Photo 1: Perhaps the most common symptom of drought on many woody plants is death. Some woody plants do not show wilt symptoms before tipping over the edge into death.

Photo 2: This cherry is showing typical symptoms of drought: lethargic, droopy, and off-color foliage.

Photo 3: One of the most common symptoms of drought on woody plants is scorch, often exhibited as yellow or necrotic plant tissue at the leaf margins and between leaf veins.

Photo 4: Having lost all of its foliage, the top half of this spruce appears dead. The needle loss was probably due to heat and drought. Close examination, however, reveals live cambium and succulent green buds; believe it or not, the tree is on a path to recovery.

The Plant Doctor's LANDSCAPE TIPS

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DROUGHT

INTRODUCTION:

Most scientists agree that Climate Change (a.k.a. Global Warming) is occurring and that it is a human-induced phenomenon. Climatologists are warning of more extremes in weather patterns as Climate Change continues to be manifested.

2012 will undoubtedly be recorded as one of the worst droughts in recent history, affecting many areas in North America besides Michigan. We encounter drought every year in some localized areas around the state, but the most recent period I can recall that exhibited so much widespread drought throughout Michigan and other neighboring states was the summer of 1988.

Complicating the drought was the variable temperature extremes attained during 2012. A very mild winter with temperatures sometimes reaching into the 60s and 70s during January and February can affect plant development and the impact of pest and disease activity. Late frosts and drought contributed immensely to crop reductions and losses in Michigan, especially the fruit and field crop industries. Temperatures in May and June often reached into record high 90s (F), typical of August temperatures. Drought and high temperatures often work in combination to cause adverse effects on our plants.

DROUGHT SYMPTOMS AND COMPLICATIONS:

Plants exhibit various symptoms in response to inadequate moisture. These symptoms may be acute, which are direct effects of low moisture on plants, or complicated with other plant, cultural and environmental issues.

Acute Symptoms: Two of the most common symptoms observed on plants affected by drought are death (Photo 1) and wilting (Photo 2). Other consequences of inadequate moisture, depending on the time of year and growth stage of plants, include poor growth, scorch (Photo 3), foliage loss (Photo 4) and changes in foliar coloration, including early fall color development (Photo 5). Other symptoms may also be noted.

Drought Complications: A variety of pests, diseases, cultural problems and environmental issues (ex. high temperatures) may interact with drought conditions and affect plants in various ways. Insect attacks that compromise moisture uptake and translocation by the plant can exacerbate drought symptoms. For example, Emerald Ash Borer activity on ash trees or collar weevil activity on pines (Photo 6) can sufficiently disrupt the vascular system of plants to cause plants to wilt earlier than healthy plants might. Diseases such as low grade Verticillium wilt infections may inhibit water movement within plants, especially when water is lacking during drought. High salt index fertilizers and irrigation water with high salinity often encourage drought symptoms in plants. Soil conditions such as compaction and texture may help stimulate drought-induced symptoms in plants. These and other complications when combined with inadequate moisture may determine whether a plant exhibits relatively harmless drought symptoms or whether a plant may succumb to drought conditions.

MANAGING DROUGHT:

The most obvious correction for drought is simply to provide supplemental water to plants. While providing supplemental moisture might be satisfactory in many situations, drought management is often far more complicated. Following are some issues that should be considered when ameliorating apparent drought problems.

Diagnosis: It is vitally important to determine whether the affected plant is permanently affected by drought (death) or whether the plant has encountered a temporary setback (Photo 7). It is also important to accurately diagnose drought and differentiate inadequate moisture from other complications (noted above) or other causes. Root rots, insect infestations and other factors may mimic drought symptoms.

Monitoring/Prioritizing: When managing drought it is helpful to monitor moisture and to prioritize plants. For example, established trees and shrubs will generally be far more drought tolerant than new transplants. Hence, supplemental irrigation should be directed toward new plants. It is also important to acknowledge that green lawns are given preferential treatment over other landscape plants and trees; daily lawn irrigation may not be providing adequate moisture for trees and shrubs. In some instances during 2012, overreaction to drought by increasing irrigation resulted in plant drowning (Photo 8). Monitoring soil moisture is very important.

Mulch: Mulching is one of the most important practices in plant health for a variety of reasons. With reference to drought, mulch helps to prevent drought issues and to help new plants become established. Be certain to mulch plants properly; excess mulch can initiate many long-term detrimental effects on plants.

Soil Modifications: Compacted soils and very heavy clay soils may restrict root development and water penetration. Alternatively, very light soils may drain and dry out more quickly than loam soils. Modifying the soil for optimal plant health (including nutrition) can assist root expansion/development and aid in water retention to help plants through periods of drought. Soil amendments that stimulate activity from the soil flora, fauna and microbes should increase a plant's tolerance of drought. Fertilizers with a high salt index will exacerbate drought issues more so than low-salt-index fertilizers.

Planting: Proper plants in proper locations go a long way to minimizing plant stresses that can predispose plants to drought. Where practical and desired, the establishment of drought-tolerant plants may be advised, especially in plant-inhospitable areas or where low maintenance is planned.

For more information, please feel free to email David Roberts at robertsd@msu.edu or contact a professional plant health care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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Photo 5: Trees or portions of trees under drought stress typically develop fall coloration earlier.

Photo 6: This felled white pine is undergoing an autopsy. Collar weevil activity at the base of the trunk undoubtedly exacerbated the rapid wilt during drought (inset). Note gunky soil/resin material (on stump) resulting from weevil activity.

Photo 7: These Bradford pears inhabit a very difficult site in this parking lot island. Without irrigation and subjected to deicing salts every winter, the tree in the right background appears to have lost its foliage and died during the drought of 2012. Close scrutiny reveals live succulent, green cambium and buds (inset); the tree will survive.

Photo 8: The foliage of this Dawn Redwood is scorched. The scorch was caused by too much rather than too little water during the summer of 2012.