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Presentation summary

METHYL BROMIDE FUMIGATION ALTERNATIVES FOR
SWEETPOTATO HOTBEDS IN CALIFORNIA

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Sweetpotatoes are a 9-month crop, where the production system can be split into two distinct components: hotbeds and field production. Sweetpotato hotbeds are the nursery area that growers use to grow transplants for field production. Typically, the hotbed season begins in February, when seed potatoes (small potatoes that are not sold for the market) are placed into beds to grow plants that will later be transplanted into the production fields.

The main reasons for fumigating hotbeds (in order of importance):

1. Weed and disease control.
2. Nematode and insect control.

Hotbeds are commonly fumigated in the late fall with a MeBr + Pic combination, tarped with standard plastic. Currently, MeBr is allowed under a Critical Use Exemption (CUE) with the U.S. Environmental Protection Agency, however, this is unlikely to continue indefinitely. Products containing Telone and chloropicrin are a strategic part of the methyl bromide alternatives strategy for this industry. The most common replacement would be Telone (1,3-D) + Pic, however Telone has numerous regulatory restrictions because it cannot be applied in December or January (Merced County Agriculture Commissioner permit conditions, 2006) and is subject to use caps that renew at the beginning of each year. Most hotbeds are located in Townships severely impacted by caps.

Growers have commented that without fumigation, production declines. However, there has been almost no research investigating fumigant effects in sweetpotato hotbeds on plant production or the subsequent effects in the field (most research has taken place in production fields, not hotbeds). A small trial performed in 2006 in Merced County, CA, showed that chloropicrin did not provide satisfactory weed control unless combined with Telone. Further fumigation research is needed, especially on the impacts of multiple years without fumigation and the corresponding buildup of disease and/or nematodes.

Beginning in the summer of 2007, a project has been approved by the USDA ARS Pacific Area Wide Pest Management Program for Integrated Methyl Bromide Alternatives with the objective of evaluating alternatives to MeBr for sweetpotato hotbeds that are agronomically acceptable and also meet regulatory approval. The project has the following treatments:

1. Untreated control.
2. MeBr + pic, shanked at 350 lbs/A and tarped in late fall (57% MeBr/43% Pic, grower standard).
3. Telone + pic (Pic-Chlor 60 at 525 lbs/A), shanked and tarped.
4. Vapam (metam sodium) flood applied at 75 gpa.
5. Pic alone (315 lbs/A, shanked and tarped).
6. Flat solarization (apply in summer), no bed trench, no gin trash.

As of September 1, all treatments but #4 (Vapam) had been applied with a commercial sweetpotato grower in the Atwater, CA, area. The solarization treatment was set out on June 27 and reapplied August 20 because of problems with the plastic.

In addition to the main fumigant treatments outlined above, the trial also proposes splitting the main plots at bedding to compare chemical and variety combinations that may be viable alternatives to straight chemical fumigation (*e.g.* Pic only combined with a herbicide for weed control). Two fungicides (Botran, Mertect), herbicides (Devrinol, Valor), and varieties (Beauregard, Golden Sweet) will be compared.

Variables to be measured include nematode counts, *Pythium sp* quantification in the soil, weed control, plant stand production, disease incidence if present, and effects on field production.



Solarization treatments being applied June, 2007.