EFFICACY OF TWO FORMULATIONS OF MIDAS FOR STRAWBERRY PRODUCTION

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Iodomethane (IM) is a broad-spectrum soil fumigant and can be a drop-in replacement to methyl bromide soil fumigant. Our early research evaluated several formulations of IM plus chloropicrin (Pic) for strawberry production in California and found that shank application of Midas-50 (50% IM plus 50% Pic) or drip application of Midas-33 (33% IM plus 67% Pic) at 300 lbs/A under standard high density polyethylene (HDPE) tarp had equivalent efficacy to standard MB/Pic (67/33) at 350 lbs/A. The objective of the current study was to evaluate weed control and strawberry yield under reduced rates of Midas-33 and Midas-50 applied to soil beds by shank injection or drip fumigation under virtually permeable film (VIF).

Methods

Two studies were conducted in Watsonville and Salinas, CA. The Watsonville studies were initiated on October 10, 2005, at the Monterey Bay Academy (**MBA**) research facilities. The Salinas studies were initiated on October 29, 2005, at the USDA-ARS research facilities (**Spence** farm). Fumigant treatments included untreated control, Midas (33:67 and 50:50) shank injected and drip applied at 200 lb/A, and MB/Pic (67:33) at 300 lb/A. In all experiments, beds were covered with clear VIF. Treatments were replicated four times and plots were 33 or 43 feet long and 54 inches center-to-center. Seed bags containing 35 seeds of the following weeds: little mallow, common purslane, common chickweed and knotweed were installed at the bed center and edge at 2 and 6" depth prior to the fumigation. Seed bags were retrieved one week after fumigation and seed viability was determined by species with TZ test. Resident weed biomass was also determined. Strawberry plants (Diamante) were transplanted approximately four weeks after fumigation. Strawberry fruit was harvested weekly and sorted into marketable and culls.

Results

All fumigant treatments provided excellent control of the resident weeds (except for little mallow at MBA) (Table 1). Also, the control of weed seed in buried bags was similar for Midas and MB/Pic, but both had poor control of little mallow seed (Table 2).

At both locations, fumigated plots had significantly higher total and marketable yield than the untreated control (Figures 1 and 2). Midas treatments were not significantly different the MB/Pic treatment.

Table 1: Accumulated weed densities of little mallow, annual bluegrass, and the total weed density at MBA and Spence farm.

Fumigant	Application method	Rate	MBA			Spence Farm	
			Little mallow	Annual bluegrass	Total weed	Annual bluegrass	Total weed
		lbs/A	---------- number / acre ----------				
Untreated	-----	-----	1509	51935 a	106636 a	6679 a	62273 a
Midas 50	Drip	200	503	0 b	4527 b	-----	-----
Midas 33	Drip	200	503	0 b	9054 b	176 b	8013 b
Midas 50	Bed Shank	200	2767	0 b	6665 b	421 b	13174 b
Midas 33	Bed Shank	200	2137	503 b	6665 b	546 b	8032 b
MbPic	Drip	300	1006	1006 b	6916 b	117 b	10060 b
ANOVA							
P-value			ns	<0.001	<0.001	0.001	<0.001

Table 2: Survival of weed seeds in buried seed bags installed prior to the soil fumigation at MBA and Spence Farm.

Fumigant and application method	Rate	MBA				Spence Farm			
		Little mallow	Common purslane	common chickwd	Knot-weed	little mallow	Common purslane	Common chickwd	Knot-weed
	lbs/A	---------- Percept of viable seed (%) ----------							
Untreated		80.5 a	95.8 a	77.7 a	91.5 a	74.8 a	97.4 a	82.7 a	99.0 a
Midas 50 drip	200	64.6 b	0.0 b	0.0 b	0.0 b	----	----	----	----
Midas 33 drip	200	58.9 bc	2.1 b	0.0 b	0.5 b	52.6 b	1.6 b	0.0 b	0.0 b
Midas 50 shank	200	58.0 bc	0.0 b	0.0 b	0.0 b	53.0 b	0.0 b	0.0 b	0.0 b
Midas 33 shank	200	56.7 c	7.7 b	0.0 b	0.0 b	54.9 b	0.0 b	0.0 b	0.0 b
MbPic 67:33	300	66.0 bc	0.6 b	0.8 b	12.8 b	56.2 b	0.0 b	0.0 b	3.2 b
ANOVA									
P-value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

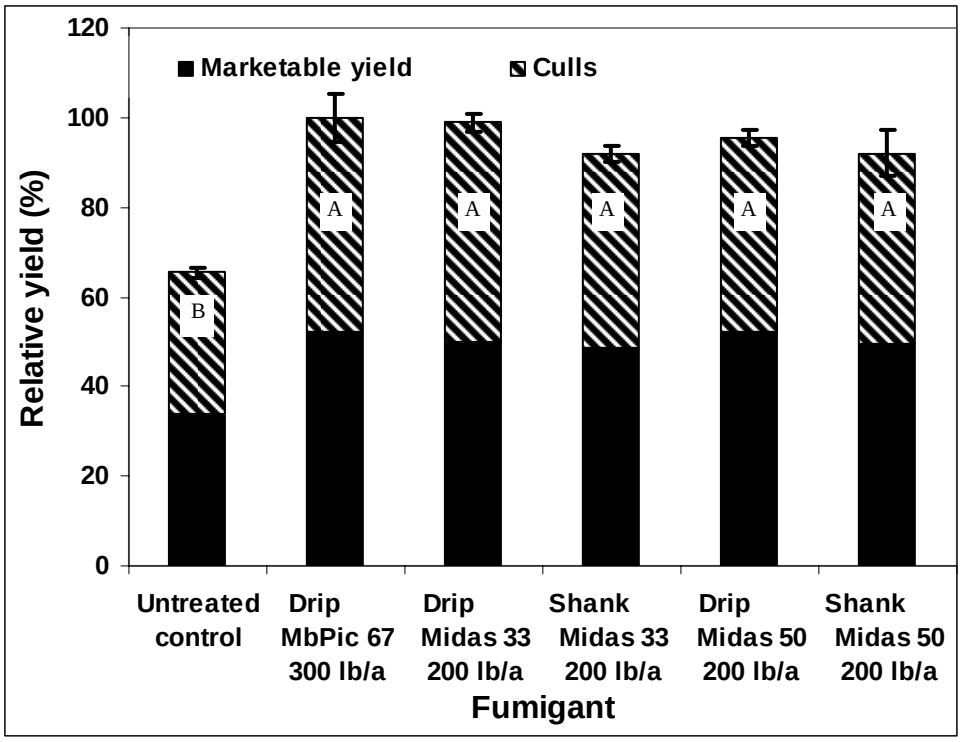

Figure 1: Relative yields to plots fumigated with MbPic at 300 lb/a at MBA. Total yield through August 11, 2006, for the MbPic treatment was 40,747 lbs/A.

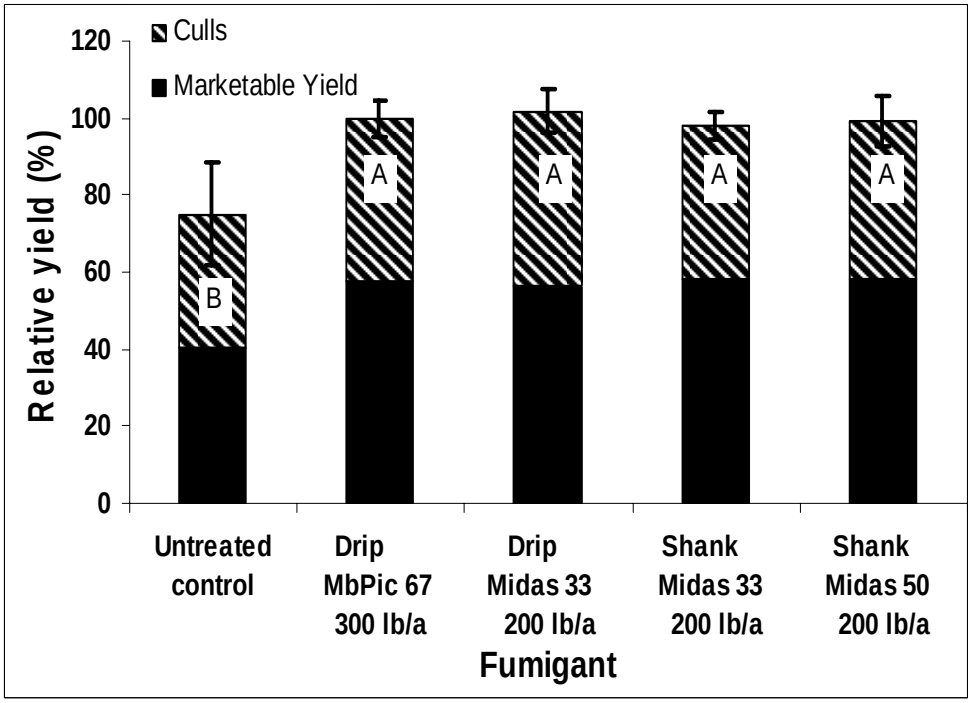

Figure 2: Relative yields to plots fumigated with MbPic at 200 lb/a at Spence. Total yield through August 9, 2006, for the MbPic treatment was 26,840 lbs/A.