

Mushroom Compost Can Help Win the War Against Artillery Fungi

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Have you ever had little sticky spots of tar-like material on your house siding or sides of your car? If so, it's likely you have been bombarded by *Sphaerobolus*, also known as artillery fungus. In recent years, artillery fungi have exploded onto the landscape scene, splattering their difficult to remove spores everywhere. While artillery fungi are not hazardous in any way, they can create a tremendous amount of cosmetic damage to your home, car, or anything else in their immediate vicinity.

What Are Artillery Fungi?

There are many different kinds of fungi that live naturally in landscape mulch. For instance, mushrooms, slime molds, and stinkhorns are a just few fungi typically found in mulch. These fungi can be pesky, but no fungus is as aggravating to homeowners as artillery fungi. Artillery fungi can grow on most types of damp organic matter. They appear as very small cream or orange-brown colored caps containing many tiny black spores.

Artillery fungi love moist, rotting landscape mulch, preferably along the cool, north sides of houses. They are most abundant during unusually wet years, and they typically make their first appearances in the spring and fall. Artillery fungi grow rapidly throughout moist landscape mulch and produce sticky spore masses about the size of a pinhead.

They actively shoot these spores upward and outward like mortar cannons from the mulch (thus their name, "artillery" fungi). The fungi are, in a sense, genetically programmed to aim their sticky spore load towards the sun. However, they will aim towards reflective surfaces such as white house siding or the sides of light-colored automobiles as well. Once in place, the sticky spores dry, turn dark and tar-like and are nearly impossible to remove without leaving an unsightly brown stain on the surface. To make matters worse, artillery fungus spores remain viable for as many as ten years! This makes removal of the fungi even more difficult. Outbreaks can reoccur many years after homeowners address their initial artillery fungus problem.

Artillery fungus spores can permanently ruin the appearance of house siding. Unfortunately, many insurance companies don't cover "mold damage," which puts all the financial burden of replacing ruined siding on the homeowner. Because this spotting and staining on houses and cars is associated with mulch, many homeowners blame their mulch producers, suppliers and/or landscape contractors for the problem. Of course, no self-respecting mulch supplier or landscape contractor would knowingly expose a homeowner to the fungus. It's simply a matter of the fungus being pervasive, difficult to detect, and very hard to protect against.

Where Do Artillery Fungi Come From?

Artillery fungi are naturally occurring, widespread, wood-decay fungi and, as such, commonly occur on dead trees, dead branches, sawmill wastes, old wooden pallets and other pieces of wood that may end up being ground, shredded and used as landscape mulch. Thus, artillery fungi may be already in the mulch when the homeowner purchases it or when it arrives at a job site. It is also likely that artillery fungi spores may already exist at the job site on old mulch or decaying organic matter such as rabbit dung (a favorite), decaying leaves and grass, compost piles, etc. These existing spores may immediately infest clean, new applications of mulch when they are put down. In addition, fungal spores may be transported for short distances by the wind from nearby infested mulches or decaying organic matter.

People can also spread artillery fungi in various ways. Some homeowners make the mistake of sanding, scraping or otherwise removing the spores from the sides of their houses and letting the spores fall onto their mulch. These spores are dormant, but are very much alive and the fallen spores re-inoculate the mulch. Also, if a plant nursery has an artillery fungi problem, the spores may be shot up from the potting media and stuck to the underside of potted plant leaves. When these infested plants are planted at a new location and surrounded by new mulch, the infested leaves eventually fall off and the mulch is inoculated. There are almost endless ways the artillery fungi can end up in landscape mulch, making it very difficult to place the blame on the landscaper.

Because artillery fungi are so pervasive and easy to spread they are difficult to prevent or control. Recently, however, strong evidence has arisen that suggests that mushroom compost (MC), also called spent mushroom substrate (SMS), could be the answer to our artillery fungi problems.

What Is Mushroom Compost?

Mushroom Compost, is commonly sold in Pennsylvania as mushroom soil. It is the leftover material on which mushrooms are grown within mushroom growing facilities, so it's common in parts of Pennsylvania. In Pennsylvania alone, nearly 700,000 cubic yards of Mushroom Compost is produced each year as a byproduct of the mushroom industry, mainly in Chester County and southeastern Pennsylvania. Historically, this byproduct has been considered to be environmentally unfriendly and undesirable. Because of this, it has long been a disposal problem for mushroom growers.

Recent research at Penn State University has shown that Mushroom Compost has many beneficial uses, especially with regards to the nursery industry. Mushroom Compost may even act as an organic, biocontrol agent that suppresses various undesirable fungi in the landscape. A significant, environmentally friendly use for this compost would be to utilize it as landscape mulch or to blend it with existing mulches that are on the market.

The large mulch producers (i.e. in southeastern Pennsylvania) normally sell most of their mulch in the spring, which is the peak period of mulch sales and application. Then the huge mulch piles are built up again during the summer, during which time they are turned with bulldozers and allowed to compost. At this time, fresh mushroom compost could be trucked from mushroom houses to a mulch yard, blended with the landscape mulch and allowed to compost until the following spring when the blended product would be sold. This extended time period would also allow soluble salts, if any

were present, to be leached from the fresh mushroom compost. This use would solve a disposal problem for the mushroom industry, launch markets for use of the mushroom compost as a product, and likely decrease the incidence of artillery fungi and other undesirable fungi in the landscape.

Mushroom Compost Suppresses Artillery Fungus Growth

Recently, Penn State researchers conducted an experiment in which they established 27 different kinds of landscape mulch within 81 plots at their agricultural farm. Each plot was basically like a small stall, about 3 x 3 x 3 feet in width, depth and height. Each stall was open in the front with the two sides and back painted white, which acted as targets towards which the artillery fungi could aim. Mulch was placed in each plot to a depth of three to four inches and inoculated with artillery fungi spores. The artillery fungi were allowed to grow throughout the mulch for three years under natural, outdoor conditions. Each spring and fall, the numbers of spores that the artillery fungi had shot from each kind of mulch onto the white sides and back in each plot were counted.

To help interpret trends, the data from the 27 different mulches were grouped into nine general categories that had common characteristics: large yard pile mixtures of bark and wood, mulches blended with composted sewage biosolids or yard clippings, cedar mulch, mulches purchased as “bark” but containing considerable wood, dyed wood chips, non-dyed wood chips, cypress mulch, pure bark and 100 percent Mushroom Compost.

The amount of spores associated with artillery fungi growing on the different mulches differed significantly. Mulches that were shoveled from large, black, wet, compost piles supported significantly more fungal growth and spores than all the other mulches. At the other end of the spectrum, shredded cypress, large pine bark nuggets (not mini-nuggets), and 100 percent mushroom compost supported the least number of artillery fungi spores. The artillery fungi colonized both the dyed (colored) wood chips and non-dyed wood chips equally well.

Blends containing at least 20 to 40 percent Mushroom Compost are sufficient to suppress the growth of artillery fungi. In the future, the use of Mushroom Compost to prevent artillery fungus should become more pervasive as Mushroom Compost is very effective and inexpensive. In addition, mushroom producers will be able to turn the MC that was once an unfortunate, unwanted byproduct of mushroom production into a commodity.