METHYL BROMIDE RATE REDUCTION AND MULCH EFFECT ON NUTSEDGE CONTROL

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In Florida and most subtropical or tropical countries, nutsedge (*Cyperus* spp.) is a major weed problem in mulched vegetable production. As methyl bromide (MBr) is phased out alternatives are essential for growers. However because of critical use exemptions growers will still be able to use restricted amounts of MBr. Therefore, using mulches like virtually impermeable film (VIF), that can reduce fumigant loss, may allow rate reduction without compromising efficacy.

Metallized mulch has been shown to be an efficient repellent for certain insects and also to improve crop yields. Using this mulch can be part of an integrated pest management program that allows a reduction of insecticide use. The objective of this experiment was to assess metallized mulch properties for fumigant retention and nutsedge control, compared to high density polyethylene (HDPE) mulch and VIF.

Two field studies were conducted in spring 2005, in Ruskin, Fla., USA. Metallized, HDPE mulches, and VIF were combined with the following rates of MBr + chloropicrin (Pic) (67/33, w/w): 0, 99, 196, 294, and 392 kg/ha. Methyl bromide retention was evaluated in samples of soil air at 2, 4, 6, and 8 days after treatment (DAT) and 3, 5, 7, and 10 DAT, in trial 1 and 2, respectively. Nutsedge plants were counted at 3, 5, 7, and 10 weeks after treatment (WAT) and 2, 5, and 8 WAT, in trial 1 and 2, respectively. Data were analyzed with a regression procedure to establish the relationship between the rate and MBr concentration and nutsedge densities.

In both trials, VIF and metallized mulch had higher MBr concentrations in the soil than HDPE. However, differences between VIF and metallized mulch were not consistent throughout the two trials. In trial 1 at 8 DAT, metallized mulch with 99 kg/ha had 654 ppm of MBr; whereas VIF and HDPE mulch with 392 kg/ha had 448 and 33 ppm, respectively. In trial 2 VIF retained 30% and 35% more MBr than metallized for 294 and 392 kg/ha.

Increasing fumigant rates improved nutsedge control for each mulch. Nutsedges were controlled the best with metallized mulch regardless of the rate. In trial 2 at 10 WAT, metallized mulch with 99 kg/ha of MBr had 4 nutsedges/m^2 compared

to 63 with VIF and 89 with HDPE. These findings demonstrate that metallized and VIF mulches can provide effective control of nutsedge with reduced rates of MBr.