

Protecting Landscape Plants

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Plants often represent a significant investment in the landscape, of money, time, effort, or a combination of all three. It is important for homeowners and landscape managers to understand how protecting landscape plants during growing practices at the nursery, while transporting and storing after purchase, during construction or site changes, and after establishing them in their landscape influence successful growth and development. Plants should be protected during all stages of their lives.

Growing

Protection begins with proper handling by the growers, nurseries, or retail suppliers. Careless practices when plants are transplanted into different containers or moved in a nursery row can result in stunted growth, development of circling or girdling roots, secondary cankers, or wounds to the crown or structure that may cause failure later in the plant's life (*Figure 1*). National standards, including those developed by the American National Standards Institute (ANSI) exist to ensure that plants being sold to consumers meet specifications that will give them the best chance of arriving on a property in good condition. Refer to American Standard for Nursery Stock (americanhort.org/documents/nursery_stock_standards_AmericanHort_2004.pdf). In addition, plants



Figure 1. If circling roots in containers are not resolved before planting, they can result in poor root structure in mature trees. As trees and roots grow, circling roots can girdle the tree, making it susceptible to dieback and death.

should not be placed directly on pavement at any time during production or display at retail locations.

Transport and Storage or Staging

Plants may be transported several times before they are installed in their permanent location. Whether being moved from the production

greenhouse to a nursery field, or from the field to the retail site into the landscape, plants need to be protected from damage. Carefully managing temporary or longer-term storage and staging at the nursery or at home prior to planting can help avoid exposing plants to temperature extremes, desiccating winds, reflected heat or lack of moisture — all of which can weaken plants and lead to failure after they are installed.

- **Transport.** Protection of plants during transport is essential (*Figure 2*). Whenever moving the plants, they should be lifted and moved by the root ball, not by the trunk or stem, which may cause the roots to loosen from their surrounding soil, the ball to crack, or the trunk to inadvertently twist, weakening it. Plants should be secured and covered during transport. Driving even a few miles at a low speed can shred tender foliage, bounce or slide trunks against tailgates, and slap branches against the sides of one another. This damage may appear to be minor, but can result in reduced establishment and vigor, cankers, cracking, and entry by secondary pests. Inspect the root ball for hitchhikers; voles or insects can use the roots to invade a landscape.
- **Storage or staging.** Plants are often purchased with good intentions for immediate planting, but poor execution due to time conflicts, weather issues, or an unprepared site can result in plants being held aboveground for one or more days. Plants awaiting installation should be protected from damaging winds, which can tip them over or desiccate their foliage or roots; direct hot sun, which can heat the root ball and cause root dieback, especially if plants are in dark plastic containers; and invasion by wildlife which may cause trunk damage or “pruning” cuts to stems. Place plants in a partly shaded location protected from wind and keep the root balls moist (*Figure 3*). Bare root plants and balled and burlapped plants that have been in a nursery long enough to produce roots outside the ball need to be kept moist and loosely covered at all times to avoid losing those essential roots.



Figure 2. Wrapping the trunk or using a tree guard is a simple way to protect from damage during transportation and after planting; likewise, loosely tying the stems or canes of shrubs and then securing the entire plant from rolling will help avoid stem damage.



Figure 3. If plants will be held for several weeks or a season, they should be protected by placing the root mass (in the container or ball) in mulch, or heeling them in to a holding bed. Nurseries that use a “pot in pot” system to hold plants, such as the one pictured above, are providing a good holding environment.

Construction or Landscape Changes



Figure 4. Existing trees also can be damaged by digging into their root systems to install new plants, or to modify utilities or irrigation systems. This damage can be minimized by designing the landscape to place plants at the outer edges of tree canopies, installing smaller plants, and hand-digging holes and trenches.

Landscapes often change with ownership, or as a family grows and uses the outdoor environment for different purposes. Functional or practical reasons for changes to a landscape may include constructing an addition to a home, enlarging a driveway or adding a patio, or correcting site problems such as poor drainage or a steep slope. As landscapes mature, the plants that create canopy and enclosure may become overgrown or unhealthy, or they may lose their aesthetic character. Other plants may develop majestic size and unique appearance, but their companion plants may deteriorate.

Working in an existing or established landscape requires special protective measures to minimize damage that may not be apparent for years after the project is finished (*Figures 4 and 5*). Protection begins by identifying and marking the construction zone, and limiting access to other areas. Corridors that will be used by contractors and equipment also should be clearly identified. This step will help reduce negative impacts on the soil, which is essential for good plant growth. If practical, use temporary coverings such as plywood to spread the load and avoid the creation of ruts. Working in these “restoration” landscapes also necessitates identifying plants to remain during the construction process and developing a method by which they can be protected from damage, and a well-thought-out post-construction management plan.

All too often, an existing tree is “saved” during construction, only to slowly die over a period of several years. A contractor or owner may think all necessary protection steps have been taken by shielding the root zone, not allowing chemical spills or materials to seep into the soil, and keeping equipment away from the plants. However, a frequent oversight



Figure 5. The simplest way to protect the root zone from equipment damage and inadvertent changes in grade during construction is to install substantial fencing — and enforce this barrier with diligent observation.

is failure to take into account changes in the surrounding grade that affect drainage — more slope, or no slope, a change in the actual drainage pattern, and the addition of structures that block the sun or modify wind patterns — all of which can impact existing plants.

- **Soil modifications.** The root zone of a plant is essential to its health and long-term survival. Protect this zone around existing plants by avoiding cut or fill. If working with a contractor, installing a highly visible fence will establish the line beyond which no disturbance of the root zone should occur. While the ability of many species to adapt to the loss of root mass through cuts, or the loss of air capacity through fill, is amazing, very few plants are resilient enough to pull through without stress. Some species, such as spruce and fir, will not tolerate cut or fill.
- **Soil compaction.** The root zone also should be protected from compaction and mechanical or construction equipment impacts. Contractors want to park in the shade, off the street, or out of traffic patterns, which usually means on the soil, over the roots of existing plants. The result of reduced pore space in the soil after vehicular traffic can be seen immediately on groundcovers and turf, but it may not be apparent for a season or more on woody plants. In addition, plants and soil may be subjected to engine heat and discharge or leaking oil or gas as vehicles drive over landscape spaces or park near them.
- **Foreign substances.** Paint, solvents, cement, acids, fertilizers, and oil are a few of the substances that get washed out of containers or equipment into the soils that will support healthy plant growth (Figure 6). These types of pollutants can cause immediate damage, or seep slowly into the



Figure 6. The best protection from damage by foreign substances is to keep spills from happening. Removal of contaminated soil may be the only option if remediation is necessary.



Figure 7. Multiple wounds from weed eaters and mowers hitting the tree trunk have caused major damage to this tree. The addition of a mulch ring would have helped protect the tree.

surrounding landscape and appear later, at a distance. In addition to being harmful, the practice of casually dumping unused materials may be illegal.

Protection After Installation

Newly installed landscape plants may need to be protected from mechanical damage, animal injury, or

winter conditions. One of the best and simplest ways to protect plants and soils in the landscape is to apply mulch and temporary wraps or fencing. For more information on mulches see EC1274, *Mulching the Landscape*.

- **Mechanical damage and animal injury.** The trunks of young trees can be easily damaged by equipment or animals (*Figure 7*). Mowers, weed whips, and

carelessly wielded rakes and shovels can cause enough injury to kill a tree or shrub, especially if it occurs over and over again in the same location on the plant. Voles, gophers, rabbits, and squirrels all will take advantage of the nutrients available under thin bark, and can girdle trees of substantial diameter overnight. Tree squirrels generally damage upper limbs of trees, rather than inflicting significant trunk damage.

- **Winter conditions.** Plants in exposed locations may suffer winter injury, including desiccation or dieback. Consider protecting plants that are on the edge of their hardiness zone, plants with delicate or thin foliage, and grafted plants. Broadleaf evergreens, such as vinca, holly, and roses, especially those grafted on standard, are examples of plants that may benefit from winter protection (*Figure 8*). Methods of protection involve creating a screen to deflect wind and provide shade, and mulch to moderate swings in soil temperature.

Some marginally adapted plants require the placement of mulch as a cover over the entire plant before winter to protect them from severe temperature fluctuations that occur in Nebraska. These entire-plant mulches need to be removed in the spring when temperatures warm up to allow new growth (*Figure 9*). The mulch should not be removed too early because damage can occur if an unexpected freeze happens. Mulch that is not removed once temperatures increase will keep the soil cool and delay growth and may result in disease or insect pest infestations.

- **Temperature fluctuations.** Young trees that have not developed their mature bark and thin-barked trees, such as maples, are susceptible to frost cracking and sunscald. These injuries occur in



Figure 8. The winter desiccation of this groundcover vinca might have been avoided with a temporary mulch.



Figure 9. Constructing a wire cage and filling it loosely with leaves provides a layer of insulation for plants highly susceptible to winter injury. Make sure the insulating material is loose enough to allow water and air movement. This type of protection also can attract animals, so inspect the protected plants frequently.



Figure 10. Sunscald damage is most often found on the southwest side of the tree. Trees can survive with small cracks; however, severe or repeated cracks can necessitate removal of the tree.

winter when sunny warm days are followed by a significant drop in temperature. The sap, which rises when the trunk warms, freezes and cells rupture (*Figure 10*). This damage can be prevented by choosing and placing susceptible trees in locations less likely to experience these temperature

changes, or by protecting the trunks with tree wrap or tree guards.

Several types of temporary tree wrap and guards are available. Kraft paper can be wrapped tightly around the trunk to just below the first branches, and secured with paper tape. Spiral

plastic wraps are available with perforations that allow air movement; these can be unwound as the tree grows and reused. PVC pipe or plastic drain pipe can be split and placed around the trunk. Black or dark-colored materials should not be used, since these can cause a significant heat buildup. Chicken wire or hardware cloth can be used to protect trees from animal damage. The key to using tree wraps and guards effectively is to leave them on only long enough to protect the plants from damage, but not long enough to provide a habitat for insects or expansion of the trunk diameter beyond the flexibility of the wrap. Remove the wrap periodically to inspect for insect damage. If necessary, replace the wrap in the fall, or at the first sign of animal activity in the area. Significant animal activity may require fencing, either around individual plants or as a perimeter exclusion barrier. For more information on protecting the landscape from wildlife, see the Internet Center for Wildlife Damage Management (*icwdm.org*).

Conclusion

Taking the necessary steps to protect landscape plants and the soils that support them is a good investment. Purchasing plants that have been handled properly during production, transport and storage; protecting the environment into which they will be placed; and providing necessary protection after installation will give plants the best chance of thriving.

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