EFFICACY OF METHYL BROMIDE ALTERNATIVES FOR WEED AND VERTICILLIUM MANAGEMENT IN TOMATOES

F. J. Louws[1], R. M. Welker[1], J. Driver[1], K. Jennings[2], and D.W. Monks[2].
Departments of [1]Plant Pathology and [2]Horticulture, North Carolina State Univ., Raleigh NC 27695

Introduction: Tomato production is an important source of income for many farms in North Carolina and the adjacent Southeastern States (GA, SC, TN, and VA), accounting for $150 million in farm gate income. In the case of the mountain production region (e.g. Western NC) Verticillium wilt (VW, especially race2) and weed management are key target pests that must be managed for optimum yields. In this report we highlight recent research to integrate efficacious management of both VW and weeds in Western North Carolina.

Materials and Methods: This trial examined several methyl bromide alternatives and emphasized chloropicrin combined with various herbicides as compared to T-C35 and MB. The experiment was conducted at the Mountain Horticultural Crops Research Station, Fletcher, NC (Latitude: 35.43°**;** Longitude: -82.56°; Elevation: 2069 feet above sea level). Treatments were arranged in a randomized complete block design with four replications in each trial. NC recommendations for fresh market tomato production were used. All treatments were applied 25 May to 1 Jun (see Tables). Plots comprised a single 6-in. raised bed 100 ft long and 24-in. wide and beds were spaced on 5 ft centers. Tomatoes were transplanted by hand on 22 Jun with a final stand of 12 plants per plot. Plots were rated weekly for 5 weeks for weed pressure beginning after transplanting. The number of holes containing weeds was counted, as well as the number of holes containing grass and the number containing broadleaf species. Crop height and tomato yield data were also collected.

Beds in all plots were preformed and infested with weed seeds (pigweed seeds). Herbicide treatments were then made with a boom sprayer, and then fumigants were immediately applied as outlined in Table 1. In the case of the Vapam, beds were preformed, then spayed with Vapam and immediately roto-tilled to ensure complete distribution of the product throughout the bed profile. A second pass pulled the plastic and drip tape. In the case of sodium azide (SEP 100), and drip applied Vapam, chemicals were injected using 2 drip tapes per bed.

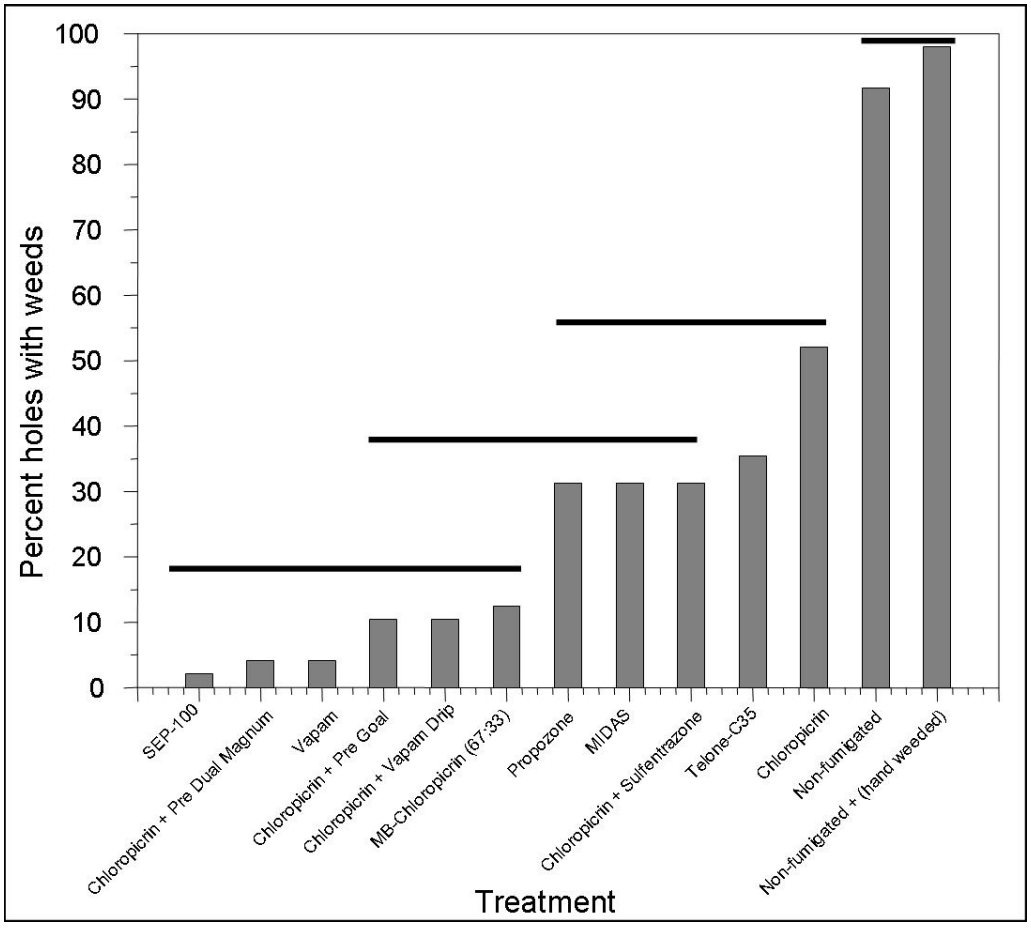
TABLE 1: Treatments included in the tomato experiment

	Treatment (broadcast rate)	Application dates
1	Non Fumigated	NA
2	Non Fumigated (hand Weeded)	NA
3	MB 67:33 (400 lb/A)	25-May
4	Telone C35 (35 gal/A)	25-May
5	SEP-100 (sodium azide) (75 lb a.i./A)	25-May
6	Propozone (60 gal/A)	25-May
7	MIDAS (240 lbs/A)	25-May
8	Chloropicrin (150 lb/A)	25-May
9	Chloropicrin (150 lb/A) + Vapam Drip (75 gal/A)	25-May / 1-Jun
10	Chloropicrin (150 lb/A) + Sulfentrazone	25-May
11	Chloropicrin (150 lb/A) + Pre Dual Magnum 1.0 pt/A	25-May
12	Chloropicrin (150 lb/A) + Pre Goal 1.0 pt/A	25-May
13	Vapam (Broadcast - 75 gal/A)	25-May

Results: Fumigant treatments dramatically impacted weed density (Figure 1). Chloropicrin alone offered slight weed control compared to non-fumigated plots. All fumigants and fumigants plus herbicides offered weed control similar to the MB:Pic standard. Pre-plant treatments with Sulfentrazone, Dual Magnum, or Goal reduced weed density populations to those similar to the methyl bromide treatment. Vapam applied alone prior to laying the plastic, or applied as a drip application 1 week after chloropicrin fumigation offered similar control compared to the herbicide treatments. Telone-C35 also offered intermediate control of the summer annual weeds present. This site did not have nutsedge pressure. Post-emergent herbicides were not needed and therefore not applied.

Treatments also had an effect on total yield (yield data was incomplete at the time of publication but should be highly indicative of expected final results). Vapam (incorporated), Midas and Telone C-35 all had superior yields similar to the methyl bromide standard. Phytotoxicity occurred immediately after transplanting in the sodium azide treated plots.

Figure 1: Weed density as impacted by fumigant and herbicide (and just prior to hand weeding).



.

FIGURE 2: Marketable yield as impacted by fumigant and herbicide.