

WINTER INJURY and PROTECTION OF ORNAMENTALS

Barbara J. Bromley, Mercer County Horticulturist 2011

(This is a handout to accompany a power point lecture.) Most of New Jersey is USDA Zone 6 with a minimum winter temperature of -5°F. (Some charts have updated NJ to zone 7.) This means that healthy plants hardy to zone 6, 5, 4 or north will survive a normal New Jersey winter. Even these hardy plants can suffer if we have a severe winter or if drought, insects or disease, nutrient deficiency or other cause has stressed them. Winter weather can cause damage to plants in many ways, including desiccation (drying out) and breakage. Snow cover protects plant parts that are below the snow, but reflects strong sunlight onto the parts above the snow level that increases potential damage.

Both coniferous and broad-leaved evergreens are more at risk than deciduous plants that lose their leaves in winter. Broad-leaved plants such as holly, rhododendron, azalea, leucothoe, cherry laurel, boxwood, and mountain laurel have much more leaf area through which to transpire than conifers or "needle" evergreens. Transpiration, the loss of water through the leaf pores or stomates, occurs all winter in evergreens. Transpiration levels can be high on sunny winter days and during periods of strong winds. Serious scorching or drying of leaf tissue may occur because plants can't replace water lost from the leaves when the soil water is frozen and, therefore, unavailable.

Winter damage may be immediately apparent on plants even before the end of winter. Other injuries do not show up until after new growth has resumed in spring. Some flowering trees bloom gloriously, only to die for no apparent reason after the leaves emerge. Some forms of winter damage may not be evident until June or later when plants are under heat or drought stress and water does not flow well through winter-damaged tissue.

CAUSES OF WINTER INJURY

- ◆ Excessive winds dry evergreen foliage, especially when the ground is frozen. Strong winds from the northeast, called nor'easters or winter hurricanes, may desiccate plants that are normally in a protected location.
- ◆ Bright sun or high mid-winter temperatures when the ground is frozen put some plants at risk. The longer and deeper the freeze, the greater the potential for injury. Reflected sunlight off snow can hasten sunscald and desiccation. Sunlight through ice can scald leaves and branches and underlying tissue.
- ◆ Alternate freezing and thawing of the ground in late winter heaves small plants and roots out of the ground, exposing root systems to desiccation.
- ◆ Late frosts that occur after plants have come out of dormancy may kill tender young foliage or damage buds, especially flower buds.
- ◆ Heavy snow and ice cause bending and breakage of flexible and multi-stemmed plants and may cause snapping of roots. Ice can also damage trunks and stems at the ground level where it rubs against the bark.
- ◆ De-icing salts that splash on plants or drain with melt water into the root zone can burn foliage and/or root systems.
- ◆ Feeding by voles, rabbits, deer and other varmints can injure various plant parts. Roots, trunks, and stems may be completely girdled or stripped of bark by the feeding of voles. These mouse-sized animals can tunnel under snow or mulch and may also feed on lawn grasses. Other animals feed on leaves, buds, evergreen foliage, and stems.
- ◆ Elevated plantings. Plants in containers that sit above ground level, especially in containers that have an air space under them, are especially prone to winter desiccation. The plants should be hardy to USDA zones 4, 3, or 2 to tolerate container planting in New Jersey.

MATERIALS ESPECIALLY SUSCEPTIBLE TO INJURY

- ◆ Ornamentals with late growth that was stimulated by pruning or fertilizing of plants between mid-July and mid-October. This tender young tissue does not harden off sufficiently before winter.
- ◆ Plants and plant parts that receive afternoon sun in winter (a south, west or southwest exposure.) Afternoon sun warms leaf and stem tissue that is subsequently damaged or killed when temperatures drop drastically as soon as the sun sets. This can result in frost cracking and sunscald on tree trunks and large limbs and foliar browning on evergreens.
- ◆ Recently planted materials (in the ground less than 1 to 2 years), that are not fully recovered from transplanting and have lost many of their water-absorbing roots in the transplant process.
- ◆ Materials known to have a poor recovery rate from fall transplanting, such as evergreen hollies, pears, stone fruit trees (cherry, peach, plum), and oaks.
- ◆ Plants that are only marginally hardy in this area, such as Southern magnolia, crape myrtle, aucuba, skimmia, Gumpo azalea, mimosa, and willow oak.
- ◆ Plants lacking winter hardiness because of disease, drought, nutrient (especially potassium) deficiency, or other cause.
- ◆ Plants near sidewalks, roads, and highways where de-icing salts are used.
- ◆ Plants in on-the-ground or above-the-ground containers.

TYPES AND SYMPTOMS OF WINTER INJURY

- ◆ Root injury from sub-freezing soil temperatures and/or lack of available soil moisture.
- ◆ Death of top branches or branch tips (dieback), or of entire plants.
- ◆ Death or damage to leaf or flower buds by desiccation.
- ◆ Bud or blossom injury from late frosts or freezes.
- ◆ Scorching or drying of evergreen leaves and needles, which turn partly or totally brown or tan.
- ◆ Trunk injury from sunscald and frost cracking. Bark may split near the base of the trunk or in long (up to 4 feet or so) cracks up the trunk, especially on trunks where there has been physical injury. This physical injury may be “bruising” that is not noticeable on inspection or may be damage from string trimmers or lawn mowers that is easily seen. Cracking often occurs on the west or southwest side of the trunk when afternoon sun increases the temperature of the bark. When the sun sets, bark temperature drops rapidly. Injury may also be caused by the abrasion of sheet ice on the base of the trunk.
- ◆ Death of tissue (sapwood or xylem, phloem, cambium) in or under the bark. "Black heart," sapwood that turns dark in color as a result of freeze-damage, may occur. Plants fail to leaf out in spring or may die after leaf buds open and translocation starts.
- ◆ Stem breakage from heavy snow or ice.

CARING FOR WINTER-INJURED PLANTS

- ◆ Prune out dead and damaged wood. Cut back broadleaf evergreens before the onset of new growth if foliage has dried out.
- ◆ Carefully trim away loose bark at any crack until remaining bark is firmly attached to the tree. This trimming helps improve wound wood formation or callusing. Callus is cell tissue that forms to cover wounds.
- ◆ Remove and replace plants that are no longer desirable landscape specimens or that are dead. If the plant was incorrectly sited at that location in the first place, do not repeat the error.

Select a different plant that will tolerate existing environmental conditions.

- ◆ Reduce stress on injured plants by fertilizing, watering during dry periods, controlling weeds and insects, mulching, and generally increasing plant vigor.
- ◆ Reposition and stake plants blown over in winter storms if root damage is not too severe. The larger the plants, the less likely they are to survive such efforts. Treat as transplants for at least two years, paying close attention to proper fertilization, pest control, and watering.

PREVENTING FUTURE DAMAGE FROM WINTER INJURY

- ◆ Review plant selection, planting, and maintenance practices.
- ◆ For each landscape location and exposure, choose plants that will tolerate the site. Check plant hardiness zone limits. Near roadways, select plant materials known to be salt tolerant. For planter boxes or other raised containers select plants hardy at least two hardiness zones north (USDA zone 4) of our zone 6 (7).
- ◆ Use correct planting procedures to help hasten transplant recovery.
- ◆ Avoid fertilizing or pruning woody plants from mid-July to mid-October.
- ◆ Maintain good plant nutrition by having a soil test run to determine available nutrients and soil pH. Pay particular attention to soil potassium level (important for winter hardiness).
- ◆ Use antidesiccant sprays or burlap or other screens to reduce moisture loss. Protect evergreens planted within the last two years. Water in fall and during mid-winter thaws, if needed.
- ◆ Do not pile organic mulches that provide cover for bark and stem eating voles on the base of trees and shrubs. Leave a 2 to 6 inch gap between the mulch and the trunk or stems.
- ◆ Support plants prone to splitting (arborvitae, juniper, yew, boxwood, and flexible multi-trunk trees such as birch) from snow or ice weight with soft rope or string straps or ties.
- ◆ Use appropriate winter protection materials, if necessary.
 - Structures, such as greenhouses, cold frames, and A-frame snow shields.
 - Stake and burlap screens, snow fencing, or other wind, sun, and salt-spray blocks.
 - Winter mulches to protect from frost heaving, premature emergence during mid-winter thaws, and fluctuations in soil temperature. (These are applied after the ground freezes.)
 - Tree wrap to protect newly planted trees from sunscald, frost crack and animal damage.
 - Straw and burlap "mummies" to protect edible fig and other non-hardy plants.
 - Antidesiccant/antitranspirant sprays such as Wilt Pruf or Folicote to help reduce water loss through leaves and stems. Follow label directions.
- ◆ Instead of de-icing salts (sodium chloride and calcium chloride) use fertilizer to melt ice.
- ◆ Use abrasives for traction, such as kitty litter, cinders, sawdust or sand instead of salt. If salt does get onto a plant, hose it off with fresh water and apply agricultural gypsum (20-50 lbs. per 1000 sq. ft.) to the soil at the first thaw or in early spring.

Check reference books to determine plant hardiness and whether protection is needed for a particular plant and which mode of protections is most effective.

Additional resources: Rutgers Extension Fact Sheets FS 663, *The Impact of De-icing Salt on Roadside Vegetation* by Ann Gould and Karen Kackley-Dutt and FS 122, *Tree Problems Caused by People in the Suburban Landscape* by Ann Gould and Mark Vodak.