METHYL BROMIDE ALTERNATIVES IN SOUTHERN CALIFORNIA STRAWBERRY PRODUCTION: A FARMER'S PERSPECTIVE

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Methyl bromide, as a component of a preplant soil fumigation mixture, aids in effectively controlling soil-borne pests and pathogens, and is crucial to profitably farming the vast majority of strawberry acreage in California. Due to the accelerated methyl bromide phase-out schedule from the Ninth Meeting of the Parties to the Montreal Protocol and the USEPA Clean Air, Coastal Berry Company is conducting, in conjunction with the CSC, USDA, Tri-Cal and BASF, a three year on-farm methyl bromide alternative trial with the most likely methyl bromide alternatives. The trial is being conducted in Oxnard, California, which accounts for approximately 23% of the commercial strawberry acreage in the state. The following is a brief summary covering the first two years of the trial.

During the 1996-97 growing season 0.5 acre plots of methyl bromide:chloropicrin (57:43, 375 lbs/acre), chloropicrin (200 lbs/acre), and Telone C35 (400 lbs/acre) were applied as preplant soil fumigants on the flat and covered immediately with sealed polyethylene tarps. Fumigants were applied by a commercial fumigant applicator. Sixty-four inch planting beds were prepared with slow release fertilizer, two drip irrigation lines/bed and covered with clear polyethylene mulch. 'Camarosa' strawberry transplants were planted 15 inches apart in four rows on each bed on October 1, 1996. Farmer standard strawberry IPM production practices were followed throughout the growing season. The effects of preplant soil fumigation with methyl bromide:chloropicrin, chloropicrin and Telone C35 was based on the cumulative fresh market yield collected by weekly harvest from December 29, 1996 through April 12, 1997.

During the 1997-98 growing season 0.5 acre plots of methyl bromide:chloropicrin (57:43, 375 lbs/acre), chloropicrin (200 lbs/acre), and Telone C35 (400 lbs/acre) were applied to the same area as the previous year (chloropicrin following chloropicrin, Telone C35 following Telone C35, etc.) as preplant soil fumigants on the flat and covered immediately with sealed polyethylene tarps. Fumigants were applied by a commercial fumigant applicator. Sixty-four inch planting beds were prepared with slow release fertilizer, two drip irrigation lines/bed and covered with clear polyethylene mulch. Basamid was applied

to 0.25 acre plots at the rate of 350 lbs/acre and 450 lbs/acre by incorporation into pre-made beds, which were covered immediately with full bed clear polyethylene mulch. 'Camarosa'

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strawberry transplants were planted 15 inches apart in four rows on each bed on September 29, 1997. Farmer standard strawberry IPM production practices were followed throughout the growing season. The effects of preplant soil fumigation with methyl bromide:chloropicrin, chloropicrin and Telone C35 was based on the cumulative fresh, processing and juicemarket yield collected by weekly harvest from January 2, 1998 to June 11, 1998.

The results on fresh market yield expressed as a percentage of the yield from the appropriate farmer's methyl bromide:cholorpicrin treatment for the 1996-1997 and 1997-1998 production seasons are summarized in Table 1. During the 1996-1997 season both chloropicrin and Telone C35 out-yielded the methyl bromide:chloropicrin farmer's standard by 2.6% and 7.0% respectively. During the 1997-1998 season methyl bromide:chloropicrin out-yielded chloropicrin, Telone C35 and Basamid at 350 lbs/acre and 450 lbs/acre by 9.5%, 14.2%, 0.8% and 6.9% respectively. Significant soil-borne pathogen pressure was not observed in the trial area in either growing season. Weed population differences between fumigants were noticeable but not quantified in either growing season.

Based on the limited data available it appears the methyl bromide alternatives as tested here do not perform consistently relative to methyl bromide:chloropicrin or relative to the alternatives tested here. For example, in the 1996-1997 growing season both chloropicrin and Telone C35 treatments had greater yields that the methyl bromide:chloropicrin treatment, but in the 1997-1998 season the yield from the methyl bromide:cholorpicrin treatment was considerably greater that that of either chloropicrin or Telone C35. In the 1996-1997 trial the yield from the Telone C35 treatment was greater than the cholopicrin treatment, while in the 1997-1998 trial the yield from the chloropicrin treatment was greater than the Telone C35 treatment.

In addition to the above there are concerns regarding:

Regulatory - buffer zone restrictions take large areas out of production and there are severe limits on the amount of Telone C35 that can be used in a township.

Efficacy - all alternatives studied here are not as efficacious as methyl bromide:chloropicrin in some respect (weed control, soil borne pathogen control, etc.)

Cultural - for the alternatives tested plant-back is 4-6 weeks beyond that of the existing methyl bromide:chloropicrin plant back requirement

Economics of production – yield is but one measure of the worth of an alternative; what are the methyl bromide alternative costs with volume? What are the monetary and

environmental costs associated with the lack of efficacy of the alternatives (weed control, additional pesticide applications that may be needed, etc.)?

Future work

For the 1998-1999 growing season chloropicrin, Telone C35 and chloropicrin + Vapam (for weed control) will be compared to methyl bromide:chloropicrin.

Table 1. Fresh market yield across seasons, rates and application methods under methyl bromide alternatives as a percent of fresh market yield from MBr/Pic preplant fumigated soil. Fumigants were applied on the flat except for Basamid, which was bed incorporated.

	1996-1997		1997-1998	
Fumigant	**Rate (lbs/acre)**	**Yield (as %MBr/Pic yield)**	**Rate (lbs/acre)**	**Yield (as %MBr/Pic yield)**
MBr/Pic (57/43)	**325**	**100.0%**	**325**	**100.0%**
Chloropicrin	**200**	**102.6%**	**200**	**90.5%**
Telone C35	**400**	**107.0%**	**400**	**85.8%**
Basamid			**350**	**99.2%**
Basamid			**450**	**93.1%**