VERSATILE PROPOZONE*
(100% Propylene Oxide)
Morris Warren, ABERCO Inc.

Our attention this past year has been mainly to confirm the results we have previously obtained by work done over the past 5 years to prove that propylene oxide would make an excellent replacement for methyl bromide used for preplant soil treatment. However, I would be remiss if I didn't tell you that propylene oxide is now used extensively by the nut industry for post harvest applications, particularly to treat almonds that have had massive recalls over the past 4 years due to Salmonella infections. The liability of these recalls have prompted the whole nut industry to review their quality control and some firms even have made it a policy to treat all their nuts with propylene oxide to insure against making their customers ill and subjecting themselves to massive law suits.

I am pleased to report that EPA registered a new product containing 8% propylene oxide and 92% carbon dioxide as a methyl bromide alternative for nutmeats, in-shell nuts and spices. We call it PROPOXEDE * 892. This product is a true methyl bromide alternative and is welcomed by the nut and spice industries.

One soil test this year was to confirm again the excellent results obtained by the low dose used in the preplant treatment for strawberries in California by Driscoll. Again it gave results better than methyl bromide. This work is very important to us as we want to move forward with a registration focused primarily for use in fields without setback restrictions. Tests in the mountains of North Carolina to prepare soil for melons and tomatoes were also successful at a dose of 45 gallons/acre. Pictures and results will be presented at the symposium.

Further south in Bradenton, Florida, Dr. Jim Gilreath's work for the third year in a row continues to show that propylene oxide was highly effective against nutsedge and without any additional herbicide. Although 80 gallons per acre were required to control nutsedge, the higher costs of this dose were offset by the elimination of additional herbicidal treatments that is common under these conditions. Controls of most weeds, nematodes and soilborne diseases can be obtained at rates much lower than the 80 gallon per acre rate used in Dr. Gilreath's trials for nutsedge. Data from Dr. Gilreath's 2005 results will be presented at the symposium

Tests at Dr. Lopez-Aranda's greenhouses in Spain will also be presented at the symposium with positive early reports against nematodes and fungal pathogens.

I would like to concentrate this part of my talk on the use of propylene oxide where nematodes are the primary pathogen.

First lets look at the propylene oxide physical properties and see how these must fit into the mode of application, soil types and weather conditions.

1) Propylene oxide is a volatile liquid that boils at 94 F, is soluble in water with which it can slowly react (4-5 day half life) to form non toxic propylene glycol.

2) It is volatile particularly as temperatures approach its boiling point, but at room temperature or below it is quite stable, evaporating slowly or not at all..

Application may be either by drip or shank but we feel that deep shank application of about 10-12 inches deep provides a deadly barrier that kills nematodes while the volatility allows the vapors to gradually seep upwards effectively killing any nematodes that happen to be present above the level of application. Shank application appears better when dealing with more compact soils with higher clay content. The noticeable propylene oxide odor has never been reported after application.

Drip application appears easiest and maybe best when dealing with light sandy soils, particularly if other pathogens such as weeds are a problem. The water can carry PROPOZONE deep enough to reach the nematodes but also kill weed seeds that may be present nearer the surface.

Both soil and air temperature influence PROPOZONE because of its volatility. Cooler climates retard evaporation or conversion to the glycol, which allows the product to remain longer in contact with the pathogens. This increases the kill but does not allow the concentration to dissipate quickly necessitating longer replant times. We find that for heavy doses and cold weather, replant times of 21 days are needed to prevent stunting of the crop. Usually a 14 day replant works fine for most doses in warm weather.

In summary PROPOZONE is a very versatile soil fumigant that works well in all situations when appropriately applied. Its low toxicity and conversion to non toxic propylene glycol in ground water makes it an environmentalist's dream However, we feel that in reality the farmer is going to teach us how to use it as they did with methyl bromide.

* ABERCO registered trademark