STRAWBERRY YIELD WITH VARIOUS RATES OF CHLOROPICRIN AND INLINE APPLIED UNDER VIF

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Use of virtually impermeable films (VIF) rather than a standard polyethylene (PE) tarp will reduce fumigant emissions to the atmosphere and can improve fumigant performance significantly. Most PE tarps used in agriculture are highly permeable to fumigants. The VIF exhibits a very low permeability to gas efflux. The objective of this research was to evaluate strawberry yield after drip fumigation with various rates of Chloropicrin (Pic) and InLine applied alone and in combination with metam sodium under VIF and standard polyethylene mulch.

Methods

Research and demonstration trials were conducted in commercial strawberry fields in California (Oxnard, Santa Maria, and Watsonville) between the 2002 and 2005 production 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 trials, drip-applied Pic (200 lbs/ac), InLine (300 lbs/ac), or Midas (200 lbs/ac) were followed by a sequential application of metam sodium (45 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 all locations was severe. The use of VIF compared to standard mulch increased the yields for most treatments. Logistic analyses suggest that 382 lbs/ac of InLine or 294 lbs/ac of Pic applied under standard tarp are needed to produce equivalent yields to MP/Pic (350 lb/ac under standard tarp). Under VIF, only 310 lbs/ac of InLine and 198 lbs/ac of Pic are needed to produce yields equivalent to the standard MP/Pic (350 lb/ac under standard tarp).

The demonstration trials confirmed previous research that metam sodium can be used to supplement reduced rates of InLine, Pic, and Midas without a loss in yield. Application of metam sodium or metam potassium 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 application.

Table 1. Average strawberry marketable yields relative to MB/Pic from Watsonville soils treated with Pic and InLine under VIF and standard mulch.

Fumigant	Rate lbs/ac	% yield under standard PE	% yield under VIF
1. Chloropicrin	50	92	96
2. Chloropicrin	100	88	100
3. Chloropicrin	200	101	103
4. Chloropicrin	300	98	102
5. Chloropicrin	400	101	102
6. InLine	50	88	93
7. InLine	100	83	94
8. InLine	200	95	99
9. InLine	300	99	104
10. InLine	400	107	102
11. Untreated	0	87	77
12. MB +Pic	300	100	100
$LSD_{0.05}$		21	16

Table 2. Average strawberry marketable yields relative to MB/Pic from Oxnard soils treated with Pic and InLine under VIF and standard mulch.

Fumigant	Rate lbs/ac	% yield under standard PE	% yield under VIF
1. Chloropicrin	50	95	96
2. Chloropicrin	100	98	98
3. Chloropicrin	200	94	101
4. Chloropicrin	300	102	108
5. Chloropicrin	400	102	107
6. InLine	50	90	93
7. InLine	100	92	97
8. InLine	200	96	101
9. InLine	300	104	107
10. InLine	400	101	107
11. Untreated	0	74	80
12. MB +Pic	300	100	104
$LSD_{0.05}$		11	13