Fumigation ABCs

Soil prep and conditions within the soil will determine how successfully you get rid of undesirable weeds, grasses, nematodes and insect pests with fumigation.

BY T. J. SWAFORD

Tractor-applied methyl bromide will prepare this fairway for sprigging of bermudagrass.

Fumigation is one of the tools in a superintendent's arsenal to eliminate competition in the turfgrass from weeds, weed seed, nematodes, disease, pests and any undesirable grasses.

Fumigation is generally labor-intensive but, in some cases, it may be the only way to control some weeds such as torpedograss or bermudagrass, or to be certain that contaminants have been cleared from a renovation location.

The ideal fumigant should provide effective control of the problem, have rapid toxic action, be low cost and easy to apply, and be effective to a depth of six to eight inches. With all of these attributes, it should also dissipate relatively quickly so the fumigated area can be regrassed.

Methyl bromide is a commonly used fumigant. Because it's a restricted use pesticide, it must be applied by experienced and licensed personnel. It will kill almost all organisms it contacts, although dosage varies according to target organisms.

When to fumigate

Fumigation is most effective when the soil temperature at the 2- to 4-inch depth is above 60°F. Soil temperatures must be within the range specified on the fumigant label as fumigants vaporize poorly and move slowly in cold soils, while evaporating too quickly from hot soils.

Soil texture can affect how well a fumigant can spread. The fumigant diffuses more rapidly in a loose, open-pored soil than a heavy or compacted soil. Soil moisture is also important. Fumigants will not diffuse

Methyl bromide faces phaseout

A year-old U.S. House proposal to delay the phaseout of methyl bromide has, so far, attracted 75 legislative cosponsors.

Methyl bromide is scheduled to be banned from use in the United States in less than three years. Reps. Dan Miller (R-Fla.) and Gary Condit (D-Calif.) in Oct. 1997 introduced H.R. 2609. If passed, it would delay the phaseout of the fumigant widely used in agriculture, structural pest control and turf.

In 1992, the Montreal Protocol listed methyl bromide as an ozone-depleting substance, causing Congress to apply provisions of the Clean Air Act to the chemical and forcing its early phaseout in the U.S. While use of the chemical in the United States is scheduled to end in 2001, other developed nations are not due for a full ban until 2005, and developing nations not until 2015.

H.R. 2609 would delay the phaseout of methyl bromide until all parties of the Montreal Protocol have agreed to and enacted a phaseout. Should a reasonable alternative to the chemical be found before the ban is implemented, then the U.S. EPA may begin again to phase out the chemical, regardless of the Montreal Protocol schedule.

Alternatives seeking niches

Several chemistries developed decades ago are gaining renewed interest as turf fumigants.

Basamid® Granular Soil Fumigant, manufactured by BASF, is one such product. BASF describes it as an "alternative to liquid and gas fumigants." Basamid (active ingredient, dazomet) is applied with a drop spreader, but like other fumigants it must be applied under certain conditions to be effective.

For instance, the soil must be in seedbed condition and free of clods to a depth of 6 inches. The soil must also be above 50° F for seven days, the duration of the treatment. During this time the soil must be watered (follow specific label directions) daily to activitate the product. Rolling and watering will also"seal" the treatment.

BASF claims that Basamid can streamline greens building when it's properly incorporated into the soil blending process prior to greens construction.

Telone II is a product that was used on thousands of acres of golf courses in South Carolina in the early 1980s, withdrawn from the market for additional testing and is returning to the marketplace. It's now registered for use on sod farms and agricultural areas in Florida and may become available to golf courses. The product is manufactured by Dow AgroSciences.

John Russell uses Telone II on existing turf against nematodes, mole crickets, white grubs.

John Russell, president of Soil Fumigants Co., Inc., Sanford, Fla., says that Telone II is injected into the soil by certified professionals with precision equipment that cuts slits into existing turf and deposits the product below the turf's rootzone.

"It does an excellent job against any subterranean insects, and a superb job on mole crickets and nematodes," he said.

well in very wet soils and may escape too quickly in very dry soils. For best results, soil should be moist to a depth of 6 inches at least one week before treatment. Maintain that moisture level until treatment. Fumigants should not be applied to dry soil.

Fumigation, the process

A mechanical application injects methyl bromide into the soil at a depth of 6 to 8 inches. The gas rate is determined by tractor speed and flow meter settings. Immediately behind the gas knives is a roll of 1-mil clear plastic fumigation tarp which is secured to the ground by channeling soil around a series of shovels, which actually 'tuck' the edges of the plastic into the soil. Each panel of plastic is joined together using an industrial adhesive.

The tarp is not actually impervious to the gases but it does reduce the dissipation rate of gases into the air, which both decreases hazards to workers and increases efficacy of the treatment.

The hot gas method is considered useful when treating smaller areas, areas with limited access and golf course renovation and construction where tractor damage would be considered unacceptable. This method requires the installation of a series of tubes and irrigation drip tape, approximately three feet apart, secured with sodding staple. A clear plastic 1.5-mil fumigation tarp is hand-rolled across the area to be treated .

The thicker plastic is easier to handle for installation and seam sealing. The seams are hand-glued, using an industrial adhesive and the edges of the tarp are sealed by piling sod or soils around the entire perimeter. Use a leaf blower to inflate the plastic just prior to fumigant application. The methyl bromide is circulated through a heating system similar to a radiator coil and is released through the drip tape. The desirable rate is determined by weighing the cylinder of gas prior to use, based on the square footage to be treated. The plastic must remain on the site for a minimum of 48 hours or until the gas conconcentrations are below 5 ppm before it is removed and disposed of properly.

This spot-fumigation, using the hot-gas method, was labor intensive, but targeted patches of off-type turf.

Fumigation rates vary from 0.75 to 1.8 lbs. per 100 ft^2. Renovations and problem areas of fairways are typically treated at slightly higher rates.

Follow the label carefully before attempting to reestablish turf. Don't attempt it before the label says so. But wait too long either. Otherwise, competitive contaminants have time to re-enter the area.

Once the tarps have been removed and the area allowed to breathe for the recommended time, it's time to seed, sprig, or sod. **LM**

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