Landscape IPM Advisory

Weekly Pest Update for Woody Ornamentals, Utah State University Extension, **April 10, 2008**

What's In Bloom

(Salt Lake City area)

Plants are still slow to move due to cold weather, but predictions for this coming week should speed up spring.

Aspen: bloom
Forsythia: begin bloom
Willow: bloom
Silver maple: full bloom
Star magnolia: begin bloom
Red maple: bloom
Witch hazel: full bloom

Insect/Disease Information

Sycamore Anthracnose

In Utah, anthracnose is most severe on sycamore, but can also occur on maple and oak. Sycamore anthracnose is caused by a fungus (*Apiognomonia* sp.) that attacks twigs, branches, leaves, and buds. It causes small cankers to form on twigs, and large, necrotic lesions to form on leaves. Premature leaf drop is common, but the tree will refoliate within 6 weeks. Symptoms will be worse during cool, wet springs.

It overwinters on twigs and buds, and as new leaves emerge in spring, they become infected by rain-splashed spores. Repeated killing of twigs and branches results in witches brooms, shown above. Anthracnose will not kill trees, and general sanitation and maintenance of tree health are usually all that is necessary in management.

Treatment: For high-value trees that are repeatedly infected, a fungicide program may be warranted. Fungicide sprays must be started before budbreak, and continued according to the product label until leaves are fully expanded. They are only useful in preventing the current season's infections and must be repeated yearly. Materials include: chlorothalonil (Applause, Initiate), copper (Bonide, Champ, C-O-C-S, Kocide, Nu-Cop), mancozeb (Junction).

Injection of fungicide into the root flare location can help halt spread and possibly control the disease for several years. Materials include thiabendazole (Arbotect), and propiconazole (Alamo, Fathom, Kestrel).

Cankerworm Eggs

Larvae of spring cankerworm and fall cankerworm feed on maples, cherry, birch, linden, ash, and other deciduous species. The population was fairly high last year and another population surge is expected for this season. Several egg masses were found on host trees in Weber, Salt Lake, and Cache counties. They are laid in conspicuous locations such as at branch collars (see above), along stems, and in cracks and crevices. If you saw

Contact:

Marion Murray
435-797-0776
marionm@ext.usu.edu
www.utahpests.usu.edu/ipm

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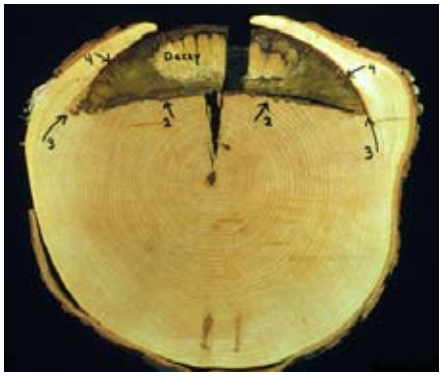
feeding by cankerworm last year, look now for the egg masses on the same trees. Mark one with flagging and watch it daily as leaves begin to emerge.

Treatment: Before egg hatch, horticultural oil can kill a percentage of the eggs. After egg hatch, treat with Bt (*Bacillus thuringiensis*; Dipel, Foray, Xentari) or spinosad (Conserve, Entrust), starting at 10 days after hatch. These are the safest and most effective treatments, but won't work on larvae greater than 1/2-inch long.

A Fungus Amongus

With all the moisture we've had this spring, it's not surprising to see some mushrooms. Those that are associated with living trees will require a second look. These mushrooms (at right) are growing from the base of an aspen, and although we are not entirely sure what species it is, it certainly means that there is some decay at the base of the tree. Mushrooms are the fruiting bodies of fungi, like apples or cherries are the fruits of the trees. The main body, or thallus, of the organism is underground, made up of white mycelium that covers a large area. Decay fungi are opportunistic, and enter wood through a wound, caused by mechanical injury, or insect or rodent feeding.

Fruiting bodies of fungi on trees indicate internal decay, and require a close examination of the safety of the tree. If the tree is in a high traffic area or near dwellings, it could be a hazard, and should be assessed for removal. The decayed wood can be brittle or stringy, weakening the tree structure at the decay site.



Otherwise, some trees can continue to live and grow despite the decay. To some extent, they are able to "compartmentalize" areas of decay, preventing it from spreading to healthy wood. This is done through plugging vascular tissue, growth stimulation in interior radial and tangential walls, and growth of a protective cambial layer.

Winter Injury

Dessication

Some plants, like mahonia and other broadleaved evergreens, are susceptible to drying in winter. This occurs when the plant transpires water during warmer temperatures or wind, and is unable to absorb replacement water through the roots. A deep soaking of water in fall and thick mulch can help to reduce plant dessication. Plants that have been affected by winter dessication recover with a new flush of foliage.

Snow Damage

It is no surprise that some shrubs suffered under the weight of the snow this winter. Where limbs have broken, prune them out down to a secondary branch without leaving a stub. With some fertilization, mulching, and pruning, these plants will recover. To prevent breakage next winter, brush heavy snow off limbs as soon as possible.

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Degree Days and Pest Monitoring Timeline

Upcoming Monitoring/Insect Activity

Pest	Degree Day Timing (base 50)	Indicator Plant
White pine weevil	Adults active at 7-58 DD	Silver maple first bloom
Spruce spider mite	Egg hatch at 7-121 DD	Silver and red maple bloom
Smaller European elm bark beetle	Adults emerge at 7-120 DD	Silver and red maple bloom
European pine shoot moth	Larvae move to new shoots at 50-220 DD	Red maple first bloom
Honeylocust plant bug	Nymphs emerge starting at 58 DD	Red maple bloom, Japanese quince begin bloom
Western tent caterpillar	Eggs begin hatching at 100 DD	Forsythia full bloom

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Wildlife Damage

Deer, mice, rabbits, and other wildlife can cause damage to landscape plants through feeding and antler rubbing (shown below). Protect trees in fall by loosely wrapping with wire mesh or plastic tree guards. (Remove the plastic guards in spring.) If high enough, these can also protect from antler rubs, although this type of injury is rare in urban areas.

If you have discovered wildlife injury this spring, there is little to be done except to remove loose bark and reduce plant stress with optimal watering, mulching, and fertilization. Eventually the tree will compartmentalize the damage as described on the previous page.

Current Degree Days (base 50)

March 1 - Wednesday, April 9

County	Location	GDD (50)
Box Elder	Perry	25
Cache	North Logan	8
	River Heights	8
	Smithfield	8
Carbon	Price	22
Davis	Kaysville	36
Grand	Castle Valley	120
Salt Lake	SLC	32
	West Valley City	35
Tooele	Erda	47
	Grantsville	50
	Tooele	49
Utah	Alpine	25
	Genola	48
	Lincoln Point	---
	Orem	46
	Payson	55
	Provo	50
	Santaquin	39
	West Mountain	45
Weber	Pleasant View	28

Production Information

Understanding Degree Days and Indicator Plants

Insects have a predictable development pattern based on heat accumulation. They are exothermic ("cold-blooded") and their body temperature and growth are affected by their surrounding temperature. Every insect requires a consistent amount of heat accumulation to reach certain life stages, such as egg hatch or adult flight. Degree day values interpret that heat accumulation. When used to determine treatment timing, degree days are an important component of an Integrated Pest Management program, providing a cost effective tool to reduce insect feeding damage.

Simply put, a degree day (DD) is a measurement of heat units over time, based on temperature. Degree days are based on the rate of an insect's development at temperatures between upper and lower limits called the lower development threshold (or baseline) and upper development threshold. The lower and upper thresholds vary among species, and have been determined by researchers for several, but not all, major insect pests. For those whose exact values are unknown, including most landscape insect pests, a baseline temperature of 50˚F is used.

Calculation

In general, degree days can be calculated using a simple formula for the average daily temperature, calculated from the daily maximum and minimum temperatures, minus the baseline (lower developmental threshold):

[(daily maximum temperature + daily minimum temperature)/2] – baseline temperature.

For example, a day where the high is 72˚F and the low is 44˚F would accumulate 8 degree days using 50˚F as the baseline:

Example: [(72 + 44)/2] – 50 = 8.

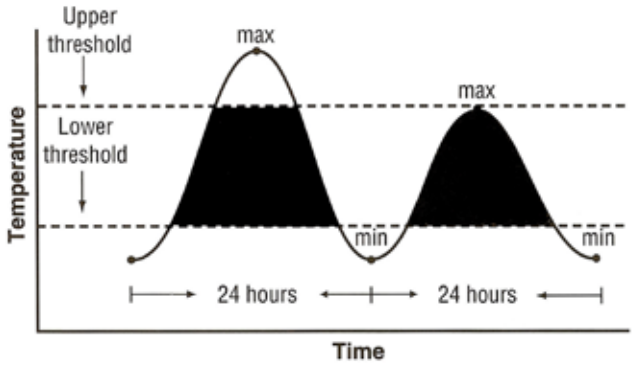
When temperatures do not exceed 50, zero degree days have accumulated. This calculation method is the simplest and least precise.

A more precise and commonly used method of calculating degree days is called the modified sine wave. This method is based on the assumption that temperatures of a 24-hour day follow a sine wave curve. The number of degree days is then calculated as the area under this curve within the lower and upper temperature thresholds (see Figure 1).

Using Degree Days

Degree days are useful because they predict when insect life stages will occur. Some life stages are more vulnerable than others, such as egg, nymph, or larva, and targeting an insecticide application to a vulnerable life stage is more effective than using a calendar date.

Figure 1. The number of degree days between an upper and lower threshold for a 24-hour period is represented by the area shaded in black.



Limitations of Degree Days

The primary limiting factor in using degree days is obtaining accurate temperature readings. If the location of the thermometer is not representative of the environment in which the target insect occurs, the degree days calculated from that thermometer will not mirror the actual insect development. In addition, temperatures at one site may not be reflective of conditions in another site several miles away. This is particularly true of Utah, where mountains, lakes, and deserts result in a wide variety of microclimates.

Using Indicator Plants as an Alternative to Degree Days

Plants also tend to follow a predictable pattern of development that can be interpreted in degree days. Some plants flower or set seed at the same time as certain insect pests, and are considered indicator plants. Following the physiological events of indicator plants can be used instead of degree days to predict insect activity and thus time insecticide treatments. For example, when forsythia is in full bloom, the western tent caterpillar starts hatching, and lilac/ash borers emerge about the same time as common lilac is in bloom.

One can develop a biological calendar showing the sequence of bloom and insect emergence for later use in scheduling pest management activities. Typically, one year of observations is enough to create a biological calendar for your area.

Although there are deviations, sequential calendars from one region can be applied to another region. The insect degree day and indicator plant information provided in these advisories is from studies conducted in Ohio, Michigan, and New York.

Degree days and plant indicators can be used independently of each other to help predict pest activity or time insecticide treatments. The are both better methods than using a calendar date, and are well-suited to effective IPM programs.

Precautionary Statement: All pesticides have benefits and risks, however following the label will maximize the benefits and reduce risks. Pay attention to the directions for use and follow precautionary statements. Pesticide labels are considered legal documents containing instructions and limitations. Inconsistent use of the product or disregarding the label is a violation of both federal and state laws. The pesticide applicator is legally responsible for proper use.