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PROTECTING LANDSCAPES DURING A DROUGHT

Presented by
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This year the Our Water Our World Program helped its partner stores meet the challenges of the drought head on with a proactive approach by creating a set of guidelines for monitoring for plant stress and strategies for protecting landscapes.

Our Water Our World IPM Advocate and Master Educator Debi Tidd created a hand out that would reach far and wide not only included in training folders, literature racks, and outreach events, but in nursery newsletters, garden club blogs, and online news forums.

It has become so popular that we would like to share it with you in hopes you will use it in your stores.



Debi Tidd, IPM Advocate and Master Educator

Droughts can be part of our natural weather cycles. But when drought conditions persist for long periods of time, it can significantly impact plant health in a number of ways. Lack of water limits a plant's ability to produce food, and stressed plants can release chemicals that can attract pests. Excessive heat can accelerate the reproduction time of pests. But there are a number of strategies that can help protect plants during extensive drought conditions.

How Plants React During a Drought

When a plant is stressed from lack of moisture, it closes the pores (stomata) in its leaves to reduce water loss. As a result,

the plant does not absorb the carbon dioxide it needs for photosynthesis. The lack of water also limits the plants ability to move food and essential minerals around. Both these factors limit the plant's ability to grow and develop, so plants may show stunted growth, chlorotic leaves, leaf drop, a thinning crown, or poor shoot growth. It may take trees and large shrubs a couple of years to recover following a severe drought.

Pests and Diseases

During fall and winter, rain can help wash insect pests like mites and aphids from plants, and cool temperatures keep pests from reproducing. But during a drought, warm temperatures can accelerate pest reproduction rates and the pests can quickly outnumber the populations of beneficial insects that prey on them.

When plants are water-stressed they produce fewer defensive compounds which makes them more susceptible to pests. Some plants may even begin to emit chemicals, such as ethanol and alpha-pinene, which can actually attract pests like borers and bark beetles. Some insect pests, such as spider mites and whitefly, flourish in dry, dusty conditions and their populations may increase during a drought. Nutrients may be more concentrated in water-deficient plants, providing a substantial food source for these pests.

Some plant diseases, such as canker diseases, usually affect older or drought-stressed trees and shrubs. But fungal diseases that usually live on dead wood can invade living tissues when plants are moisture stressed, causing dieback in younger plants.

Drought Stressed Trees

There are many factors that impact a tree's ability to survive a drought, such as the length of the drought, the plant species, and how well the soil holds water and nutrients. Other environmental stresses may impact the plant as well, such as competing with turf for water, heat from pavement and buildings, soil compaction, and air pollutants. Symptoms of drought stress include wilting, leaf drop, chlorosis, leaf margins that turn brown, stunted new growth, browning and loss of needles on conifers, and eventually twig and branch dieback.

Drought stressed trees can attract insect pests and diseases such as borers, bark beetles, and cankers. Borers are common in drought-stressed plants. As they feed on the tree's inner bark, their tunnels inhibit the movement of water and nutrients. Bark beetles are common on conifers like pines. Their tunnels can impede the plants ability to transport water and they sometimes bring in a fungus which speeds up the plant's decline.



Strategies for Protecting Plants During a Drought

- **Drought-Resistant Plants**
Choose plants adapted to having less-water and drier conditions. You may be able to get a list of recommended plants from your local University Extension Service or water district.
- **Install Efficient Irrigation Systems**
Even water-wise plants will need water to get established. Drip irrigation systems or soaker hoses for trees and shrubs can substantially cut down on water loss and be more efficient in delivering water directly to a plant. Water early in the morning when there is less wind creating evaporation, and water less often and more deeply to encourage deeper roots. In many areas, water providers offer rebates for installing efficient irrigation systems.
- **Apply Mulch**
Covering the soil with a layer of organic material like wood chips, bark, straw and leaves, can have a huge impact in the health of plants and the landscape. The mulch reduces water loss through evaporation, feeds the soil organisms, keeps weeds from germinating, and improves the soil's ability to hold moisture. Apply 2" to 4" of mulch around plants, but keep the mulch 2" to 3" away from the stem or trunk of a plant.
- **Reduce Fertilization**
Applying fertilizer during a drought will not necessarily encourage plant growth, because lack of water limits the plant's ability to take up nutrients and move them around in the plant. In addition, high salt fertilizers can actually injure the plant when the salts build up in dry soils. To help minimize the stress of drought and maintain

soil fertility, use organic, slow release fertilizers. These will be most effective when the rainy season begins. Many organic fertilizers contain the spores of beneficial microbes, called mycorrhizal fungi. This symbiotic fungus can aid a plant during drought by helping roots access water and nutrients.

- **Pruning**
Remove dead limbs that may be harboring insect pests or diseases. Light pruning on shrubs to permit circulation may deter insect pests like whitefly that like dry conditions. But in general, avoid significant pruning of live plant material to reduce additional stress and create wounds that attract pests.
- **Anti-Transpirants**
An anti-transpirant is a compound sprayed on foliage to provide a barrier to water loss. These products have a short-term benefit, but can be especially useful on young plants or new plantings.
- **Pest Management**
Keeping plant stress to a minimum through efficient irrigation, mulch, and slow-release fertilizers will help deter pests. Monitor plants frequently to identify and manage any problems as soon as they occur. If pest problems persist, use soaps, oils and biological controls (such as spinosad) to manage problems. Use any pesticides sparingly to reduce the impact on the beneficial insects that can help keep pest problems in check.



For More information:

Our Water Our World, www.ourwaterourworld.org

Drought and Landscape Plants, article by B. Fraedrich, Bartlett Tree Research Labs. www.bartlett.com/resources/Drought-and-Landscape-Plants.pdf

How Does Drought Stress Influence Plant-Insect Interactions? Article by University of Illinois Extension: <http://hyg.ipm.illinois.edu/pastpest/200516f.html>

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