



# News & Views

*for New Hampshire's Green Industry*

April - June, 2002

## Efficient Water Use in the Landscape

Whether or not the current drought conditions last, we need to manage our water resources wisely both to conserve water and to enhance plant survival and health. Here are some guidelines for managing water efficiently in the landscape.

### New Plantings

**Water Wisely.** Do not plant during a drought period unless you have the capacity to water regularly for the rest of the growing season. Water thoroughly after planting, then water once or twice a week, applying enough water to wet the soil to a depth of 8-12" for trees/shrubs or 6" for annuals. Applying ten gallons of water each time should be sufficient for a 20-24" root ball. One gallon of water per square foot of soil surface area in the root zone is a general guide to provide sufficient water for trees/shrubs once roots have grown out of the original root ball.

Plants grown in lightweight container mixes will dry out more quickly after transplanting and therefore require more frequent irrigation than balled and burlapped material.

**Plant selection.** Group plants by water needs in the landscape design, providing irrigation for those with high water requirements. Choose drought-tolerant plants for unirrigated areas, but make sure they are suitable for the site characteristics and adaptable to varied soil moisture levels. If irrigation is limited, install smaller plants, which naturally have lower water requirements and a greater chance of survival.

roots and recover from transplanting faster than larger plants.

**Use soil amendments properly.** Organic matter such as compost should be added to the entire planting area and tilled in. Amending individual planting holes is not as beneficial as amending the entire bed and may actually impede lateral water movement between the root ball and surrounding soil.

**Mulch** can reduce evaporation from the soil surface by 70%. Mulch the root zone of trees and shrubs with 2-4" of organic mulch such as shredded bark. Extend the mulch ring at least to the drip line on individual trees/shrubs. Annuals can be mulched with finer textured mulch to a depth of 1-2". Always keep mulch away from trunks and stems.

**Create water basins** around plants by raising a ring of soil at the outer edge of the rootball. This will help retain irrigation or rainfall for slow infiltration into the soil where fine feeder roots are developing. Break the dams in the fall to prevent saturated conditions and/or ice buildup around the plant.

**Use micro irrigation.** Drip emitters operate at low pressure (6-30 psi) and have application rates ranging from .5 to 2.0 gallons per hour. Micro-sprinklers or microsprayers are low-volume irrigation emitters either installed in-line or connected via tubing to a flexible pipe. Application rates range from 5-35 gallons per hour. Micro irrigation systems are generally operated every 2-3 days without rainfall. Run the system only for the amount of time needed to

rewet the root zone. All the water applied goes into the root zone, with no loss to evaporation or wind drift.

**Use other irrigation aids.** If you are not able to use drip irrigation or microsprayers, consider using one of the new tree rings or tree bags on newly planted trees. These devices are placed over the root ball and filled with water once a week or as needed. The perforated ring or bag then allows the water to drip slowly over an extended period of time, keeping the root zone moist.

**Antitranspirants have limited use.** The most common type of antitranspirants are films which coat the leaf blocking the stomata and therefore reducing transpiration. They may be helpful in transplanting plants in full leaf, but will only provide protection for a few days to two weeks.

**Water-holding gels** (hydrophilic gels or copolymers) incorporated into container media can reduce plant water stress and extend the period between irrigation. However, there is little research to show benefits from application to plants going into the landscape, whether applied as a root dip, a backfill amendment, or by watering in.

**Trial other products, such as mycorrhizae and biostimulants.** Controlled research has failed to result in consistent, repeatable results from use of these types of products at transplanting time, but a drought year would be the ideal time to trial these products which are credited with stimulating root development and enhancing water and nutrient absorption.

### **Established Plantings**

**Prioritize water use.** After new plantings, concentrate next on watering those plants which are most valuable and visible. Consider adding micro irrigation systems to those important areas. If allowing your lawn to go dormant during a drought, provide water for established trees which normally depend on turf irrigation. Water tree root zones deeply every 2 weeks.

**Control weeds and replenish mulch.** Weeds use valuable soil moisture. Remove weeds by hand or use an approved herbicide, then renew mulch to the recommended 2-4" depth. Consider

enlarging mulched areas, particularly around trees.

**Hold the fertilizer.** Nitrogen fertilization increases the shoot to root ratio of woody plants, meaning that more top growth results with fewer roots to support the water needs. In addition, fertilizer salts can cause root dehydration and result in leaf scorch if soil moisture is lacking. Wait until fall, or until normal rainfall patterns resume, to fertilize unless irrigation is provided. If you do fertilize, use an organic or synthetic slow-release fertilizer.

**Delay pruning.** Pruning during late spring or summer stimulates new growth. Prune deciduous plants during the dormant season instead, removing only dead and dying plant parts during the summer. Pruning to reduce leaf area is not a recommended strategy for coping with drought.

**Water wisely.** Water late at night or early in the morning when evaporation losses are minimal if using sprinklers or hoses. Install a rain-shutoff device on automatic irrigation systems so that you don't waste water by irrigating when it does rain. Water when plants show signs of stress - usually wilting or a color change. Annuals may require water every 2-3 days, whereas established woody plants and perennials can usually go a week or even two. Water adequately when you do water, so that the entire root zone returns to field capacity.

*This article was adapted from a new fact sheet "Efficient Water Use in Nurseries and Landscapes." The complete version will be available on the web at <http://ceinfo.unh.edu> under Agricultural Resources - Plants - Ornamentals. A list of drought-tolerant plants for New Hampshire is also available on the site.*

**Cathy Neal**

## **The Effect of Drought on Some Insect Pests**

Drought can have a profound effect on both insects and plants. The lack of moisture not only affects the insect but also the way the plant responds to the insect feeding damage. Here are a few examples.

**European Chafer:** The European chafer is destroying millions of dollars of lawns and

pastures in southern New Hampshire. The grub feeds on grass roots from July to October. If numerous, the grubs kill the grass or severely weaken it going into the winter. EC females prefer to lay their eggs in drier soils. Wet soils drown the eggs and 1<sup>st</sup> stage larva. Pathogens which attack the grubs, require adequate soil moisture. Grub survival is better during drought and populations will increase. Also, drought reduces the ability of grass to respond to feeding damage, and grass mortality is higher.

**Chinch Bug:** Chinch bug is a sucking insect which feeds on lawns. Its preferred hosts are Kentucky bluegrass, ryegrass, and fescues. Chinch bug is a more severe problem during drought. Rain will drown the tiny 1<sup>st</sup> stage nymph. This nymph is smaller than this period (.) and cannot escape if there is too much rain. Also, moisture encourages the growth of fungi which attack and kill the nymphs. If there is adequate moisture, healthy grass can sometimes outgrow the feeding damage and the lawn will remain green. Without moisture, the grass will turn brown and may die.

**Bronze Birch Borer:** The BBB adult emerges in June and seeks out stressed birch trees in which to lay its eggs. Stressed trees have weaker defenses to fight off the attack of the borer. The drought will increase the number of trees that are susceptible to attack and improve the survivability of the larva. Once BBB infests a tree, there is little hope to save the tree. In general, this is true of most borers.

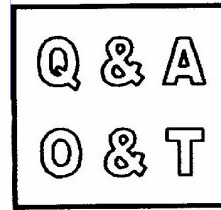
**Gypsy Moth:** The gypsy moth has not been a problem in New Hampshire since the outbreak of 1991. An introduced fungus, *Entomophaga maimaiga*, has helped keep the population in check by killing the larva. However, this fungus requires moisture to grow and spread throughout the population. With reduced activity of the fungus, gypsy moth populations have started to rise the last two years.

**Spider Mites:** Spider mites are probably the best known example of how hot, dry weather causes some pest populations to explode. Spider mites have multiple generations and can quickly build under the right weather conditions.

As we approach summer, make a note of those plants and pests that need to be monitored

more closely this year. Planning now will help prevent significant losses.

**Stanley R. Swier**



## Answers to Your Questions

**Q: What can be done to prepare turfgrasses in case of water restrictions this summer?**

**A: Answer:** 'Mother Nature' will ultimately decide the fate of turfgrass survival if drought conditions occur. However, here are a few tips to help turfgrasses get ready:

- 1. Promote deep rooting.** For example, this can be accomplished by applying a starter-type fertilizer this spring, avoid irrigating until the turf shows signs of moisture stress, liming if soil pH values are very acidic (pH values below 5.0 severely restrict rooting), aerifying compacted soils and increasing the mowing height.
- 2. Water less frequently, and for deeper penetration.** Turfgrasses need roughly 1 inch of water per week to stay green during moisture stress periods.
- 3. Spot water the hot spots.** Southern exposed knolls, sandy soils, and turf growing next to buildings and sidewalks tend to dry out first.
- 4. Maintain high potassium levels.** Potassium is the nutrient needed second most by turfgrasses (nitrogen is number one), and is recognized for protecting the turf from environmental stress (drought and winter survival). Maintaining nearly equal proportions of potassium to nitrogen when fertilizing is suggested.
- 5. Mow less frequently and higher.** Higher mowing heights promote deeper rooting. Turf growth will slow down and virtually stop (summer dormancy) when moisture stress conditions exist. Leave the mower in the shed at this point.
- 6. Accept a brown lawn.** Once dormancy has set in, the turf will turn brown. Green-up will occur (unless the turf is dead) following cooler weather and rainfall resumes (usually by mid-September).

**John Roberts**

## Drought Stress and Woody Landscape Plants

By August 2001, symptoms of drought stress were evident on many trees and shrubs throughout most of New England. The most common symptoms were marginal leaf scorch and browning of needle tips. Scorch symptoms were most common on maples, Bradford pears and dogwoods. The symptoms were usually most severe in the upper branches (as opposed to symptoms caused by anthracnose and needlecast which are more common in the lower branches). Early fall coloration and leaf drop are also common drought symptoms. In reality, we are also looking at the effects of accumulated drought stress. In nearly every year since the severe drought of '95, we have experienced below normal precipitation during the growing season. Many spruce trees have dropped significant numbers of needles on the outer and upper branches, hemlocks exhibited widespread needle yellowing and severely affected white pines have lost all but the youngest needles. Similar leaf drop patterns have been noted on broad-leaved evergreens. Accumulated drought stress often results in crown dieback. Trees growing near rivers and lakes are usually shallow-rooted due to high water tables, and ironically, are often the first to exhibit symptoms during a severe drought. Green stems on rhododendrons are showing shrinkage, or vertical wrinkling. These obvious, visible symptoms are just part of the picture.

More importantly however, a significant secondary effect of drought is that it weakens plants and predisposes them to fungi that cause cankers and twig blights, attack by insect pests such as bark beetles and borers, and increased susceptibility to winter injury (luckily, this past winter was mild!). Fungi in the genera *Nectria*,

opportunistic, canker-causing fungi that commonly invade wounded or weakened tissues. Water stress slows the wound healing process thus making it easier for these fungi to gain a 'foot hold' in the wounded tissues. Northern red oaks exhibiting branch dieback caused by *Botryosphaeria* (the dead leaves remain attached to the dead twigs throughout the winter, making them easy to identify for removal). *Phomopsis* and *Kabatina* tip blights will likely be very common on junipers this year. *Phomopsis* is also causing dieback on many deciduous shrubs. Dead or blighted shoots should be removed during dry weather after the new growth begins in the spring (so you can be sure which shoots and branches are actually dead).

If we receive 'normal' rainfall this growing season, will the symptoms go away? The immediate, short-term symptom such as leaf scorch or early leaf fall should diminish. But, as described by Sinclair in **Diseases of Trees and Shrubs** (Cornell Press), the effects of severe drought are usually evident for years since it usually takes older, unirrigated trees several years to recover. Restricted root space and roots growing in compacted soil are probably two of the most important contributing factors to moisture stress. These plants can usually survive under normal moisture conditions, but their roots are usually the first to be affected by drought.

Because drought stressed trees are more sensitive to pesticide, their use should be avoided unless there is a serious insect problem. Unless we have prolonged wet weather, it is unlikely there will be much disease pressure from foliar pathogens. With close attention and a little extra care, many trees and shrubs should be able to survive this extended (and compounded) period of drought stress.

**Cheryl Smith**

This newsletter is a cooperative effort of the Ornamentals Extension Educators and Specialists at the University of New Hampshire. It is published quarterly. Its purpose is to inform and update industry members on issues and research relevant to the production, use and maintenance of ornamentals and turf in New Hampshire. Contributors for this issue:

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**Nursery & Greenhouse  
Plant Growers Twilight  
Demonstration &  
Discussion Meeting**

**Tuesday, June 4, 2002  
5:00 p.m.**

**Studley's Garden Center  
82 Wakefield Street  
Rochester, NH**

**Topics:**

- *Greenhouse bedding plant production tips; fertilization and nutrition, identification and management techniques of nutrition related problems of greenhouse crops.*
- *Identification and management strategies of major insect pests and diseases of greenhouse and nursery crops.*
- *Container media and nutrition of nursery crops in production and retail operations.*

**UNH CE Specialists attending:**

Dr. Paul Fisher, Floriculture  
Dr. Cathy Neal, Orn. Horticulture  
Dr. Cheryl Smith, Plant Health  
Dr. Stanley Swier, Orn. Pests  
Dr. Alan Eaton, Entomology-IPM

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For more information contact Geoffrey Njue, Extension Educator Agricultural Resources at (603) 749-4445.

**Turf & Grounds Maintenance  
Field Day**

**July 9, 2002  
8:30 a.m. to 2:00 p.m.**

co-sponsored by

City of Nashua  
Parks & Recreation Department  
and  
UNH Cooperative Extension

***No charge!***

Visit some of Nashua's outstanding parks and recreational facilities. Nearly 20 projects are in various stages of development, including reconstruction of Holman Stadium, new playing fields at Artillery Field, and landscape renovations and enhancements throughout the City's parks.

- Learning stations with topics ranging from tree maintenance and pruning to turf insect and weed control
- Guided tour of renovations and new construction in city parks and athletic facilities
- Equipment demonstrations and vendors on-site
- Pesticide recertification credit
- Free LUNCH at Holman Stadium

*Save the date!  
More details in late May.*

**UNH Cooperative Extension's**



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