

TECHNOLOGY TRANSFER OF PROFUME™ GAS FUMIGANT

Ed Hosoda

Cardinal Professional Products

ProFume™ has been registered in California since May 2005, and has proven to be a very cost-effective alternative to methyl bromide. Every year, thousands of post-harvest fumigations occur in California, which gives us an opportunity to thoroughly investigate alternative products. We have come to the conclusion that ProFume™ is a viable and promising fumigant for the future.

ProFume™ is faced with many challenges in its development and use in the food industry. Methyl bromide has a proven track record in providing excellent control of all life stages of stored product pests, thereby providing a baseline for comparison of any new or alternative products. In the first fifteen months of using ProFume™ in California, we have investigated many different methods of application, and have carefully evaluated its performance. We have discovered that in order to provide a successful fumigation, and using the concept of "Precision Fumigation™", fumigation procedures must be revamped to accommodate these new techniques. Extensive preparation is absolutely necessary when using ProFume™, which must be followed up with precise dosing, monitoring, and evaluation of the gas retention rate (Half Loss Time). By thoroughly understanding how this fumigant works within various structures, you can make educated estimations or forecasts for subsequent fumigations, which allow you to make decisions on how to efficiently use ProFume™, and how to be assured that target dose requirements (C-T Product) will be attained.

We have successfully used ProFume™ in large rice mills in California that required over 5,000 lbs. of methyl bromide in a single application. At those mills, we effectively replaced those pounds with 4,500 lbs. of ProFume™, and have received excellent reviews from the mill management. After the initial fumigation, we were able to characterize the Half Loss Times of various sections of the mill, and utilized that information to reduce doses in certain areas for the next application. This resulted in a net savings to the mill operators.

Over the last few years, we have experienced phosphine tolerance in *Rhyzopertha dominica* (Lesser grain borer) in stored grain and rice in Northern California. Lesser grain borer has been found to survive multiple fumigations with phosphine, causing considerable problems with shipping and milling schedules. In the past, methyl bromide was the alternate product of choice, but has obviously become a supply concern. We began experimenting with ProFume™ for this use, and discovered that it is extremely

effective in controlling Lesser grain borer with 24 hour exposures. One of the application challenges was to find a method of attaining quick equilibrium within typical grain storage structures. By experimenting with various re-circulation methods, we have found ways to distribute the gas evenly and quickly, and by using “Precision Fumigation” techniques, we have been very successful in resolving this tolerance issue.

The transfer of alternative technology, coupled with “Good Fumigation Practices” will allow the fumigation industry to realize the potential for ProFume™ as a cost-effective fumigant for the future.