REVIEW OF POTENTIAL METHYL BROMIDE ALTERNATIVE (MBA)

PRODUCTS UNDER EVALUATION IN MINOR CROPS BY IR-4

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In 1998 IR-4 began addressing the methyl bromide replacement needs of US minor crop producers through cooperative efforts with sponsoring companies, contract and private research organizations and scientists working on this problem within the university systems of California and Florida and USDA/ARS. Since running the first company-sponsored, large scale tests in production strawberries and fresh market tomatoes in the fall of 1999, IR-4 has completed 16 trials, eight each in California and Florida. IR-4 expanded its MBA programs in 2002 to include green pepper in Florida, summer squash in Michigan and ornamental/flower bulb crops in California and Florida. A number of products or product combinations have shown promise in the IR-4 programs as replacements for methyl bromide based on crop safety and efficacy against plant parasitic nematodes, soil borne fungal pathogens and weeds in strawberries, fresh market tomatoes, peppers and the bulb crops. A brief discussion of products evaluated in the IR-4 MBA programs follows.

Chloropicrin EC: Beginning in 2002, this product was included both as a stand alone treatment in California and in combination with low rates of metam sodium for weed control with excellent results comparable to the standard methyl bromide/chloropicrin 67:33 (MB/PIC) treatment. It must be "partnered" with a weed control product for reliable full spectrum control and there are several possibilities including low rates of metam sodium, dazomet, and the new MBA candidates, halosulfuron methyl and trifloxysuluron sodium (in tomatoes).

Telone/Inline: These products have given consistently excellent results in the IR-4 programs with performance equal to the MB/PIC standard treatment in most trials run since 1999. Like chloropicrin EC, a weakness of these products is that a weed control partner is generally needed for optimal performance, especially in Florida where weeds are a highly significant problem.

Metam sodium: Metam sodium has been the primary product used with other MBA candidates needing weed control partners and it has performed well at low rates for this purpose. When used properly, full rates of metam sodium in stand alone treatments have also frequently performed well but generally not as well as the MB/PIC standard in the IR-4 trials. Considering the cost of metam sodium in relation to MB/PIC it may be a very good alternative even though the yields may not measure up to yields given by the standard.

Basamid (dazomet): This product has been shown to be an excellent partner with either chloropicrin or Telone/InLine and the combinations have consistently given results in the IR-4 trials comparable to the MB/PIC standard. Basamid enjoys official MBA status by EPA and is undergoing priority data reviews for fast track regulatory decisions.

DiTera ES: This is a biopesticide with specific activity against nematodes. Combination treatments with DiTera ES plus chloropicrin for control of phytopathogenic fungi and metam sodium for weed control have performed well in strawberries.

PlantPro 45 and PlantPro 20EC: These products are highly efficacious against a broad spectrum of soil borne plant diseases and parasitic nematodes and some weeds but must be used under precise conditions to avoid crop damage. Because of this the company has decided not to pursue development in strawberries but will continue with developmental plans in tomatoes, a crop with greater crop tolerance.

Fosthiazate: This product is an official MBA candidate for nematode control and it has given excellent results in combination with chloropicrin for control of fungal pathogens and low rates of metam sodium for weed control.

Enzone: Two formulations were evaluated in the IR-4 MBA programs in 2002, both in combination with chloropicrin and metam sodium. Performance was mixed this year resulting in good results comparable to the MB/PIC standard in some trials and but poor in others, depending upon the formulation. The Enzone combinations have performed very well in trials completed in the past, consistently equal to the MB/PIC standard.

MULTIGUARD™ products: MULTIGUARD™FFA and MULTIGUARD™ PROTECT are naturally derived methyl bromide alternative candidates that are undergoing extensive evaluation in the IR-4 MBA programs in tomatoes and strawberries. They have also been included in several other IR-4 MBA programs including green pepper and summer squash. Results at this time are inconclusive but point to the need for rate and/or use pattern refinement to optimize efficacy.

Propozone: This product has performed very well in California strawberries producing yields equivalent to the MB/PIC standard in a test arranged with Driscolls by IR-4.It was drip-applied at 30 and 60 gallons per acre in the Driscolls test. It has also given control of yellow and purple nutsedge in Gladiolus bulbs in a Florida test when shank-injected at 30 gallon per acre. It does seem to have a good fit as a methyl bromide alternative even though results have been less than acceptable compared to the MB/PIC standard in some trials.

CX-100: This is a new entry in the IR-4 MBA programs and to date results have been mixed ranging from excellent nutsedge control in Gladiolus bulbs when applied by sprayer and incorporated by rotovator to poor control when drip-applied. It has excellent potential as a methyl bromide replacement but more work is needed to optimize performance. Trials are underway in several crops to do this.

Results from IR-4's 2002 methyl bromide alternatives programs in strawberries and tomatoes will be discussed in detail by personnel from Plant Sciences, Inc.,Watsonville, California in separate presentations.