# METAM SODIUM AND METAM COMBINATIONS A VIABLE REPLACEMENT FOR METHYL BROMIDE

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A frequently heard statement is that there is no silver bullet for the replacement of methyl bromide. It should be said that there is currently not a single EPA registered compound, in the current use pattern, that will replace the combination of methyl bromide plus chloropicrin (66/33) (MBr-Pic) for strawberries grown under plastic. Metam sodium (metam), in combination with Telone C-35 (1-3D-Pic) and MBr-Pic were compared in the IR-4 trials in the 1999-2000 growing season. Potential alternatives to MBr-Pic were evaluated in the IR-4 program on strawberries in four locations, two in California and two in Florida. In this report only metam and metam plus 1-3D-Pic will be compared to MBr-Pic. The method of application for metam at 75 gpa was by drip irrigation. In Oxnard (40-inch bed top) metam was applied with three drip tubes and in Salinas and Florida (20 and 28-inch bed tops, respectively) metam was applied with two drip tubes per bed. Metam, at 37.5 gpa was applied as a surface spray in 500-1,000 gallons of water per acre at time of polyethylene mulching for weed and pest control in surface 4-5 inches. 1-3D-Pic was applied by drip lines in California and by injection in Florida. Metam was applied in combinations with 1-3D-Pic as a surface spray 7-14 days prior to drip application of 1-3D-Pic and immediately following injection of 1-3 D-Pic, (at time of polyethylene mulching).

The yield data from 1999-2000 IR-4 strawberry trials in California and Florida from metam in combination with 1-3D-Pic were equal to the standard 67/33 MBr-Pic treatment (Table 1). Metam was effective for the control of weeds and pests in the surface 2-4 inches of the beds when applied as a spray on the surface at time of application of polyethylene mulch. The only practical measurement of efficacy is total yield of the crop. In Oxnard and Salinas, California combinations of metam and 1-3D-Pic (Inline Telone-C35 EC) had yields of 4,160 and 3,300 crates/acre, respectively, compared to MBr- Pic yields of 3,507 and 3,494. In the two tests sites in Florida strawberry yields in the metam combined with 1-3D-Pic were 2,341 and 1,542 compared to MBr- Pic yields of 2,245 and 1,334 (table 1). The average yield in the four test sites was 2,450 for the metam 1-3D combination and 2,312 crates/acre for MBr-Pic.

In 1999-2000, IR-4 trials were conducted in Florida and California on tomatoes comparing metam to MBr-Pic. Tables 2 and 3 present the data on metam, 1-3D and MBr-Pic. (Data from the California trials were not available of at time abstract preparation.) The efficacy of metam incorporated into the soil and drip applied was comparable to MBr-Pic injected for the control of nutsedge, root-knot nematodes and yield increase. Application of metam by incorporation was consistently superior to applications by drip irrigation. This again

illustrates the need to determine the proper method of application when applying metam. The incorporation of metam at 75 gallons per acre was comparable to MBr-Pic (66/33) injected at 350 pounds per acre for control of weeds, nematodes and increase in yield.

In 2000-2001, the Metam-Sodium Task Force research program will concentrate on metam efficacy in plastic culture for strawberries, tomatoes and other vegetables with special emphasis on efficacy as related to methods of application. Application studies will include drip, incorporation and injection. Metam will also be included in the 2000-2001 IR-4 program on strawberries and tomatoes in Florida and California. Current research will continue studies to assess movement of metam in relation to the water phase when applications is made using drip irrigation. Also, studies will be initiated to determine the fate of metam in the soil following application by water and incorporation.

Table 1
1999-2000 IR-4 Data on Strawberry Yields

| Treatment | Rate/Method | Oxnard CA | Salinas CA | Dover-B FL | Dover-C FL | Avg Yield |
|---|---|---|---|---|---|---|
| Planted | | 10/01/99 | 11/10/99 | 9/18/99 | 10/25/99 | |
| Control | | 2494 h | 2280 e | 613 e | 25 e | 1347 |
| Metam | 75 drip | 2779 gh | 2586 de | 1730 d | 458 de | 1774 |
| Metam/1-3D | 37.5/ 32 gpa | 4160 a | 3300 ab | 2341 b | 1542 ab | 2450 |
| MB-Pic | 350 lbs | 3507 cd | 3496 a | 2245 b | 1354 ab | 2312 |
| Metam | 37 gpa | 2627 h | 2301 e | 463 e | 13 e | 1348 |

Metam was applied at 75 and 37.5 gallons per acre
Metam at 75 gpa was applied by drip irrigation with Three drip tubes per bed at Oxnard and two drip tubes per bed at Salinas, Dover-B and Dover-C
Metam at 37.5 gpa applied as a surface spray at time of polyethylene mulching

1-3D: 1-3D -Pic applied by drip in California (Telone C35EC, 32 gpa)
1-3D-Pic shank injected in Florida (Telone C-35, 32 gpa)

MBr-Pic (67-33) injected 8-10 inches deep on 12-inch centers

Varieties: Oxnard and Dover-C *Camarosa*; Salinas*, Diamante;* Dover-C Sweet *Charley*

Table 2
Comparative Efficacy of Metam Sodium for Pest Control
And Yield Of Tomatoes in Florida

Live Oaks - Planted 3/29/3000, Final Harvest 6/27/00

| Treatment | Rate Acre | Nutsedge | Root-knot J2 6/05 | Root- knot gall - 6/27 | Yield Cartons |
|---|---|---|---|---|---|
| Metam | 75gpa-D | 9.0c | 633abc | 2.6d-g | 286c-e |
| Metam | 75gpa-Inc | 0.0c | 29c | 0.8g | 333b-e |
| MBr-Pic | 350 (67/33) | 14.5c | 2c | 1.2fg | 349bcd |
| 1-3D-Pic | 35 gpa | 25.5bc | 282abc | 3.7b-f | 295c-e |
| Control | | 139a | 774ab | 6.2ab | 255c-e |

Lake Jem, Florida - Planted 3/24/00 Final Harvest 6/29/00

| Treatment | Rate | Nutsedge 4/27 | Root-knot J2 5/29 | Root knot gall 6/22 | Yield ** Cartons |
|---|---|---|---|---|---|
| Metam | 75 gpa -D | 4.8abc | 1.5 b | 3.2bc | 846 |
| Metam | 75 gpa- Inc. | 3.0bc | 0.0b | 2.2cd | 888 |
| MB-Pic | 350 (67/33) | 0.0bc | 0.5b | 0.6d | 940 |
| Telone C35 | 35 gpa | 0.3c | 0.0b | 0.6d | 831 |
| Control | | 9.5abc | 26a | 5.7a | 405 |

Rate for metam expressed as gallons per treated acre

D -drip applied with three tubes per 24-inch bed

Inc.- applied to surface of bed and incorporated in surface 10-12 inches

MBr-Pic injected into preformed beds at 350 pounds/acre with shanks on 12-inch centers

1-3D+Pic, Telone C35 injected at 35 gallons/acre with shanks on 12-inch centers

Root-knot, J2 per 100 cc of soil

Yield, number of 25-pound cartons per acre