(s)	Notes
Emergency Management agency			
Emergency medical responders			
Fire Department			
Hospitals			
Law Enforcement			

Insurance Companies

Organization	Name(s)	Phone number(s)	Notes
Commodity insurance companies			

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Contractors and Suppliers

Organization	Name(s)	Phone number(s)	Notes
Electrical contractor			
Equipment dealer			
Equipment rental company (lifts, generators, etc.)			
Fuel supplier			
Generator servicing			
Mechanic			
Plumbing contractor			

Federal, State, and County Organizations

Organization	Name(s)	Phone number(s)	Notes
County Emergency Management Agency			
County Health Department			
Local Extension Office			
State Department of Agriculture			
USDA Farm Service Agency (FSA)			
USDA Natural Resources Conservation Service (NRCS)			
U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA)			

APPENDIX 4

Initial Site Planning

Considerations when deciding on a new location to establish or purchase farmland

Drought risk

Each growing season, the possibility of drought is on the mind of farmers and landowners across the Southeastern United States. Unless you have installed an extensive irrigation system, your crops will be at risk. If you are thinking of planting in a new field or purchasing additional acreage, there are some site characteristics to consider that will help you be better prepared to adapt to drought conditions in the future.

Site characteristics

Topography and soil type

- Choose a site with good drainage and surface topography characteristics for even distribution of rainfall and irrigation water.
- It is important to know the soil types on your land (soil type and drainage class affect the water holding capacity of the soil and the impact of drought). Consider soil textural class in any purchase. Sandy soils are more drought-prone and require more supplemental water than clay-based soils.

Water sources

- Choose land with surface water sources or good ground water sources. Having access to a pond or stream could be invaluable during drought conditions. Consider the capacity and depth to ground water supply for future irrigation systems.
- Consider limitations on the use of both ground water and surface water supplies. Some areas require permitting.
- Consider the quality of surface water and ground water sources. Be aware of potential issues with water sources (e.g., salinity, hardness, pH).
- Consider available State and Federal cost-share programs for developing irrigation water sources.

APPENDIX 4 INITIAL SITE PLANNING

Roads and utilities

- Ensure your site has reliable access to the electrical grid and water supply.
- Choose a site with good roads that will accommodate the movement of irrigation and harvesting equipment.
- If the area requires surface or subsurface drainage, can you incorporate a drainage water management system? Can you potentially utilize this system to capture water for irrigation during droughts?

Trees and windbreaks

- Strategically placed windbreaks will offer some protection to plants and soil and help reduce erosion.

Other factors

- Consider the history of the land and how it was previously used. If you are concerned about any areas of potential contamination, an environmental site assessment may be necessary.
- Does the land fall within city limits or a zoning area that may be subject to regulations?
- If possible, try to learn whether the property lies in the path of any plans for road construction or building projects that could impact your operation.

APPENDIX 5

Resource Links

Extension, State, and Federal websites

Alabama

Extension websites *	Purpose
Soybeans	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* Alabama Cooperative Extension System	
State websites	Purpose
Alabama Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Alabama Department of Agriculture and Industries	Main source for answers to your agriculture-related questions
Alabama Office of the State Climatologist	Primary source of weather and climate information in the State
Auburn University Water Resources Center and Alabama Agricultural Experiment Station Alabama Drought Reach	Provides drought communication and agricultural impact monitoring in the State; includes weekly drought summaries

Arkansas

Extension websites *	Purpose
Soybean	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* University of Arkansas Cooperative Extension Service	
State websites	Purpose
Arkansas Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Arkansas Department of Agriculture	Main source for answers to your agriculture-related questions

Florida

Extension websites *	Purpose
Soybeans	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* University of Florida IFAS Extension	

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State websites	Purpose
Florida Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Florida Department of Agriculture and Consumer Services	Main source for answers to your agriculture-related questions
Florida Climate Center	Primary source of weather and climate information in the State

Georgia

Extension* and university websites	Purpose
Soybeans *	Resources to help farmers improve soybean management and productivity
Extension Office Locator *	Contact information for Extension agents in your county
University of Georgia Weather Network homepage	Reports on current weather conditions from an automated network of stations, as well as historical data and applications

* University of Georgia Cooperative Extension

State websites	Purpose
Georgia Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Georgia Department of Agriculture	Main source for answers to your agriculture-related questions
Georgia Office of the State Climatologist	Primary source of weather and climate information in the State

Kentucky

Extension* and university websites	Purpose
University of Kentucky Department of Plant and Soil Sciences Soybeans	Resources to help farmers improve soybean management and productivity
Extension Office Locator *	Contact information for Extension agents in your county
Drought Resources *	Information and resources to assist in dealing with drought

* University of Kentucky Cooperative Extension Service

State websites	Purpose
Kentucky Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Kentucky Department of Agriculture	Main source for answers to your agriculture-related questions
Kentucky Climate Center	Primary source of weather and climate information in the State

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Louisiana

Extension websites *	Purpose
Soybeans	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
Drought Irrigation Response Tool (DIRT)	A webtool that provides irrigation scheduling guidance
Louisiana State University Louisiana Agriclimatic Information System	A network of automated weather stations that collect and share climatic data relevant to agricultural production in the State
* Louisiana State University AgCenter	
State websites	Purpose
Louisiana Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Louisiana Department of Agriculture and Forestry	Main source for answers to your agriculture-related questions
Louisiana Office of State Climatology	Primary source of weather and climate information in the State

Mississippi

Extension websites *	Purpose
Soybeans	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* Mississippi State University Extension Service	
State websites	Purpose
Mississippi Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Mississippi Department of Agriculture and Commerce	Main source for answers to your agriculture-related questions
Mississippi Office of the State Climatologist	Primary source of weather and climate information in the State

North Carolina

Extension websites *	Purpose
Soybeans	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* North Carolina Cooperative Extension	
State websites	Purpose
North Carolina Governor's Office	News and information from the Governor, including evacuation orders, safety orders, and emergency declarations
North Carolina Department of Agriculture and Consumer Services	Main source for answers to your agriculture-related questions
North Carolina State Climate Office	Primary source of weather and climate information in the State
North Carolina Drought Management Advisory Council	State-level drought monitoring, including weekly infographic updates

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South Carolina

Extension websites *	Purpose
Soybean	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* Clemson University Cooperative Extension Service	
State websites	Purpose
South Carolina Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
South Carolina Department of Agriculture	Main source for answers to your agriculture-related questions
South Carolina State Climatology Office	Primary source of weather and climate information in the State
South Carolina Drought.com	Current drought status and state-level information and resources to assist in dealing with drought

Tennessee

Extension websites *	Purpose
Crop Production Systems	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* University of Tennessee Extension	
State websites	Purpose
Tennessee Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Tennessee Department of Agriculture	Main source for answers to your agriculture-related questions
Tennessee Climate Office	A primary source of weather and climate information in the State; it also produces Weekly Drought Summaries

Virginia

Extension websites *	Purpose
Soybean Update	Resources to help farmers improve soybean management and productivity
Extension Office Locator	Contact information for Extension agents in your county
* Virginia Cooperative Extension	
State websites	Purpose
Virginia Governor's Office	News and information from the Governor, including evacuation orders and emergency declarations
Virginia Department of Agriculture and Consumer Services	Main source for answers to your agriculture-related questions
Virginia Department of Environmental Quality Drought	Important site that monitors hydrologic conditions in the State and issues drought guidance and declarations

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State (FSA and NRCS)

State FSA websites	Purpose	State NRCS websites	Purpose
USDA FSA Alabama		USDA NRCS Alabama	
USDA FSA Arkansas		USDA NRCS Arkansas	
USDA FSA Florida		USDA NRCS Florida	
USDA FSA Georgia		USDA NRCS Georgia	
USDA FSA Kentucky		USDA NRCS Kentucky	
USDA FSA Louisiana	Focus on State FSA resources, including financial and technical information sharing	USDA NRCS Louisiana	Focus on State NRCS resources, including financial and technical information sharing
USDA FSA Mississippi		USDA NRCS Mississippi	
USDA FSA North Carolina		USDA NRCS North Carolina	
USDA FSA South Carolina		USDA NRCS South Carolina	
USDA FSA Tennessee		USDA NRCS Tennessee	
USDA FSA Virginia		USDA NRCS Virginia	

Federal

Federal websites	Purpose
Regional Climate Centers: Midwestern (KY), Southeastern (AL, FL, GA, NC, SC, VA), Southern (AR, LA, MS, TN, TX)	The regional climate centers house climate maps, drought maps, precipitation summaries, and other climate monitoring information
U.S. Department of Agriculture (USDA)	News and announcements related to agricultural commodities and disaster recovery programs
USDA Disaster Resource Center	Resources to help you build long-term resilience to and recover from droughts and other disasters
USDA Farm Service Agency (FSA)	Assistance with securing loans, receiving payments, and applying for disaster relief programs
USDA Natural Resources Conservation Service (NRCS)	Financial and technical assistance for farmers, ranchers, and forest landowners
USDA Office Locator	Contact information for USDA offices in your county, including FSA, NRCS, Rural Development, and Conservation Districts
USDA Publications	Publications that summarize current weather, climate, and agricultural developments across the United States
USDA Risk Management Agency (RMA)	Assistance with Federal crop insurance and management risk
USDA RMA Agent Locator	Contact information for local RMA offices in your county
U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA)	Resources to view historical, current, and predicted drought activity and warnings in your area

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Federal websites	Purpose
NOAA National Integrated Drought Information System (NIDIS) Drought.gov	A multi-agency resource that coordinates drought monitoring, forecasting, planning, and information at national, Tribal, State, and local levels
NOAA NIDIS Drought.gov Evaporative Stress Index (ESI)	A good tool for assessing surface soil moisture and crop stress conditions; it is also useful for capturing early signs of flash drought
NOAA NIDIS Drought.gov Mississippi River Basin Drought & Water Dashboard	Timely information on past, present, and future drought conditions in the Mississippi River Basin
NOAA NIDIS Drought.gov Southeast Drought Early Warning System (DEWS)	An interagency effort to improve drought early warning capacity and build long-term drought resilience throughout the region
NOAA High Plains Regional Climate Center Applied Climate Information System Climate Maps	Maps showing a variety of past conditions, including precipitation, temperature, and departures from the long-term average
NOAA National Weather Service (NWS)	Current conditions, hourly forecasts, and daily forecasts for your area
NWS Drought Information Statements	Provides up-to-date reports on recent weather and hydrologic conditions, drought impacts, and drought outlooks
NWS Climate Prediction Center Drought Information	Provides monitoring tools and outlooks based on timeframe and location
NWS National Hurricane Center (NHC) Atlantic 7-day Graphical Tropical Weather Outlook	Describes the percent chance of tropical cyclone formation in the Atlantic basin during the next 7 days
NWS Weather.gov National Forecast Maps	Hourly and daily forecast maps of weather-related variables, including precipitation, temperature, and cloud cover
U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)	News and information to help you prepare for and recover from droughts and other disasters
U.S. DHS Ready.gov Drought	Resources to help individuals prepare for and recover from droughts
U.S. Department of the Interior Geological Survey (USGS) National Water Dashboard	Real-time water and streamflow data collected at USGS observation stations throughout the United States, with additional data layers that include recent and forecasted precipitation, temperature, and drought
U.S. Drought Monitor (USDM)	Shows drought location and intensity across the United States and its territories; the map is released every Thursday

Plumlee, M.; Reisig, D.; Poole, C.; Gorny, A. 2026. Soybean: A Producers Guide to Drought Preparation and Recovery in the Southeastern United States. (Gavazzi, Michael; McNulty, Steven; Britton, Stephen, eds.). Gen. Tech. Rep. SRS-287. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 60 p. <https://doi.org/10.2737/SRS-GTR-287>.

Drought is a natural part of the Southeastern United States climate and a threat to agricultural productivity and profitability. Whether slow developing or rapid onset, droughts can have negative effects on agricultural crops and livestock, depending on timing, severity, and length. Droughts are expected to become increasingly common in the Southeast due to increasing temperatures, longer dry periods between rain events, and growing water demand across the region. To help producers remain resilient and productive in the face of this threat, the U.S. Department of Agriculture (USDA) Southeast Climate Hub co-produced this guide to help soybean producers prepare for, manage, and recover from droughts.

KEYWORDS: farm planning, resilient agriculture, disaster recovery, adaptation, farm, crop, weather.



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