COOPERATIVE EXTENSION SERVICE
HOME, YARD & GARDEN PEST NEWSLETTER
College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana - Champaign
Illinois Natural History Survey, Champaign

No. 14 • July 29, 1998

HORTICULTURE

Yellow Nutsedge Invasion

Large populations of yellow nutsedge (*Cyperus esculentus*) have developed in areas that had wet weather this past spring and early summer. Also known as yellow nutgrass, yellow nutsedge is a warm-season perennial member of the Cyperaceae (sedge) family that reproduces by seeds and from tubers (nutlets). While its natural range includes most of the United States (including all of Illinois), this North American native plant is most troublesome in the southeast, including the southern portion of the Land of Lincoln.

Life cycle and appearance. Individual yellow nutsedge plants have upright, grasslike leaves that emerge from a fibrous root system, and scaly, white or light-colored rhizomes. The tubers develop rapidly six to eight weeks after the plants emerge, usually during late July and August, and can persist for many years in the soil. Forming at the ends of rhizomes (not in chains as occurs in other sedges such as purple nutsedge), the nutlets can reach up to 4/5 inch in length. New plants emerge from tubers from late May to mid-July. Leaves emerge from the plant's base, are three-ranked, grasslike, and light yellow-green, 1/8 to 1/2 inch wide, up to three feet long, and have parallel veins with a prominent midvein. The upper surface of the leaf is shiny or waxy, and the lower surface is dull. Nutsedge leaves grow rapidly during summer; they often grow above the canopy of cool-season turf. Nutsedge inflorescences (flowers) are flat topped and multiple branched with long, leaflike bracts beneath. The inflorescences resemble burrs and occur at the end of a stout, triangular (in cross-section), yellow-green stem. Each branch of the inflorescence is composed of multiple yellow-to-golden brown spikelets, each up to 1-1/4 inches long. The inflorescences appear July to September during 12-to-14-hour days.

Ecology. Yellow nutsedge is often an indicator of poor drainage. It grows on all soil types, especially wet or moist sites or sites receiving heavy irrigation. It usually appears on soils with a pH of 5 to 7. Yellow nutsedge does not tolerate shade and will tolerate dry sites once it is established.

Control. Due to the tubers' reproductive capacity, controlling yellow nutsedge is very difficult after the tubers have formed. To control without chemicals, maintain turf density and health through proper culture; mechanically remove or pull nutsedge plants soon after germination, and increase drainage in moist or wet areas. Mow low (to less than one inch on turf species tolerant of that practice) and frequently to reduce growth from the plant base. Purchase nutsedge-free sod and soil. Fertilize turf in autumn after nutsedge growth has slowed. Chemical controls for yellow nutsedge include fumigation and herbicides. Before planting in high-value sites contaminated by yellow nutsedge, fumigate with methyl bromide. Several postemergence herbicides can be used, but total control is often difficult and such products may require multiple applications. Basagran T/O (bentazon) is a contact herbicide and Manage (halosulfuron) is a systemic product that can be used. A third option is to use products containing MSMA, including Daconate 6, 912 Herbicide, MSMA 6.6, MSMA Turf, and Quadmec Trimec Plus (2,4-D + MCPP + dicamba + MSMA). Labels for these products provide information about adjuvants and additional recommendations for controlling this pesky plant. Turf managers have reported that applications of Roundup (glyphosate) have resulted in poor yellow nutsedge control. *(Tom Voigt; Bruce Branham, Associate Professor, NRES; and Bruce Spangenberg, Extension Educator)*

INSECTS

White Grubs

Adult annual white grubs—the southern and northern masked chafers—have been declining in numbers; their flight should be coming to an end. Japanese beetle adults were numerous in late June into early July, but their numbers have fallen off dramatically.

The question that arises is "Now that we know what the adult white grub flight has been and the weather conditions associated with it, should we treat for grubs and, if so, when should it be done?"

Throughout the state, there have been areas with large flights of masked chafer or Japanese beetle adults. This tells us that the beetles have been present to lay the eggs, which could result in large grub populations in late summer and early fall. Both the masked chafers and Japanese beetle prefer damp soil in which to lay their eggs. Japanese beetle is probably even more attracted to it than the masked chafers. However, throughout most of the southern two-thirds of Illinois, there has been enough rainfall to keep turf very green, whether it has been watered or not. In these conditions, eggs are usually laid over large areas, resulting in a small number of grubs—usually one to five—per square foot.

In northern Illinois, particularly in the northeastern section, rains have not been as widespread and frequent. Probably due to infrequent rains and high temperatures over the last couple of weeks, unwatered turf in Chicago and adjoining areas is becoming brownish. This situation causes the adult beetles to concentrate their egg laying in irrigated turf.

In areas where rains have been infrequent and unwatered turf is dry and brownish, preventive treatments for white grubs are justified in irrigated turf, particularly where there is a history of grub problems. Halofenozide (sold as Mach 2) or imidicloprid (sold as Merit) should be applied by the end of July (or, in northern Illinois, before the end of the first week in August). Both of these insecticides are effective but take three weeks to kill the grubs. Damage is unlikely to occur before the middle of August in southern and central Illinois and probably won't occur in northern Illinois until the third or fourth week of August.

In areas where unwatered turf is green, there are still likely to be spots where grubs are numerous enough to cause turf damage in August through the fall, especially in areas where Japanese beetle occurs. Browning of turf from white grub root feeding will be more likely if there is a prolonged dry period this fall. To keep on top of the situation, scout for grubs in early August, when most of the eggs should be hatched. In southern Illinois, scouting can begin in the last week of July.

Scout for white grubs by cutting through the turf with a heavy knife. Pull back the turf and count the white grubs in the root zone. Lightly till the soil with the knife to check for grubs a couple of inches deeper. This is particularly important if the soil is not moist in the root zone because the grubs will move deeper to find moisture. If you find ten to twelve or more grubs per square foot, treatment is justified. Raccoons, skunks, and birds will cause turf damage searching for grubs. If these animals are numerous in the area and you've experienced this type of damage before, realize that these mammals will dig when as few as three to five grubs per square foot are present.

To treat for grubs found in mid-August or later, use trichlorfon (Dylox, Proxol), bendiocarb (Turcam), or another quick-acting insecticide. These insecticides can also be used in late July in southern Illinois and early August in central and northern Illinois. *(Phil Nixon)*

PLANT DISEASE

White Pine Problems, Still!

White pine problems continue throughout the state, especially in central and southern areas. Symptoms vary but generally include needle yellowing or browning, shriveled bark on branches or trunk, sap exudate on branches, and in some cases, death of the tree.

The Plant Clinic has assayed samples for pinewood nematodes; has cultured for fungal pathogens of needles, stems, and roots; and has inspected for insect infestations or injuries. The only common factor seems to be root decline. Few live white roots have been found, but fungal pathogens cannot be correlated with poor rooting. It appears that roots are on the decline for other reasons, including heat, drought, flooding, and extremes in temperature and moisture.

Many of the problem trees we have seen have been situated on clay sites or exposed to the elements (planted in new housing developments or used as windbreaks). It is likely that site stress has contributed to the decline of these trees. The excessive rains of the past several springs also may have contributed to root injury and decline by saturating the soil and causing a lack of soil oxygen.

Look for more white pine problems this year. If roots were injured as we are suggesting, they will not be able to pull up enough water to replace the loss created by the extremely hot weather of the past two weeks. Symptoms may have been masked earlier in the summer in areas where water was abundant. In drought-stressed areas, watering helps, as does the use of a natural mulch over the root system. However, without adequate root mass, plants are not able to use the available water quickly enough to replace what is

used by the foliage. The result is sudden browning or off-color needles and death of branches.

Because these problems in white pine are not usually the result of an infectious disease, immediate removal of the tree is not necessary. Instead, try to keep the tree watered and see how it responds. Also, try digging into a bit of the root system for a better picture of the situation. If roots are brown in cross-section and the outer layer easily pulls off or is not present, then root injury has occurred. If the roots are white and healthy, then the problem is above ground and our theory is wrong, at least in your case.

Reports from Kentucky and other states suggest that this root decline is more of a problem in soils with very high pH levels. That certainly could be the case in many Illinois soils. Consider taking soil samples from root zones of affected and healthy trees to a soil testing lab nearby. If lab results show a very high pH level, start using the appropriate acid fertilizer to help compensate. *(Nancy Pataky)*

Red Spot, Leaf Blotch, or Measles of Peony

If you have seen peonies, you have most likely seen this disease. It goes by many names, but red spot seems most descriptive. The disease is caused by a fungus, *Cladosporium*, that grows superficially on leaves, stems, and petioles, causing unsightly spotting but not significantly affecting plant vitality. It does not cause early leaf drop or stem dieback.

Small, circular, red or purple spots appear on the upper surface of young leaves just before the peony blooms. Later, the spots appear on the underleaf surface. The lower sides on infected leaves soon turn dull chestnut brown, while the upper surfaces are glossy dark purple. The mature leaf blotch phase is late in the season (occurring now) and is quite unsightly. The lesions coalesce and form large, irregular, unsightly purple blotches. Also, it is this stage that produces overwintering inoculum for next year's infection.

Peonies vary in their susceptibility to this disease. The older varieties that many of us have in our sentimental gardens are the most susceptible types. The vigorous, thick-stemmed, newer varieties available show little disease development.

As with many of the fungal leaf diseases, you cannot improve the situation once disease is present or once the new growth for the year is completed. Many of the fungicides available for disease management are preventive. They are applied to protect leaves from infection, to prevent fungal sporulation, or to otherwise interrupt the fungal life cycle.

Infected peonies cannot be helped this late in the season. Recognize the disease now and plan to manage it next year. This fall or early next spring, remove all old top growth to ground level and destroy, bury, or remove it from the garden. Just before the shoots break through the soil surface in the spring, spray the soil around the plants with mancozeb, maneb, thiophanate-methyl, or copper fungicides. Be sure to soak the soil surface area, stem stubs, and any remaining peony debris. Spray the plants weekly during cool, damp, overcast weather, starting when new shoots are two to four inches tall and continuing until the flowers begin to open. If this sounds like too much trouble, consider replacing your peonies with newer resistant varieties, or just put up with the disease. For more details consult *Report on Plant Diseases* No. 631. (*Nancy Pataky*)

Root Rots of Annuals and Perennials

All garden flowers may be affected by one or more root rots, and symptoms vary, making field identification difficult. Often there is not time to wait for a laboratory culture to identify the exact problem, so what do you do?

First look closely at the symptoms to establish that a root rot is involved. Plants may be stunted or low in vigor, may grow slowly, or may wilt easily on a warm day. The foliage may turn yellow to brown and drop prematurely, usually starting with the older leaves and moving up the plant. The severity of the root rot will depend on the fungal pathogen, the susceptibility of the host plant, and the soil conditions.

If a root rot is suspected, carefully remove the plant from the soil, gently wash off the roots, and examine them for indications of rotting. (If roots are washed too vigorously, the rotted tissue will be washed off, often leaving a white root interior that appears healthy. Wash the roots by gently moving the plant up and down in a bucket of water until soil is removed.) A healthy plant has numerous white roots that appear fibrous. Roots of a diseased plant show various degrees of water-soaking and usually are some shade of brown or black. The discolored roots are often soft and mushy, while healthy roots are firm.

There are many root rot pathogens, but the major root rot fungi encountered in flowers are *Rhizoctonia*, *Fusarium*, *Pythium*, and *Phytophthora*. In a very simplified scheme, we can group the first two fungi as those causing a dry rot, often with a reddish pink cast to affected roots. *Pythium* and *Phytophthora* can be grouped as the types causing a soft, brown-to-black rot of roots.

Control of root rots should be aimed at prevention: Plant resistant varieties, use healthy transplants, prepare the site properly to provide good water drainage away from roots, use balanced fertilizer, and rotate garden plantings for two or three years with unrelated annual flowers to help prevent the buildup of pathogens in one area. Remove crop residue at the end of the season to help reduce pathogen survival.

Even if all of the above practices are followed, root rot may still occur. Fungicides are available to control the major groups of fungi discussed here. The fungicides will protect plant stems and roots not yet affected. Fungicide use is indicated in cases where a root rot is discovered in a flower bed and the goal is to preserve remaining healthy plants to the end of the season. Specific chemicals are listed by host crop in the *Illinois Commercial Landscape and Turfgrass Pest Management Handbook, 1998–1988* and the *Illinois Homeowners' Guide to Pest Management. Report on Plant Diseases* No. 615 contains more details on root rots of garden plants. *(Nancy Pataky)*

Home, Yard and Garden Pest Newsletter is prepared by Extension specialists from the University of Illinois at Urbana-Champaign and the Illinois Natural History Survey. Information for this newsletter is gathered with the help of staff members, Extension field staff, and others. Karel Jacobs and Donna Danielson of The Morton Arboretum also provide information and articles.

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