Ways to Enhance the Technology Transfer Process of Post-Harvest Methyl Bromide Alternatives

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Licensed fumigators/suppliers of post-harvest fumigants have a unique perspective on methyl bromide alternatives and the potential problems associated with the transfer of technology that will be required to successfully introduce these new products.

Fumigation companies or suppliers have been heavily involved with research projects spearheaded by various manufacturers who are seeking registrations for methyl bromide alternatives. This co-operative approach is proving to be a successful means for introducing these new products. Choosing the right cooperator is very critical in this process, for they must have extensive knowledge of how methyl bromide is currently used, how the new materials should be tested and applied, and how to analyze the data, observations and results of the many field trials that have been performed. From this information, the fumigator/supplier can predict the potential uses, problems that may commonly occur, and whether these new products are economically feasible. In cooperation with the manufacturer, they can develop a plan for the transfer of technology of these new products.

Transfer of technology will require a fumigator/supplier to utilize their knowledge, intuition, and past experiences to contribute to the process. They must also be receptive to new concepts and changes in methodology, for these new products will sometimes require a much different approach to fumigation. Cardinal Professional Products has been involved in field trials using: (1) Methyl Bromide and Carbon Dioxide, (2) Phosphine, (3) Phosphine and Carbon Dioxide, (4) $ECO_2FUME^{®}$, and (5) Sulfuryl Fluoride. Tests have been performed in fumigation chambers, silos, warehouses, mills, sea containers, grain bins, and rail cars. From these trials, Cardinal has concluded that Phosphine, $ECO_2FUME^{®}$, and Sulfuryl fluoride can be very good methyl bromide alternatives, with each product having specific advantages and disadvantages. $ECO_2FUME^{®}$ received California registration in July 2001 and was slow to succeed in the market. The slow introduction was necessary in order for Cardinal to become familiar with the product and to learn how it should be applied and properly marketed. If a quick, mass-marketing approach was used, $ECO_2FUME^{®}$ could have failed miserably. $ECO_2FUME^{®}$ required extensive analysis and planning for each fumigation, and was not readily accepted by California applicators. However, within one year, $ECO_2FUME^{®}$ became very successful, and is now in very high demand. This can be attributed to the successful transfer of new technology to an industry mostly resistant to change. This process has given Dow AgroSciences insight to the challenges involved with the introduction of their new fumigant, ProFume™ (sulfuryl fluoride).

Suggestions for ways to enhance the transfer of new technology are:
(1) Allow for a significant amount of time to implement these new products and the new attitudes which will be required by the industry. New attitudes from management to the

fumigator and their crew will be essential, due to “Precision Fumigation” techniques. This new approach to fumigation will require significant changes to the old fumigation practices.
(2) Education through mandatory product stewardship classes will be critical, and follow-up on the stewardship requirements are paramount to the future success of these products.
(3) Allow for increased fumigation budgets. Most alternatives will cost more than methyl bromide fumigations, but these new fumigation technologies will provide higher quality fumigations, and much safer applications. Whenever new products are introduced, they are more closely scrutinized by all entities, especially the regulators.
(4) Choose the right cooperators. Manufacturers must team up with the most knowledgeable and experienced cooperators to assist with field trials, economic analysis, product stewardship training, and marketing of the new alternatives.

With this type of strategy in mind, manufacturers will have successful introductions of methyl bromide alternatives.