UMASS EXTENSION

Hort Notes

An educational newsletter with research-based information for businesses and individuals involved in selling, planning, designing, servicing, and enjoying landscapes and gardens.

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Current Monitoring Checklist:
PLANT PHENOLOGY FOR MAY: BETWEEN 500 - 599 GROWING DEGREE DAYS
http://www.umassgreeninfo.org/fact_sheets/ipmtools/500_599_GDD.html

Dealing with Frost Damaged Plants

We were caught by surprise by the recent cold weather and now see damage on a variety of plants in the landscape. Should we be doing anything to help these plants? Would fertilizing help?

Hardy plants are not as hardy when they are actively growing versus dormant. When new growth is expanding, it may be killed by hard frosts at this time in spring. Mature plants in the landscape will survive and put out another flush of growth but plant seedlings may be killed as they have little or no reserves to draw upon for regrowth. If you have already fertilized this spring, the fertilizer elements are still present and applying more fertilizer will not accelerate growth. Instead, keep plants watered if the soil in dry and wait a bit before pruning out dead or damaged tissue.

Roberta Clark, UMass Extension Educator
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June 2002 Drought Conditions in Massachusetts - a look at the groundwater

Are we out of the drought? With recent rainfall, stream flow in all areas is higher than normal, but drought experts caution us to look at the groundwater to make drought determinations. The United States Geological Survey (USGS) maintains a series of observation wells throughout the country where

depth to groundwater is digitally recorded (60-minute interval), up-linked to satellite and posted on their web site. In Massachusetts, there are eight observation wells; the URL is http://ma.water.usgs.gov/ground_water/ground-water_data.htm.

Information on the site indicates that some areas have higher than normal goundwater levels (those in the 75th quartile have higher groundwater levels than in 75% of previous years), normal levels (50th quartile), and some wells are lower than in the 75% of the previous years (25th quartile). The Q25 (25th quartile) is shown to provide an idea of what is a low level for that particular well. All sites are well above recorded low groundwater levels. It appears that some areas are out of drought conditions, while other areas still have lower groundwater levels than are normal. However, this is a snapshot of the immediate conditions. Reviewing additional information over the next month will provide more confidence in the assessment.

More drought information with links to many data-rich sites can be found at the UMass Drought Information web site at www.umassdroughtinfo.org.

Craig Hollingsworth
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Irrigation for Container Nursery Stock

The two most widely used irrigation systems used in nursery production are overhead and drip (or trickle). Overhead irrigation is designed to cover a large area, and these systems are the least expensive to install. However, this method produces uneven water distribution, which can slow plant growth, encourage disease, and contribute to runoff. Also, a container nursery using overhead irrigation can use from 15,000 to 40,000 gallons of water per acre per day in the summer (1), a reminder that sufficient water is a prerequisite to nursery production.

Large containers are usually watered with a drip or trickle system, which uses 60%-70% less water than overhead systems. Drip irrigation systems cost more to install than overhead systems, but have superior application uniformity and efficiency. They are also less affected by wind and crop canopies, and they produce less runoff. Another advantage is that workers can continue working while the plants are being irrigated. The biggest disadvantage to trickle irrigation, besides the initial cost, is keeping the pipes and emitters clean.

A third, less-used type of irrigation system, is subirrigation, using capillary sandbeds. In this system, water rises into containerized plants through capillary action. Usually, the sandbed is covered with at least one inch of fine sand, and slopes very slightly from one end to the other. Water is released at the high end and slowly percolates to the low end. These systems cost the most to install, but they have no runoff or leaching.

Sandbeds are normally constructed using wood side-walls, a plastic bed liner, sand, a small tank, a drainpipe, and a float valve. They do not require any electrical parts, and provide a uniform and consistent supply of water without forming a saturated water table at the base of the soil column in the

container. In short, you get efficient and uniform crop growth while providing less water, less fertilizer, and less pesticide. It also requires le4ss labor, as sprinkler heads, timers, pumps, valves, and water-treatment systems don't need to be monitored (1).

The biggest disadvantage of sandbeds is that weeds and containerized plants grow into them. There is a product designed to alleviate this problem: the Agroliner™, a mat that has been treated with Spin Out™, a product that prevents root growth. The mat is placed over the sand and under the containers.

Regardless of the system used, it is vital that the plants be watered often, especially on hot, sunny days. A typical nursery plant in a one-gallon container may consume a pint of water a day, while the growing medium capacity may be only 1½ pints. One important aspect of irrigation management is to group plants according to water requirements.

The most important issue in sustainable nursery production, as it relates to irrigation, is the runoff of water, fertilizers, and pesticides. Many states now have regulations limiting runoff and groundwater nitrate levels. Subirrigation systems are designed for zero runoff, but overhead and drip systems may require special attention. Runoff water can be collected using ditches (planted with grass to slow down water flow) or tile systems, which direct water to a pond or other holding area.

The water (and some fertilizers present) can then be recycled by pumping it back out of the holding tank or pond, after some of the impurities (sand and silt) have4 settled out. Recycled water has actually been shown to improve plant growth. "In experiments with more than one hundred species of ornamentals grown in 2.8 liter containers, the mean relative growth of plants irrigated with continuously recycled water was over 103% over that of the control" (2).

Another way to reduce runoff is to use pulse irrigation. In this system, instead of applying one heavy watering daily, a small amount of water is applied five or six times during the day. Very little water escapes from the container or runs off from the field. The production advantage to this is that less fertilizer has to be applied, because there is less leaching. Most nurseries that use this system use a computer to control water flow, since watering plants repeatedly by hand would cause a huge increase in labor expenses.

There are several cultural practices that can reduce runoff:

- Avoid irrigating bare soil.
- Have rough soil surfaces to provide surface storage of water.
- Use less-porous media that retain moisture and nutrients.
- Use slow-release fertilizers instead of liquid fertilizers.

Researchers at Ohio State University have been conducting experiments to reduce the amount of pesticides and growth regulators leached from nursery pots and trays. They have had excellent success in mixing chemicals in ordinary latex paint and then painting the interior of the pots. Not only was there less leaching from the pots, but the growth regulator and pesticide they used (Bonzi™ and Marathon™) provided more consistent control. This method also reduced worker re-entry intervals into the nursery area, since the chemicals were applied only once, at the beginning of the growth process (3).

This article is from Sustainable Small-scale Nursery Production, *May 2000 (Revised Nov. 2001) by Steve Diver and Lane Greer, National Center for Appropriate Technology, University of Arkansas, Fayetteville.*

Submitted by Ron Kujawski, UMass Extension

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