METHYL BROMIDE TRANSITION STRATEGY FOR FLORIDA FRUIT AND VEGETABLE CROPS

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Florida growers, who have continued to rely on existing and internationally approved CUE supplies of methyl bromide, painfully recognize an increase in price, a future of diminishing supply, and the limits to which methyl bromide use rates can be reduced without loss of pesticidal efficacy and crop yield. Local competitive pressures have led to Florida growers being reluctant to transition to new integrated pest management strategies which include co-application of different fumigants and herbicides, and adoption of other alternative cultural practices to achieve pest control efficacy and crop yield response similar to that of methyl bromide.

Transition to the alternatives also suggest that growers will have to implement other significant changes to current practices, including integration of new fumigant distribution and soil injection technologies, and new tillage and irrigation practices to enhance the performance of alternatives and reduce potential fumigant emissions from treated fields. Since all currently registered fumigant alternatives are also likely to have further restrictions that may limit their use as a result of shifts in regulatory criteria (i.e., reduced rates, expanded buffer zones, worker exposure risks) emission reduction strategies including high barrier (more gas impermeable) plastic mulches are recommended to reduce overall field application rates and soil emissions of fumigant gases. Grower transition to these new IPM methods will be incrementally driven by methyl bromide supply, and by many other available products on-farm, within field, pest, soil, crop, and economic considerations. The primary objective for any methyl bromide transition strategy is to schedule adoption over time and minimize changes to the crop production system and performance inconsistency of alternatives.

Clearly the time has arrived to document and describe a process for an orderly transition and implementation of the alternatives. Many different timelines and acreage commitments to alternatives can be envisioned. A

seamless transition would commit new acreage to alternatives at a rate equal to or greater than the rate that methyl bromide annually decreases in supply. Figure 1 depicts a timeline for transition to alternatives as an inverse function of CUE approved levels of new methyl bromide production. This projected transition timeline would indicate a need for Florida growers to commit 30 to 40% of their acreage to alternatives by the end of calendar year 2006, and to 70% and 90% by the end of 2007 and 2008, respectively.

Beginning the transition allows growers to strategize an on-farm implementation plan to minimize production problems, gain valuable worker experience with the alternatives, and to preserve methyl bromide use for their most difficult pest management fields. Transition to the multi-chemical combination treatments will be more difficult and less forgiving than that of methyl bromide. Given the steepness of the learning curve for use of the alternatives, Florida growers currently dependent upon methyl bromide are strongly encouraged to begin the commitment and transition to alternatives without further delay.

Use of VIF or high barrier plastic mulch films will be a required component of the any methyl bromide transition strategy. Based on our current understanding, we currently only recommend use of a high barrier plastic mulch film with a MBr permeability coefficient of less than 14 g/m^2/ hr with any fumigant. Use of these more gas retentive mulches will however, require changes in field application and soil injection equipment to insure accurate and uniform dispensing of such low fumigant application rates (5 to10 gallons per acre). These required changes include smaller delivery tubing size (1/8 to 1/16 inch diameter), installation of sight gauges to monitor flow uniformity among chisel streams, and installation of a low pressure gauge upstream of the flow divider to monitor overall back pressure (at least 15 psi) at the flow divider. A monitoring program to assess residual gases in soil should be considered before a commitment to planting is made.

Transition refers to an incremental change from current status. Defined in this way, a change from a 40 year old system of being totally reliant on methyl bromide to a new multitactic pest control and crop production system. The transition will surely require a different outlook on the entire production system. The transition is not likely to be as easy or seamless. If the transition plans are well designed and implemented effectively, problems are likely to be few. Unavoidably however, some factors that affect the success or failure of the various tactics, such as the environment, may not be completely manageable or resolvable. For

example, seasonal differences in temperature and rainfall patterns can adversely effect fumigant dissipation from soil, and herbicide efficacy and thus reduce the value of the alternative by causing treatment inconsistency. Growers can also cause significant response variability due to inappropriate land preparation or substandard application procedures. Another newly emerging concern is the risk created by the differential plant-back restrictions of some of the newly registered herbicide compounds that have to be added for weed control with the alternative fumigants. The impacts on the ability to double crop, as well as potential direct yield production as a result of carryover from row middle or previous crop applications, are also of concern.

Effective transition planning can only be achieved through a collaborative effort involving the grower and his field staff, commodity organization involvement, assisted by university research and extension personnel. Working together, the team should craft a realistic transition plan that addresses many of the production concerns and inconsistencies. The transition plan would also surely highlight the imperative that Florida fruit and vegetable growers actively begin the transition, to increased reliance upon the alternative fumigants as a percentage of their total farmed acreage.

Fig. 1. ***Project annual rates of Florida gower transition from reliance on methyl bromide chloropicrin soil fumigation to other alternative chemical and nonchemical strategies. Anticipated transition to alternatives are plotted relative to Critical Use Exempted (CUE) methyl bromide levels.***