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PLANT DISEASES

Spruce Needle Cast Look-Alikes

Rhizospheara needle cast was discussed in issue 3. It is the most common needle disease on spruce in Illinois. It discolors second-year and older needles, often resulting in defoliation of all but the newest needles. Damage is usually scattered hot spots but may be more uniform. **Spider mites** also cause similar discoloration and may cause defoliation of affected needles.

Rhizosphaera, however, develops fungal fruiting bodies (spore-containing structures) on infected needles. It might be necessary to place some affected needles in a moisture chamber (plastic bag with moist paper toweling) overnight to encourage growth of fruiting bodies. Look for pinhead-sized black structures poking out of the needle through leaf pores. A hand lens is usually required to observe these structures, which occur in rows. They do not easily rub off because they are embedded in the tissue. If you leave the material in a plastic bag for a couple of days, all sorts of superficial molds grow on the needles, making disease identification difficult.

Spider mites occur most frequently in the spring or fall. Pinhead-sized, they are visible with a hand lens. Even if mites are not present, injury may be visible as yellow, speckled needles, often with a gritty surface, possibly with webbing and possibly with clear eggs on the needles. You can determine whether mites are present by using this simple test. Hold a piece of white paper below a branch and strike it sharply. If mites are numerous, they are knocked onto the paper, where they can easily be seen. Slow-moving, green-to-gray mites that streak green when squashed are probably plant-feeding mites. Faster-moving mites that streak red when squashed are probably predatory mites that feed on the plant-feeding mites.

Some nutrient stress problems can also affect older needles and can also cause yellowing or mottling. If fruiting bodies of *Rhizosphaera* are not found, and if mites and mite injury are not apparent, consider nutrient stress. We have seen micronutrient stress on spruce in drought or where the soil pH is very high and micronutrients unavailable. Often, applying a chelated micronutrient spray causes foliage to darken in a couple of weeks. If so, test the soil pH to determine what long-range action needs to be taken to correct the problem. *(Nancy Pataky)*

Birch Troubles

We have many inquiries at the Plant Clinic concerning stressed birch trees. Complaints usually follow this scenario: The birch leafs out normally in the spring, after which all the leaves on a branch or two quit growing, wither, and die. Eventually, the affected branches die, too. Often the tree has yellow–green leaves with branch tip death.

There are many diseases of birch but few that cause the dieback symptoms described. Leaf blights do not, nor do viruses or wood rots. Potential pathogens are the canker fungi *(Botryosphaeria, Nectria, Physalospora, Diaporthe,* and many others) and a dieback disease caused by a fungus, *Melanconium*. The dieback disease is closely related to canker problems. In all cases, the tree is infected when under stress. *Melanconium* causes a progressive dieback of upper branches, especially following drought. Conditions last summer, fall, and winter set up the decline process. The canker fungi could also infect trees predisposed by drought, injuries, flooding, borers, etc. Usually, more than one factor is involved, and it is impossible to determine which started the decline.

Michael Dirr, in *Manual of Woody Landscape Plants,* says that most birches do best in well-drained, acidic, moist, sandy or silty loam soils. He states that he would not plant a river birch *(Betula nigra)* unless the soil pH is 6.5 or below. Some birches are more adapted to a variety of soil types and moisture levels but become very chlorotic in our high-pH soils. Refer to the *Report on Plant Disease,* no. 603, "Iron Chlorosis of Woody Plants: Cause and Control," available in U of I Extension offices or on their VISTA Web site.

Each birch in decline is different because the stress varies with each tree and on the particular site. There is no current disease epidemic on birch. In most cases, it appears that last year's drought stress, compounded by high-pH soils, has probably stressed these trees, predisposing them to infection by canker and dieback fungi. There is no easy cure. Remove dead limbs to avoid problems with wood rot. Water in periods of drought stress, providing an inch of water per irriga-

tion period. Test the soil and find out pH level so you can determine whether an acidic fertilizer is needed. Look for cankered areas on the wood and remove them where possible. Last, do some research to find out the particular needs of your birch species. If planting a new birch, do the research first. *(Nancy Pataky)*

Rudbeckia Leaf Spot

Many rudbeckia species are available to gardeners. You may know them as black-eyed Susans or orange coneflowers. One particularly unappealing disease of this species is **Septoria leaf spot,** caused by a fungus, *Septoria rudbeckiae*. It is prevalent now in Illinois. The dark brown leaf spots are hard to miss, starting as 1/8-inch spots but quickly merging into large, brown areas on otherwise dark green leaves. The disease begins on lower leaves and progresses up the plant.

Another problem that might look similar is a bacterial disease, **angular leaf spot.** A lab can easily distinguish the two. Angular leaf spot produces bacterial streaming from sections observed with a microscope. Septoria leaf spot produces fruiting bodies embedded in the spots. The fuiting bodies produce diagnostic, long, narrow spores.

Disease spread depends on leaf moisture. With recent rainfall in Illinois, there is not much you can do to stop spore splashing. Still, you can help prevent further disease spread by watering the soil, as opposed to syringing the foliage. Also try to prevent overcrowding of plants and keep weeds under control.

Preventive fungicide applications protect new growth from Septoria leaf spot. Sprays should begin before symptoms appear, but there may be some benefit to newly forming leaves. Copper-based fungicides have some effect against both Septoria and the bacterium causing angular leaf spot. Copper products have protective–contact activity. A systemic product registered for this use by homeowners is Heritage. The active ingredient is azoxystrobin. *(Nancy Pataky)*

Oak Wilt Update and Pruning Oaks

The oak wilt disease was discussed in issue 9. If you are considering pruning oaks, it is important to know whether oak wilt is present in your area. If you prune oaks during the growing season when sap is flowing, infested beetles may be attracted to your tree, bringing with them the oak wilt fungus. Most city arborists and state foresters are aware of outbreaks. Extension horticulture specialists are also aware.

So far this year, the Plant Clinic has confirmed cases of oak wilt in DuPage, St. Clair, and Vermilion counties. In 2002, the clinic did so for Carroll, Cook, DeKalb, DuPage, Lake, Lee, Madison, McHenry, McLean, Tazewell, and Woodford counties.

This information is limited, reporting only on Plant Clinic samples. I do not mean to imply that oak wilt is not in other counties. For example, it has been found in Champaign County but not confirmed at the clinic in the past 2 years. This information still has great value. If you live in one of these counties, know that recently confirmed cases of oak wilt have occurred. Do not prune oaks during the growing season in those areas if you can help doing so. *(Nancy Pataky)*

INSECTS

Gypsy Moth: Mating Disruption and Trapping

During this time of year, gypsy moths are in the adult stage, with the males flying around looking for females to mate with so that they will lay viable eggs. It is during this time that management strategies are implemented to prevent mating and determine the extent of infestation. This effort includes the distribution of pheromone flakes and placing traps in selected locations in front of a gypsy moth infestation.

Pheromone flakes. Use of pheromone flakes is a pest management strategy, mating disruption, in which the goal is to prevent adult male gypsy moths from mating with females. Pheromone flakes are typically applied after the caterpillars enter cocoons and emerge as adults. Flakes are applied by aircraft flying about 50 feet above the tree canopy—under the supervision of local authorities, the Illinois Department of Agriculture, and the United States Department of Agriculture.

Each flake is an elongated piece of plastic, about 1/8 inch long. They are applied at such a low rate that most people do not notice them. The flakes won't remove the finish from automobiles or vinyl siding. The flakes release a synthetic version of the pheromone (disparlure) that the adult female gypsy moth releases to attract males. When the flakes are applied, so much pheromone is detected by the male gypsy moths, and coming from so many directions, that the male moths become confused. They typically sit, flutter their wings, and do not fly or mate. As a result, unmated females lay infertile eggs that do not hatch.

Pheromone flakes are only effective on relatively small populations (30 moths per trap or fewer than 10 eggs per acre), where chance encounters are unlikely. If populations are large, then females are present in numbers that males will find and mate with enough of them to keep the infestation high.

Traps. To determine the spread of gypsy moth, both federal and state regulatory agencies conduct comprehensive trapping programs. Pheromone traps are used in monitoring moth males (as males fly and females do not). These delta, or milk-carton, traps are cardboard, triangular-shaped, and 6 to 10 inches long

and 3 to 4 inches wide per side. They may be lime green, orange-red, or brown. Traps are open at each end and sticky inside to capture any moth that enters. They are placed about 5 to 6 feet off the ground on tree trunks, poles, and other surfaces.

Traps are distributed in areas known to have gypsy moth and at the leading edge of an infestation to track the rate of spread. Traps are placed gridwise, depending on the likelihood of gypsy moths' being present. In many areas, the traps may be placed more than a mile apart, such as in rural areas with few host trees. Where few gypsy moths are known to occur, traps are placed much closer to assist in locating infestations.

Traps are baited with a synthetic lure that mimics the pheromone released by the female gypsy moth to attract the male. Males enter the trap looking for a female producing the pheromone and get stuck. Collecting males makes it possible to determine if gypsy moths are present and provides a rough estimate of how numerous they are. In September, the male moths in traps are counted to determine the extent of the problem. This provides a means to determine the potential infestation of an area and to decide if a quarantine should be implemented. The traps do not contain insecticide.

Do not disturb or move gypsy moth traps, and do not put out your own traps unless the area is generally infested. Capture of gypsy moths in traps does not necessarily mean that gypsy moths have become established. When many gypsy moths are detected in traps, an area may be quarantined. Moths other than gypsy moths may inadvertently enter the trap.

Gypsy moth is a federally quarantined pest, and the detection program involves trap tenders and other official personnel that have the right to trespass on any property. If the trap needs to be removed, call the phone number on the trap. Traps are generally removed in July or early August. *(Raymond A. Cloyd)*

White Grubs

Adults of masked chafers (annual white grubs) and Japanese beetles are slow in emerging this year, probably due to the long, cool spring. Many insects have emerged about a week later than normal.

Weather conditions are ripe for a large grub infestation. After adequate rains in the spring, many areas had little rainfall recently. Lack of rain and presence of sunny skies is causing nonirrigated turf to become dormant. This will cause the adult Japanese beetles and masked chafers to concentrate their egg-laying in green, irrigated turf, which should result in damaging numbers of grubs from mid-August into October.

Applying imidacloprid (Merit) or halofenozide (Mach 2) during July is recommended for irrigated turf to prevent damage later. Both insecticides take about 3 weeks to kill grubs but last for months. They are most effective on small, newly hatched grubs.

Watering in the insecticide with at least 1/2 inch of water is recommended. Mach 2 is quite water-soluble, and dried residues readily wash off the grass and into the root zone with rainfall. However, ultraviolet light (sunlight) is a major factor in the breakdown of many pesticides, and leaving the insecticide residue in strong sunlight on the grass waiting for a rain may result in some breakdown of product. Also, insecticide on the grass blades and thatch is not in the soil controlling grubs. Because the grubs do not hatch until late July, applications at that time should be watered in so that activity against the grubs starts as soon as possible. In any case, if rainfall has not occurred within 3 or 4 days after application, irrigating the insecticide into the soil would be a good idea.

You will want to cut through and pull back treated turf in August to make sure that the insecticide was effective. Wait at least 3 weeks after the application. You will also want to check lightly irrigated or nonirrigated, untreated turf in early August to determine whether a spot-rescue treatment with trichlorfon (Dylox, Proxol) is needed. *(Phil Nixon)*

WEEDS

Weedy Members of the Carrot or Parsley Family—Watch Out!

A couple of years ago, I was introduced to **wild parsnip** *(Pastinaca sativa).* It was growing in the ditch, and I was reaching for it when four family members screamed, "Don't touch! Get back." The plant looked harmless, like a wild carrot; but I learned that day about one more plant to add to my "don't touch" list.

Wild parsnip, or poison parsnip, is not really poisonous; however, it can cause sun-induced blistering or "burns" on the skin. The sap contains chemicals, furocoumarins, that cause phytophotodermatitis. Basically, if your skin absorbs these chemicals and is then exposed to sunlight, an interaction takes place; the result is reddened, burned-like skin and/or blisters. For more information on diagnosing this reaction, check out David J. Eagan's article, "Burned by wild parsnip," *Wisconsin Natural Resources Magazine,* at **http://www.wnrmag.com/stories/1999/jun99/parsnip.htm.**

I now know that wild parsnip can be quickly distinguished from many of its weedy cousins by its yellow flowers. Also, the leaves are pinnately compound, divided once into more than five leaflets with coarsely sawtoothed edges, and they are hairless.

Wild carrot *(Daucus carota),* or Queen Anne's lace, has leaves that are many times pinnately com-

pound, finely dissected, and hairy. It also has umbel flowers, but the petals are white not yellow. You can fill vases with the pretty, lacelike flowers and most likely remain blister free; but resist the urge to plant this plant in your garden, as it spreads rampantly.

Poison-hemlock *(Conium maculatum)* is a similar, related species. This time, the name is accurate as the entire plant is very poisonous, containing toxic alkaloids that cause respiratory failure when ingested. Also reported are birth defects in livestock. Fortunately, this plant should leave you blisterfree. Like wild carrot, the flowers are white but smaller, only 1.5 to 2.5 inches compared to 3 to 6.5 inches. The leaves of wild carrot have a carrot scent. Likewise, wild parsnip smells like a parsnip. A crushed poison-hemlock plant smells unpleasant. It has smooth, purple-spotted, ridged stems that are hollow between the nodes. Wild carrot stems are quite different: bristly hairy, vertically ribbed, purple-spot-free, and not hollow. Wild parsnip stems are usually somewhat hairy and grooved. Stem size makes up for the smaller flowers; poison-hemlock grows erect, 2 to 7 feet tall, while wild carrot usually reaches 1 to 3 feet. Wild parsnip falls in the middle at 2 to 5 feet tall.

These three plants are all biennial weeds commonly found in roadsides, waste areas, pastures, meadows, and even landscapes. Each begins as a rosette, bolts in the second year, and produces many seeds. The underground portion consists of a fleshy taproot.

A few more distant cousins. Another member of the Umbelliferae family, **spotted waterhem-lock** *(Cicuta maculata)*, is often confused with wild carrot and poison-hemlock. This plant, however, has a cluster of fleshy taproots at its base. It is a perennial mainly found in wetter areas; all parts are poisonous if eaten.

Cow parsnip *(Heracleum maximum* or *H. lanatum)* is a biennial that occurs in 55 Illinois counties but is common only north of I-80. It too tends to be found in wetter areas. This plant reportedly causes dermatitis in humans; cattle can be poisoned by eating the leaves—which are enormous, up to 16 inches long and 12 inches wide! Fortunately, it's not considered to be very invasive or weedy.

Precautions. A good weed ID book can be beneficial. While hand-pulling or working around plants that cause skin conditions, it's advisable to wear long pants, long sleeves, and gloves. Working after sunset can help prevent blistering and burns, too. Mowing can reduce seed production. Applying herbicide to the rosette in the early fall or late spring can control many in this family. Repeat applications may be necessary. Suggested options include 2,4-D, dicamba, MCPP, MCPA, or metsulfuron. Spot treatments of glyphosate can be effective as well. As always, carefully read and follow all label directions. (*Michelle Wiesbrook)*

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