
MUSHROOMS AND OTHER NUISANCE FUNGI IN LAWNS

Integrated Pest Management for Home Gardeners and Landscape Professionals

Mushrooms, sometimes called toadstools, are the visible reproductive (fruiting) structures of some types of fungi. Although the umbrella-shaped fruiting body is the most common and well known, mushrooms display a great variety of shapes, sizes, and colors. Some other fruiting bodies encountered in lawns include puffballs, stinkhorns, and bird's nests, descriptive names that reveal the diversity of forms among mushrooms. But regardless of shape, the purpose of all fruiting bodies is to house and then disseminate spores, the reproductive units of fungi.

Many fungi, including most that cause lawn diseases, have very small fruiting bodies that are hardly noticeable, and they don't produce typical mushrooms or obvious fruiting structures. Most fungi in lawns are beneficial, because they decompose organic matter, thereby releasing nutrients that are then available for plant growth.

This publication covers mushroom-producing fungi that are lawn management or nuisance problems but don't necessarily cause lawn diseases. Information on fungi and other pathogens that cause turfgrass diseases can be found in the University of California publications *UC IPM Pest Management Guidelines: Turfgrass* and *Pest Notes: Lawn Diseases—Prevention and Management* listed in References.

LIFE CYCLE

Fungal fruiting structures release tiny spores that are easily carried on air currents to new sites. When spores reach a favorable place to grow, they germinate and send out long thin

filaments called hyphae. Hyphae of some fungi decompose wood, fallen leaves, and other organic matter, absorbing a portion as food. Other fungi live in a beneficial association with plants, while others parasitize and cause diseases of plants. A single hypha is too small to be seen without magnification; however, in soil or beneath bark, groups of hyphae sometimes are visible as a mass of white or dark threadlike growth known as mycelium.

When mycelium has developed sufficiently, fruiting bodies such as mushrooms can be produced. Fungi generally survive in soil for years and produce fruiting structures only when conditions are favorable, such as after periods of prolonged wet weather.

IDENTIFICATION AND MANAGEMENT

Because mushrooms are merely the fruiting bodies of fungi, removing them doesn't kill the underground mycelia from which they are growing. Picking mushrooms, puffballs, stinkhorns, or other reproductive structures soon after they appear might prevent their spores from spreading to new sites. However, because most spores are windblown long distances, they can easily come into a lawn from neighboring areas. The primary reasons for removing mushrooms from lawns are to keep them away from children and pets and to improve a lawn's appearance.

Fairy Rings

Fairy ring fungi can cause circular or semicircular green bands of grass in a lawn (Figure 1). Rings can be 1 to 12 or



Figure 1. Fairy ring mushrooms around a circle of dark green turf.

more feet in diameter, and mushrooms might or might not be present. Fairy rings get their name from the ancient belief that mushrooms grew in circles where fairies danced. All grasses are susceptible to fairy rings, and several species of mushroom-producing fungi can be involved. Some common species that grow in fairy rings include *Marasmius oreades*, *Chlorophyllum molybdites*, and *Agaricus campestris*, among others.

Sometimes the only effect of the fungus is to stimulate grass growth in arcs or circles; this growth is caused by the release of plant nutrients as the fungal hyphae decompose organic matter in the soil. In other cases the soil just inside the ring can become so permeated by the fungal growth that water penetration is hindered and the grass in that area grows poorly or dies. Wherever there is bare soil, weeds and undesirable grasses can become established. Fairy rings often continue to enlarge for many years, and as the ring expands, the older portions of the fungus in the center die.

When the only effect of a fairy ring fungus is a ring of tall green grass, increasing fertilizer and irrigation in

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the surrounding lawn will usually mask these symptoms. If fairy ring has caused significant dying or dead areas of grass, lawn renovation might be required. If the grass isn't dead, it can reestablish itself if water penetration is improved by breaking up the dense fungal mat of mycelia. To improve penetration, remove cores of soil that are at least 1/4 to 1 inch in diameter and slightly deeper than the fungal mat.

Determine the depth of the fungal mat by probing the lawn area with a trowel, shovel, or long screwdriver. If the mat is fewer than 3 inches thick, using a lawn aerator a few times a year might be sufficient to improve water penetration. Begin 2 feet outside the margin of the ring and work inward. Sweep or rake up the cores and remove them from the turfgrass.

If the fungal mat is more than 3 inches thick, a lawn aerator might not be able to effectively remove infested soil cores of sufficient length. Also, lawn aerators might not be powerful enough to penetrate some soils. In these cases, a soil probe, small auger, or shovel might be needed to penetrate through and break up the fungal mat. Remove as much of the infested soil as possible and refill large holes with fresh soil that is relatively free of organic matter.

After treatment, water until the soil is thoroughly wet. Be sure to wash the coring implement before using it in healthy lawn areas. Dead areas in tall fescue or other bunch-type lawns might need to be reseeded. Creeping grasses such as bermudagrass will eventually fill in.

In general it is faster and more effective to manage fairy rings in the home lawn with the cultural practices mentioned above than with a fungicide. Fungicides containing azoxystrobin or flutolanil aren't readily available to the home gardener and require multiple applications and proper timing over a long period of time.

Where complete eradication is desired, remove the soil and sod to at least a

depth of 1 foot and 18 inches beyond the outside edge of the ring. Refill the trench with fresh soil and reseed the area. Be careful not to spill any infested soil on adjacent healthy areas.

Other Mushrooms

Mushrooms found in lawns often develop from buried scraps of construction lumber, dead tree roots, or other organic matter (Figure 2). The fungi that produce these mushrooms are beneficial, because they decompose organic matter in the soil, making nutrients available to other plants. These mushrooms are usually harmless to grasses, but some people consider them unsightly or want to get rid of them because young children play in the area. Remove mushrooms growing from buried wood or roots by picking the mushrooms as they appear or by digging out the wood.

Sometimes you can eliminate mushrooms growing from organic matter or hasten decomposition of organic matter by applying nitrogen fertilizer at a rate of 1 pound of actual nitrogen per 1,000 square feet of lawn. The nitrogen should be readily available and not a slow-release or water-insoluble formulation. Examples include 5 pounds of ammonium sulfate (21-0-0) or special lawn fertilizers such as 6 pounds of 16-6-8 or 4 pounds of 27-3-4 per 1,000 square feet of lawn. Fertilization hastens decomposition of organic matter.

Mushrooms in lawns are also commonly associated with overirrigation or poor drainage. Removing excess thatch and aerating the soil to improve water penetration in the lawn can help in some cases.

Inky caps. Inky caps, *Coprinus* species, are a common yet distinctive group of lawn mushrooms (Figure 3). They are so named because the cap of the mushroom decomposes into dark liquid resembling ink shortly after its appearance in the lawn (Figure 4).

Mycorrhizae. Some beneficial fungi, known as mycorrhizal fungi, connect themselves to tree, shrub, and herbaceous plant roots. These fungi



Figure 2. Mushrooms found in lawns often develop from buried scraps of construction lumber, dead tree roots, or other organic matter.



Figure 3. Newly emerged inky cap mushrooms, *Coprinus comatus*.



Figure 4. Maturing inky cap mushrooms, *Coprinus comatus*.

help plants absorb nutrients and water from the soil. The type of mycorrhizal fungi that grow in association with turf produce microscopic spores, while many mycorrhizal fungi of trees and some shrubs produce spore-bearing mushrooms. Hence, mushrooms produced by these fungi can sometimes

appear in lawns if their host is nearby. Many landscape trees—particularly oaks, pines, and other conifers—can't grow or might grow poorly without the help of these fungal partners.

***Armillaria mellea*.** This fungus often fruits from the base of a tree, from a tree stump, or in a lawn where a tree has been removed. It often produces clusters of honey-colored mushrooms in fall (Figure 5). Several hundred different trees and shrubs are attacked and killed by it. The mushrooms usually don't appear until the host tree is dead or in advanced stages of decline.

Mushrooms in newly laid sod.

Mushrooms often appear in a new sod lawn during sod establishment. Common species of mushroom include *Panaeolus foenisecii* (Figure 6), which are small with slender stems, brown gills and spores, and cone heads, and *Conocybe* (Figure 7), which are small and light-colored with slender stems and smooth cone-shaped caps. *Clitocybe* species (Figure 8) may also occur in new lawns. New sod lawns usually require frequent irrigations to become established, creating an ideal environment for the growth of mushrooms. The mushrooms don't harm the lawn and will disappear when irrigation is reduced.

Other Fungal Reproductive Structures in the Lawn

The following fungi don't cause real damage to a lawn but can be unsightly, foul-smelling, a concern for children and pets, or merely a curiosity. They aren't infectious or parasitic on lawns but live on decaying plant material.

Stinkhorns. Stinkhorn fungi produce a fruiting body that sticks up through the lawn; when mature, they resemble a giant finger or phallus (Figure 9). The tip of the stalk is covered by spores in a gooey slime that stinks. The terrible odor attracts flies and other insects, which pick up and spread the spores. Dig out or handpick the stinkhorns.

Puffballs. The fruiting body of puffball fungi is an enclosed ball (Figure 10) that opens, or ruptures, to release thousands



Figure 5. Clusters of *Armillaria* mushrooms.



Figure 6. Mushrooms of the common lawn fungus haymaker's *Panaeolus*, *Panaeolus foenisecii*.



Figure 7. Mushrooms of the common lawn fungus *Conocybe albipes*.



Figure 8. Mushrooms of the common lawn fungus *Clitocybe tarda*.

of spores when mature (Figure 11). In lawns, puffballs usually are an inch or less in size but can be larger. Most puffballs are creamy white on the inside and outside when young. At maturity the inside of the puffball is filled with dark-colored spores. This fungus doesn't



Figure 9. Stinkhorn mushroom, *Phallus impudicus*.



Figure 10. Fruiting bodies of a puffball fungus, *Vascellum* species.



Figure 11. Fruiting bodies of a poisonous hard-rind puffball fungus, *Scleroderma* species, with one cut open to show black spores within.



Figure 12. Fruiting bodies of the bird's nest fungus, *Nidula candida*.

require any management but may be removed to prevent children or pets from ingesting it.

Bird's nests. Bird's nest fungi produce fruiting bodies that resemble tiny nests with eggs (Figure 12). Though



Figure 13. Slime mold, *Fuligo septica*.

not eggs, these small spheres contain spores. Bird's nest fungi usually occur in groups that can be a few inches in diameter. This fungus doesn't typically require any management, as the fruiting bodies are small and don't normally attract pets or children. In any case, none is known to be toxic.

Slime molds. Slime molds aren't true fungi but primitive organisms that grow in similar environments. Although they sometimes occur in lawns, they are more common on mulch in landscaped areas. They form a gooey mass (plasmodium) that can look like vomit on the lawn surface (Figure 13). This substance can be various colors, but the common species, *Fuligo septica*, produces a yellow plasmodium that slowly moves across

the lawn, especially at night. The mold eventually dries on the lawn surface and produces dusty masses of spores. Undisturbed slime molds usually disappear in a week or so, but damage to the lawn underneath might result from shading and suffocation. Remove slime molds by raking, mowing, or spraying with a stream of water from a hose.

REFERENCES

Grebus, M. E., J. Hartin, F. Wong, and M. A. Harivandi. Sept. 2009. Diseases from *UC IPM Pest Management Guidelines: Turfgrass*. Oakland: Univ. Calif. Agric.

Nat. Res. Publ. 3365-T. Also available online at www.ipm.ucdavis.edu/PMG/selectnewpest.turfgrass.html.

Hartin, J. S., P. Geisel, and M. A. Harivandi. Sept. 2011. *Pest Notes: Lawn Diseases—Prevention and Management*. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 7497. Also available online at www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7497.html.

Moore, W. S., C. S. Koehler, and A. H. McCain. 1998. *Mushrooms in Lawn and Landscape*. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 21050. ♦

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CAUTION: SOME MUSHROOMS ARE POISONOUS

Do not eat wild mushrooms or other fungal fruiting bodies unless you are well acquainted with the different species. Many species are poisonous, and **ONLY** an expert can distinguish between edible and poisonous species. There are no simple tests that can be used to identify poisonous mushrooms.

Small children tend to put anything, including mushrooms, in their mouths, so remove all obvious fungal reproductive structures from the yard before allowing a child to play there. Pets also can be harmed by ingesting poisonous mushrooms and nuisance fungi.

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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