

filaree, and morningglory are not effectively controlled with soil fumigants. Important considerations before choosing a particular soil fumigant include expense, soil moisture level, soil temperature, and time available before planting.

Several compounds are or have been used as fumigants. The two most used materials in turf are methyl bromide and metham or metam-sodium.

Methyl bromide. Methyl bromide is a colorless, nearly odorless liquid or gas. At 38°F, the liquid turns into a gas and at 68°F is 3.2 times heavier than air. These properties require a cover to be used with methyl bromide or the material will escape. Methyl bromide is extremely toxic (acute vapor toxicity is 200 ppm) due to a serious inhalation hazard and it is commonly combined with a warning agent such as chloropicrin (teargas) to warn the user of escapage.

When using this fumigant, the soil should be in a condition suitable for planting, including seedbed preparation by proper tilling. Normally, control is achieved only as deep as the soil is properly tilled. Soil should be moist for adequate soil fumigant penetration and dispersion. Saturated or extremely dry soils limit penetration and dispersion and subsequently affect weed seed absorption. Soil temperatures at four inches should be a minimum of 60°F. Fumigation is not effective if soil temperatures are below 50°F. Prior to or during application, the plastic or polyethylene cover should be placed with ends properly secured to prevent gas leakage. The treated area should be covered for 24 to 48 hours. The cover should then be removed and the soil aerated for 24 to 72 hours before planting.

Metham or metam-sodium. Metham (sodium methyl-dithiocarbamate) is a member of the thiocarbamate herbicide family. Metham is water-soluble, and upon contact with moist soil it breaks down to form the highly toxic and volatile chemical methyl isothiocyanate. Like methyl bromide, metham should be applied to moist soils with temperatures of at least 60°F. It is most effective when its vapors are confined with a cover; however, a water and soil-seal method may be used without a cover. With the water and soil-seal method, the soil is cultivated and kept moist for a week before treatment. The material is applied, rototilled, and watered-in immediately to the depth of desired control (approximately 4 to 6 inches). Approximately seven days after treatment, the area should be cultivated to help release any residual gases. One-to-two weeks later (two to three weeks after initial application), the treated area may be planted. The longer waiting period before planting, and the lowered effectiveness without a cover, are drawbacks to metham and should be considered before use. The oral LD₅₀ of metham is 820 mg/kg while the dermal LD₅₀ is 2000 mg/kg.

Dazomet. Dazomet recently has been introduced as a soil fumigant. Unlike methyl bromide and metham, dazomet is a granular product and is not a restricted use product. Being a granular, dazomet must be evenly applied and incorporated for maximum effectiveness. Its breakdown characteristics, application preparation, and effectiveness are closely associated to metham, as well as its advantages and disadvantages.