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The Green Scene

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FIREBLIGHT OF TREES AND SHRUBS IN THE LANDSCAPE AND GARDEN

The rains we've had are most welcome, but rain also makes conditions favorable for fireblight, a destructive affecting some species and varieties of plants. The disease takes its name from the blackened appearance of twigs and branches, which appear as though scorched by fire. The incidence of fireblight is strongly affected by rainfall, and although a problem in Kern County, the disease is more frequent and more severe in higher rainfall areas. If a tree or shrub contracts the disease, careful pruning may be needed to prevent death of sections of the canopy or even the whole plant. Only plants in the rose family can be affected, so problems in unrelated trees and shrubs, for example, elm, willow, pittosporum, etc., cannot be the result of fireblight.

Although most plant diseases are caused by fungi, fireblight is caused by *Erwinia amylovora* bacteria. Infection occurs during wet spring weather when splashing rain, wind, bees, and other insects contribute to spread the bacteria from old bark infections to blossoms and new leaves. As bacteria multiply, plant shoots suddenly wilt, with leaves showing patches of brown and twigs turning black. Shoot tips bend over into a hook shape as wilt progresses down a twig. As bacteria move further down the stem to larger wood, attached branches may wilt as water-conducting tissues are killed. Cankers, which are sunken areas of dead tissue, form on branches. During warm (70-85°F) wet weather bacteria mixed with sap ooze to the surface of these cankers and can spread to uninfected parts of the plant or nearby susceptible plants. Overhead irrigation will prolong the active period. As weather turns warmer and drier, bacterial activity ceases, but bacteria residing in wood are not killed and remain quiet until the following spring.

Susceptible plants can be killed in one season by fireblight. Edible pears and quince are extremely susceptible, while apples, crabapples, and are less so, with some varieties showing more susceptibility than others. Ornamental pear species and varieties vary in susceptibility, with most exhibiting low incidence of fireblight in Kern County. 'Aristocrat' ornamental pear is very susceptible and cannot be grown further north in the San Joaquin Valley, but does well in Bakersfield. Occasionally, pyracantha, hawthorn, photinia, cotoneaster, or loquat may be affected, but damage is usually slight. Non rose-family members, such as camphor, redwood, ash, and oaks, cannot contract firelight.

If the disease is progressing in a tree or shrub, pruning several inches below the infected wood can arrest further damage. During dry weather dead areas should be cut out of the tree several inches below the diseased twigs or cankers. On heavier wood in very susceptible trees, like pears, pruning cuts should be made in healthy wood 6-12 inches below cankers. Because pruning tools can spread the bacteria, it is important to disinfect pruning tools between cuts by dipping in a solution of one part bleach to nine parts water, or using another household disinfectant.

If fireblight seems likely to occur based on weather, plant susceptibility, past history, and local disease prevalence, blossoms can be given limited protection through application of a copper-containing fungicide. For larger plants, such treatment would need to be repeated and is impractical in most landscape situations. Protective sprays must be applied before infection occurs, and it's already too late this year to catch the beginning of the fireblight.

Succulent growth is more susceptible to infection. Excessive nitrogen, heavy irrigation, and heavy pruning force rapid growth. Try to be moderate with these cultural practices if fireblight is a problem.

Further information is found in the University of California Pest Note, *Fireblight*, publication no. 7414, available at the UC Cooperative Extension office, or via the web at: www.ipm.ucdavis.edu/pdf/pestnotes.

NITROGEN APPLICATION FOR LANDSCAPE PLANTS

The nutrient elements found in greatest quantity in plants are carbon, hydrogen and oxygen, all of which are obtained from air and water. After these, nitrogen is the nutrient most needed, and has marked effects on plant growth, especially in maintenance of green color and shoot growth rate. In the natural ecosystem, nitrogen is released from decaying organic matter in the form of the ammonium ion (NH_4^+) which is converted to nitrite (NO_2^-) and then to nitrate (NO_3^-) by bacteria. Most plants absorb nitrogen in the nitrate form. This process is temperature dependent, slow in winter but rapid in summer. Because of the negative charge of the nitrate ion, it is not bound to soil particles, which also have negative charges. Nitrogen is easy to add from fertilizer, but nitrate can leach through soil and contaminate ground water. Therefore, it is best to add nitrogen in increments according to plant needs. Most Kern County soils contain little nitrogen reserve because of their low organic matter contents. Compost or other organic materials also contain nitrogen, but at low concentrations of 1-5%, and nitrogen from these is released slowly.

Landscape plants and turfgrasses have varying needs for nitrogen. Plants which grow rapidly, or from which parts are removed through mowing or for harvest, usually have a higher need for nitrogen than do shade trees and shrubs. A useful reference number in horticulture is the general rate of nitrogen application, which is 1 lb actual nitrogen per 1000 square feet. By using this general rate, the rate of application of common fertilizers can be calculated. The first number on a fertilizer label is percentage nitrogen contained. For example, for ammonium sulfate, 21-0-0 so containing 21% nitrogen, 1 / 0.21 = 4.76, or about 5 lb ammonium sulfate needed to supply 1 lb nitrogen. Therefore, about 5 lb ammonium sulfate per 1000 sq ft would be needed to supply nitrogen at the general rate.

Although fertilizers vary in nitrogen content and the content of other nutrients, a few percentage point differences are usually unimportant. Although fertilizers may be marketed with photos of citrus, tomatoes, watermelon, etc., on the package, the fertilizer materials are often similar from product to product. It is not necessary to buy a different fertilizer for every plant in the landscape! Fertilizers are often more expensive for various conveniences, e.g., forming the product into stakes, making the product very water-soluble, or providing nitrogen in a slow-release form.

For common landscape and garden situations, the following nitrogen (N) rates are suggested:

- For turfgrasses, the N rate can be 1-2 lb actual N/1000 sq ft per growing month. This is a high rate used for intensively maintained turfgrasses. In parks, perhaps no nitrogen is applied. For low maintenance turfs, a single application of N at 1 lb actual N per 1000 sq ft may be made in spring, and an additional application in fall. For home lawns, nitrogen can be applied at 1 lb actual N per 1000 sq ft periodically during the growing season; for example, one application every six – eight weeks, about the time it takes quick-release fertilizers to be consumed.
- For vegetable gardens, nitrogen may be applied preplant at 1 lb actual N/1000 sq ft and tilled in, followed by another application during fruiting.
- For trees, a single application of 1-2 actual N per 1000 sq ft beneath the tree crown is usually sufficient, if desired. Fruit trees generally need N applications every season; shade trees do not.
- Most landscape plants do not need annual N fertilization when mature. It is usually best to maintain them at a slow growth rate so the landscape does not become overgrown and need premature replacement. When landscapes are newly established, one or two applications of N per year at 1 lb actual per 1000 sq ft may be helpful in bringing the landscape to maturity.

SAVING WATER IN LANDSCAPE IRRIGATION

In urban areas, about half of household water use is for outdoor purposes, and of that fraction about half is used for landscape irrigation. Since an increasing number of us have water meters, and as urban areas increase in size accompanied by needs for water, landscape water conservation becomes a greater priority both individually and collectively. It is usually possible to significantly reduce water consumption without major changes to a landscape or irrigation system. Class discussions and conversations indicate people often think first of changing plants to save water, but irrigation scheduling is actually more important, since even with a landscape composed entirely of drought-tolerant plants the irrigation schedule will determine how much water is used. In the following discussion, I offer considerations and suggestions for reducing landscape irrigation amount beginning with the most effective steps.

The irrigation system should be run periodically when the operator can check valve operation and make adjustments, such as modifying direction of sprinkler heads or raising them. A system check also includes repairing missing sprinkler heads, cleaning screens in the heads, cleaning emitters, and fixing leaks. March is a good time to check the system, and that can begin by removing a sprinkler to flush the line.

The simplest and easiest way to conserve irrigation water is to reduce the application amount. With an automatic irrigation system, clock adjustments should be made at least quarterly during the year. With normal winter rainfall, irrigation systems may be shut off during winter. Water use by plants changes tenfold from winter to summer throughout Kern County, and if summer settings are not altered water is wasted during most of the year. Fall and spring are transition times when careful managers may want to adjust clock settings every month. Some clocks have a water budget feature allowing a percentage change for all circuits, so watering times can be easily increased or decreased during weeks of usually warm or cool weather. When irrigating, it is best to wet the entire root zone of plants, if possible, and so changing the number of days per week rather than the runtimes per zone is preferable for making seasonal adjustments.

In a landscape, the manager may have little idea of what the initial time settings ought to be. A simple water audit can establish baseline information from which future schedules can be calculated. To perform a water audit in a small landscape, sprinklers are run for a specific time, with water caught in cans or coffee mugs spaced evenly across the delivery area. The water depth is measured to give a precipitation rate in units of inches per run-time. If the precipitation rate is known, it can be compared to plant water needs. In general, average per-day water requirements for landscapes in the valley portion of Kern County are 0.25, 0.16, 0.02, and 0.15 inches for summer, autumn, winter and spring, respectively.

Soil and plants should be monitored and irrigation adjusted accordingly. Plants indicate moisture stress by color change, or in more advanced condition, by wilting. Soils can be occasionally checked with a soil probe or screwdriver to gauge the depth of water penetration. If runoff occurs, multiple short cycles may be necessary to apply the needed amount of water. Some types of turf heads, such as stream rotors, offer low precipitation rates for soils with low infiltration rates. Early morning is the best time of day to irrigate to minimize water loss from wind and evaporation. Mulching around plants can reduce soil evaporation and help provide more uniform moisture.

A non-uniform irrigation system, especially on turf, can waste large amounts of water, because it is common for homeowners to irrigate until the driest spot is wet, which may result in twice as much water as needed in other areas. In general, the output from a sprinkler should reach the adjacent sprinkler (head-to-head coverage). High overall uniformity can be obtained with single-stream heads, stream rotors, or impact sprinklers. Fan-sprays are more difficult to work with to achieve high coefficients of uniformity but are needed for irregularly shaped areas. For shrubs, groundcovers and trees, drip irrigation is often a useful method for water delivery.

The landscape design, including the irrigation design, often sets limits on water conservation. Plants with similar water requirements should be in the same irrigation zone, and plants on the same irrigation line should need similar amounts and frequency of irrigation. For example, in a residential landscape, turf should be irrigated from one or more lines, shrubs and groundcovers on others, fruit trees on others, and so forth.

These plant types may need different frequencies of irrigation, in other words, more or fewer days per week. Low-priced irrigation controllers used for home landscapes may not allow setting days on/off independently for each valve. Improved controllers are now available that allow greater flexibility in scheduling. For a drip system, one cost-effective solution is to have two inexpensive irrigation controllers, one for valves operating most days per week, and a second for valves operating once or twice per week for long periods of time.

DRIP IRRIGATION FOR HOME LANDSCAPES

Drip irrigation was developed by the Israelis so that poor quality water could be used in field agriculture. Water high in salts could be applied constantly at the base of a plant, moving salts away from the center of the plant root system to the periphery of the roots. We don't use drip that way, since water quality is usually good for home systems and Kern agriculture. Rather, we use drip irrigation as a delivery system and a way of applying water precisely.

For a home landscape, let us consider two approaches for installing drip. The first is to connect black poly hose to a riser and to place emitters on the poly hose at the locations of plants. There are a number of different emitter types, including small sprinklers. Installation is easy, simply a matter of punching a hole and inserting the barbed fitting of the emitter. Because of the slow delivery rate of emitters, dozens can be placed on a single poly line without pressure loss in the line. I prefer to stay with 2 gal per hour or greater flow rates for the emitters, since lower flow rates can result in clogged emitters. However, for this approach to work well, an inexpensive pressure-reducing valve is needed at the beginning of the drip system, often installed at the beginning of the poly line. Most home irrigation systems, like the main household water line, operate at about 50 psi, or more. At that pressure drip emitters will blow off. A poly line should have a pressure of around 20 psi, easy to obtain with a pressure-reducing valve.

Another approach for installing drip in selected areas of a landscape is to purchase drip heads that thread directly onto risers. These heads contain a pressure-reduction feature, so it is possible to simply install them (with Teflon tape), adding spaghetti lines to reach plants if needed. The flow rate is controlled by the color-coded head.

Agricultural suppliers usually have standard sizes of drip hose and emitters, whereas the home stores may carry brands with odd sizes to encourage brand loyalty. The ag or irrigation stores may also have lower prices and a wider selection of compatible fittings for drip irrigation.

FALL 2013 HORTICULTURE CLASSES, I and IV

For more than 25 years we've offered horticulture classes to the community, and we are pleased to do so again this autumn. Upcoming classes can benefit homeowners by conveying knowledge of how to take care of turf and landscape plants as well as how to grow food, including vegetables and fruits, saving time and money. We emphasize water conservation and non-chemical alternatives to pesticides.

The classes have also been attended by many in the turf and landscape industry, since we offer research-based information on how plants grow and up-to-date information on pest management and irrigation practices. Representatives from homeowners associations and real estate professionals may also wish to attend to pick up tips on evaluating landscapes, using appropriate terminology to request work from landscape contractors, and evaluating work that is done.

We plan to offer Horticulture for Landscapes, Gardens, and Orchards, level I, as well as Horticulture IV. We have not offered the IV level class for several years. We have not yet chosen the nights for these classes, but expect to announce in later June or early July. Per our usual arrangement, we expect to begin in later August and conclude in December, with one class meeting per week, 5:30-8:30 p.m.