Efficacy of Nematicides and Soil Fumigants on Field Production of Sweetpotatoes in California

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Introduction

Preplant soil fumigation is used on sweetpotatoes in California to suppress mainly root knot nematodes (RKN), *Meloidogyne incognita*, and soil insects such as wireworms (*Limonius spp*) and grubs (*Diabrotica spp, Phyllophaga spp*). These pests can reduce yield and quality of the harvested roots.

Telone (1,3-D) is the preferred fumigant, however, it's use is limited by state-mandated "use caps" to 92,500 lbs a.i. per township. In certain high use areas, this limits use to 17% - 50% of demand depending on location within the production area.

Reduced rates of Telone, different products, fumigation blends and new nematicides offer potential alternatives.

The objective of these research trials were to evaluate the effect of pre-plant applications of fumigants and nematicides on yield and quality of sweetpotatoes.

Root knot nematode can cause severe cracking in susceptible

Methods

- Trials in 2009 -10 and 2014 – 16 in commercial fields in Merced County, CA.
- Telone at 6, 9, 12 gpa with and without chloropicrin.
- Metam potassium at 35 and 50 gpa.
- Nimitz (fluensulfone) nematicide at 3.5 and 5.0 pints/A.
- RCBD with 4 replications, all materials applied pre-plant and incorporated, plot size ~ 22 ft x 150 ft.
- Nematode samples taken at harvest; yield data and root quality were measured from the center bed of each plot.

Telone applications were shanked into moist soil at 18" depth and 18" centers, then sealed with a ring roller.

Metam applications were shanked into moist soil at 3", 6", and 9" deep on 9" centers, then sealed with a ring roller.

Results

Regardless of treatment, location, or year, RKN counts in the soil in the spring and fall were highly variable (Figs 1 & 3).

Telone has consistently increased yield – on average **167% as compared to untreated plots over a 3-yr period (Figs 2 & 3).** Low rates of Telone (6 – 9 gpa) performed better when combined with metam.

Nimitz trials have shown significantly increased yield in 3 of 4 site-years (Fig. 3). However, insect damage has been significant and equivalent as the the untreated plots.

Telone alternatives can be very effective provided they are applied correctly. Exclusive use of nematicides will likely require concurrent use of insecticides.

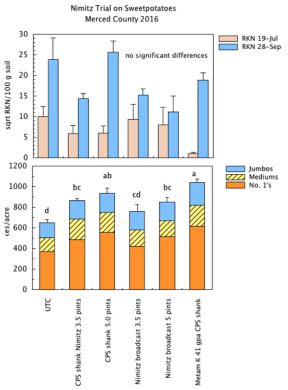

Figure 3 (above). RKN counts and yield as affected by Nimitz nematicide and metam fumigation treatments.

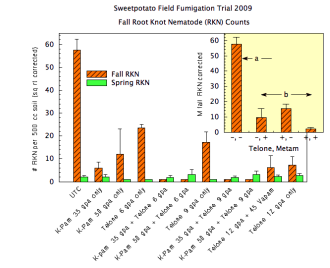

Figure 1. RKN counts at the 2009 location.

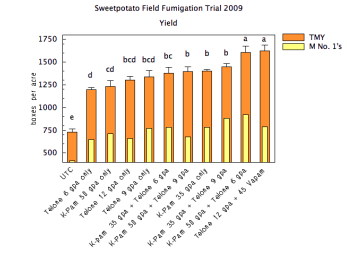

Figure 2. Root yields significantly increased in all treatments as compared to untreated control.

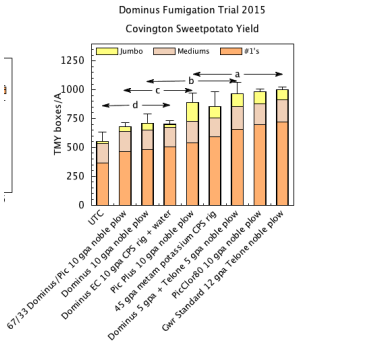

Figure 4. Root yield as affected Telone and alternative fumigation combinations..

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