PROPOZONE SOIL FUMIGANT 2004

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PROPOZONE, 100% propylene oxide, research as a soil fumigant has continued over the past year in many new tests and continues to show that it can safely replace Methyl Bromide. Propylene oxide is unique in that it is an all purpose fumigant that has been used for over 40 years as an "insecticidal fumigant in stored products insects and to reduce bacterial and mold contamination" in food. Soil laboratories have used propylene oxide for over 50 years to "sterilize". soil. It's properties are generally well known.

The results below have been accumulated over the past 4 years and show PROPOZONE effective against all known soil pathogens such as nematodes, weeds (nutsedge etc) and fungal pathogens. Shank injection is the preferred application method particularly in very warm climates and for treating deep nematodes. Either application through drip tapes or shank injection work well against weeds and fungal plant disease.

Results equal to or better than Methyl Bromide

D = Drip Application Tested S = Shank

Pathogen List			Crop List		
Fungal	45-60 gal/A	D or S	Caladium	45 gal/A	D or S
Nematodes	45-60 gal/A	D or S	Egg Plants	45-60 gal/A	S
Weeds including nutsedge	60-80 gal/A	D or S	Gladiolas	45 gal/A	S
			Peppers	45-60 gal/A	S
			Strawberries	30-60 gal/A	D or S
			Tomatoes	45-60 gal/A	D or S
			Cantaloupes	45 gal/A	S

The 2004 soil tests reported at this writing begin to give a clearer insight into the parameters for using PROPOZONE, especially relating to dose, plant back time and temperature. Because of its relatively low boiling point of 95 F, PROPOZONE tends to offgas quickly from warm soil after application so that within 14 –21 days phytotoxicity of the plants are eliminated.

In cooler climates, such as along the coast of California or in Michigan, PROPOZONE evaporation is reduced so that offgasing is slower resulting in considerable damage to plants when using high doses such as 80 gallons per acre or above even with plant back intervals of 21 days. When this happens the first thing noticed is the complete elimination of all weeds, then weak plants and possibly the overgrowth of other pathogens such as Phytothpora capsici that have nothing inhibiting it. This occurred in our 2004 tests in cooler than usual Michigan with Cantaloupe and Squash tests using 80 gallons/A with a plant back interval of 21 days. Whereas in warm Alabama soils 45 - 80 gallons per acres controlled weeds and root gall nematodes in Cantaloupes better than MB/Pic with no damage to plants with a 21 day plant back.

Next we hope to analyze the effect of various soils on dose and application methods. It seems that to kill nematodes the shank application is best for most soils but drip works wells in sandy soils where the drip water penetrates deeply. Weeds with surface roots appear to be drip treated satisfactorily. Tests using a mixture of 70% PROPOZONE with 30% water are planned to determine if the increased liquid volume will spread PROPOZONE further both to the side and deeper to more effectively kill pathogens with a lower dose.

Meylan* reports that the reaction of 100% propylene oxide (PROPOZONE) with ground water to form the food additive propylene glycol occurs with a half life of 7-12.9 days at pH 5-9 at 25 C. Although the conversion of PROPOZONE to the glycol will be somewhat slower at ground water temperatures, it assures that there will be no harmful residues to contaminate family wells.

We are pleased to report that again this year applicators like working with PROPOZONE because it is none corroding to pipes and cylinders, has a pleasant noticeable odor and low toxicity. This latter property may orient the marketing of this product to restricted areas near homes and schools where inhalation exposure and groundwater contamination is important.

*CHEMICAL OF CURRENT INTEREST PROPYLENE OXIDE: HEALTH AND ENVIRONMENTAL EFFECTS PROFILE, Toxicology and Industrial Health . Vol. 3, 1986 W. Meylan et al for U.S. EPA