STRAWBERRY YIELD WITH CHLOROPICRIN AND INLINE IN COMBINATION WITH METAM SODIUM AND VIF

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Previous research has shown that sequential application of metam sodium after reduced rates of InLine or chloropicrin (Pic) controlled soil pests and produced strawberry yields equivalent to standard methyl bromide/chloropicrin fumigation. Also, studies have shown that the application of fumigants under Virtually Impermeable Films (VIF) can enhance weed and pathogen control. The objective of our research was to determine minimum effective application rates of Pic and InLine applied under VIF and in combination with metam sodium.

Methods

Research and demonstration studies were conducted in commercial strawberry fields in California (Oxnard, Santa Maria, and Watsonville) during the 2002-03 and 2003-04 productions seasons. In the research trials, Pic and Inline were drip applied at five rates (50, 100, 200, 300 and 400 lbs/ac) under VIF and standard polyethylene mulch. In the demonstration trails, drip-applied Pic (200 lbs/ac), InLine (300 lbs/ac), or Midas (200 lbs/ac) were followed with a sequential application of metam sodium (35 gal/ac of Vapam HL) seven days later. Fumigants were applied in 1.5 inches of water. Methyl bromide/chloropicrin (MBPic) was shank-injected at 350 lb/ac. Strawberry was planted at least four weeks after fumigation. Strawberry fruit was harvested by commercial crews and separated into marketable quality and culls.

Summary of Results

Strawberry yield data relative to MB/Pic in the research trials at Oxnard and Watsonville are listed in Tables 1 and 2. Pathogen pressure in both locations was severe. Yield relative to MB/Pic in the untreated control was 72% in Oxnard and 80% in Watsonville. In both locations, the use of VIF compared to standard mulch increased the yields for most treatments. However, no significant differences (at P=0.05) were found among the chemical treatments.

The demonstration trials confirmed earlier research that metam sodium can be used to reduce application rates of InLine and Pic without a loss in yield. Application of metam sodium after Pic (200 lbs/ac), InLine (300 lbs/ac), or Midas (200 lbs/ac) increased strawberry yield by 5 to 10% compared to the same treatments without the sequential metam sodium application.

Table 1: Strawberry total fruit yields relative to MB/Pic (300 lbs/ac) from an Oxnard soil treated with Pic and InLine under VIF and standard mulch.

Fumigant	Dose lbs/ac	% yield under standard PE	% yield under VIF[1]
1. Chloropicrin	50	90	98
2. Chloropicrin	100	103	102
3. Chloropicrin	200	96	100
4. Chloropicrin	300	100	109
5. Chloropicrin	400	102	111
6. 1,3-D + chloropicrin	50	89	91
7. 1,3-D + chloropicrin	100	87	97
8. 1,3-D + chloropicrin	200	99	97
9. 1,3-D + chloropicrin	300	99	109
10. 1,3-D + chloropicrin	400	102	111
23. Untreated	0	72	81
24. MB +Pic	300	100	108

[1] Chemical treatments were not significantly different (at P=0.05) from each other.

Table 2: Strawberry total fruit yields relative to MB/Pic (350 lbs/ac) from a Watsonville soil treated with Pic and InLine under VIF and standard mulch.

Fumigant	Dose lbs/ac	% yield under standard PE	% yield under VIF[1]
1. Chloropicrin	50	86	104
2. Chloropicrin	100	95	110
3. Chloropicrin	200	100	104
4. Chloropicrin	300	106	100
5. Chloropicrin	400	100	106
6. 1,3-D + chloropicrin	50	85	91
7. 1,3-D + chloropicrin	100	90	110
8. 1,3-D + chloropicrin	200	92	103
9. 1,3-D + chloropicrin	300	94	113
10. 1,3-D + chloropicrin	400	109	109
23. Untreated	0	80	80
24. MB +Pic	350	100	96

[1] Chemical treatments were not significantly different (at P=0.05) from each other.