

 > Care > Weather > **Plants and Drought**

## Plants and Drought

### How to adapt and what's at stake

A drought has many implications for Florida residents, as it places pressure on our water supply and increases wildfire risk. It also poses challenges to vegetation—in your backyard, at your local farm and even in the wild.



Damaged corn during the 2012 drought. Photo by Dave Kosling, USDA. Some rights reserved.

Although many people might associate Florida with thunderstorms and hurricanes, this state is no stranger to dry weather. Our “dry season” is generally from fall to spring, with some prolonged periods of below-normal rainfall known as a *meteorological drought*. You might also notice periods when river and lake water levels are below normal, or hear that our groundwater level is low; this constitutes a *hydrological drought*<sup>1</sup>.

When a dry spell is serious enough to deplete soil moisture and injure plants, this period is known as an *agricultural drought*<sup>1</sup>, which will be the focus of this article. All of these drought conditions can be interwoven and often exist at the same time.

## How drought affects plants



These stressed plants have begun to wilt.

Severely dry soil conditions can lead to *drought stress* in plants. This occurs when the plant loses water faster than its roots can pull it in, and when its depleted water content negatively affects normal plant

processes.

When a plant is dealing with low or absent water availability, it will halt growth and reduce photosynthesis and other plant processes to conserve water. As the plant continues to lose water, the leaves of some species might change color, and foliage begins to wilt. If the plant goes too long without water, the leaves will fall off and the plant may perish.

### **What environmental factors affect drought stress**

Drought stress is triggered by certain environmental factors that affect the plant's water supply. It's about more than just rainfall or soil moisture—sunlight intensity and high temperatures also significantly increase a plant's water loss. When accompanied by high wind speed or low humidity, this loss can be even greater.

### **How long before drought stress develops**

Environmental conditions determine when drought stress appears. For example, soil texture can determine the water-holding capacity of the soil (sandy soils hold less water than clay soils). A limited root system can also exacerbate drought stress. In compacted soils there is not much space between the particles for water to travel or for the plant roots to extend downward. Potted plants can also have root limitations, as do plants with roots that are competing in crowded areas with other root systems. Plants with more leaf mass in relation to the root system may lose more water than they can take in.



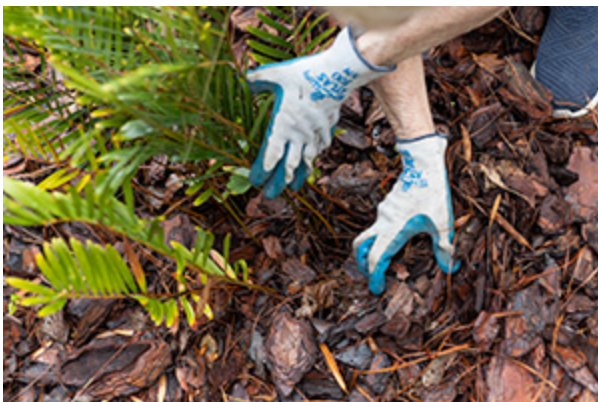
## How can you reduce effects of drought stress

To get ahead of the game, use Florida-Friendly Landscaping™ principles. Choosing the right plant for the right place can greatly increase the plant's chance of survival during a drought. If the environmental needs of the species are met (light, soil type, pH, etc.), then it can better withstand stressors like disease and extreme weather.

When establishing a plant, pay special attention to whether a species prefers shade or part shade, so as to avoid the effects of direct sun on sensitive plants. Since root systems compete for water, make sure you do not crowd your plants. Follow the recommended spacing suggestions when planting.

Another Florida-Friendly principle is to water efficiently. Using supplemental microirrigation with a rain-shutoff device

is recommended. When water is applied correctly and *only when needed*, it is more accessible to the plants. This also reduces likelihood of plant disease from overwatering. To be cognizant of when plants actually need water, you can inspect them for signs of water deficiency by looking for leaf rolling or wilting. Deep and infrequent watering encourages the plant to develop deeper roots to search for water, which aids the plant during dry periods. Overall, an efficiently hydrated plant is stronger in the face of drought stress.



Mulch helps plants retain water.

Using mulch also helps retain moisture in the soil and moderates the temperature of the root system. This offsets the effects of extreme heat and rain deficits. Since wind speed can affect the intensity of heat stress, it's beneficial to

create windbreaks with shrubs or structures in areas with high wind.

Another way to reduce the severity of drought stress is to plant drought-resistant species. These plants have proven themselves when it comes to droughts. This does not mean they never need to be watered, it just means they have a higher chance of recovery when dealing with drought. It's important to note that *all plants* will suffer during extended drought, but those Florida-Friendly plants tolerant of the conditions (when planted in the right place) will be more likely to withstand it.

## Characteristics of drought-tolerant plants

Drought-tolerant plants are particularly resilient because they evolved in arid regions or areas that experience frequent drought. Places with soils of low water-holding capacity, like many regions in Florida, will have plants that developed a tolerance for dry conditions.



Succulents have fleshy leaves that are efficient for storing water.

Some plants have physiological or anatomical characteristics that make them better able to manage during a drought. Certain species have developed an exceptionally thick “cuticle,” or waxy coating on their leaves, that

reduces the amount of water lost to evaporation. Even leaf hairs can reduce evaporation by limiting the movement of air at the surface of the leaf. Thicker leaves and smaller leaves prevent excess water loss by reducing the surface area of the plant exposed to the atmosphere.

Some species are “drought deciduous” and have adapted to drought by dropping their leaves during drought and then regrowing them when the conditions are more favorable. Plants with large root systems near the surface can quickly absorb rainfall, while deep root systems can reach water tables.

## Drought-tolerant plants for Florida

For a full list of drought-tolerant plants, use the “custom filter” feature of the free web app, [UF/IFAS Florida-Friendly Landscaping™ Plant Guide](#). Below are some popular and noteworthy drought-tolerant plants:

- **Agave**
- **Aloe** (*Aloe Vera*)
- **Beach sunflower** (*Helianthus debilis*)
- **Beautyberry** (*Callicarpa americana*)
- **Bougainvillea**
- **Bromeliads**
- **Cabbage palm** (*Sabal palmetto*)
- **Coontie** (*Zamia integrifolia*)
- **Crapemyrtle** (*Lagerstroemia* spp.)
- Dwarf natal plum (*Carissa macrocarpa*)
- **Firebush** (*Hamila patens*)
- **Gaillardia/blanket flower** (*Gaillardia pulchella*)
- **Junipers:** shore juniper (*Juniperus conferta*), Chinese juniper (*Juniperus chinensis*), creeping juniper (*Juniperus horizontalis*)
- **Live oak** (*Quercus virginiana*)
- **Muhly grass** (*Muhlenbergia capillaris*)
- **Pindo palm** (*Butia odorata*)
- Purple heart (*Tradescantia pallida*)
- **Rosemary** (*Salvia rosmarinus*)
- **Sand pine** (*Pinus elliottii*)
- **Seagrape** (*Coccoloba uvifera*)
- **Red cedar** (*Juniperus virginiana*)
- Twinflower (*Dyschoriste oblongifolia*)
- **Wild coffee** (*Psychotria nervosa*)
- **Yaupon holly** (*Ilex vomitoria*)



Purple heart has a sprawling habit making it ideal for hanging baskets and mass plantings.

## ■ Yucca

# How drought is changing



Lake Mize in the Austin Cary Forest in 2017.

Evapotranspiration, which results in water loss to the atmosphere, increases with high temperatures. This dries out the soil and is especially harmful to plants during periods of low rainfall. Since global

temperatures are rising over time, the planet will likely experience worsening drought conditions<sup>2</sup>.

While meteorological predictions suggest some areas will be experiencing increased rainfall and others will have a reduction in rainfall, this is not a reliable indicator of drought trends. For example, increases in heavy precipitation and decreases in light to moderate rain can lead to more runoff and less water uptake by plants<sup>3</sup>.

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Understanding how to combat drought stress in the landscape can help you prepare your plants for dry conditions. Taking measures to create a more resilient garden will lead to more productive and healthy plants.

## Also on Gardening Solutions

- [Improving Your Lawn's Drought Tolerance](#)
- [Super Drought-tolerant Plants](#)
- [Tough Plants](#)
- [Tree Care During Drought](#)
- [What is Drought?](#)

## More from UF/IFAS

- ***Carissa macrocarpa* Dwarf Natal Plum–Ask IFAS**
- **Drought-tolerant Native Plants for Central Florida–UF/IFAS Blogs Hillsborough County**
- **Purple heart: a truly purple evergreen–UF/IFAS Blogs Charlotte County**
- **Tree Care and Drought–UF/IFAS Landscape Plants**
- **Twinflower, *Dyschoriste oblongifolia*–Florida Museum**
- **Video: Drought Tolerant Plants–UF/IFAS Extension Manatee County on YouTube**
- **Why choosing drought tolerant plants for our growing zone is more important than ever–UF/IFAS Blogs Duval County**



Coontie plants are a host plant of the rare Atala butterfly.

## Citations

1. van Hateren, T. C., Chini, M., Matgen, P., & Teuling, A. J. (2021). Ambiguous Agricultural Drought: Characterising Soil Moisture and Vegetation Droughts in Europe from Earth Observation. *Remote Sensing*, 13(10), 1990. <https://doi.org/10.3390/rs13101990>
2. Strzepek, K., Yohe, G., Neumann, J., Boehlert, B. (2010). Characterizing Changes in Drought Risk for the United States from Climate. *Environmental Research Letters*, 5(4), 044012. <https://doi.org/10.1088/1748-9326/5/4/044012>
3. Dai, A. (2011). Drought Under Global Warming: a Review. *WIREs Clim Change*, 2, 45-65. <https://doi.org/10.1002/wcc.81>

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