

# ProFume™ Could Be MB Alternative

Dow AgroSciences scientists are evaluating a new postharvest tool—final in a series

Last issue we described a new fumigant, ProFume ([www.profume.com](http://www.profume.com)), which Dow AgroSciences ([www.dow-agrosciences.com](http://www.dow-agrosciences.com)) is developing as a possible option for managing

insects in stored products after the methyl bromide (MB) phaseout planned in the United States by 2005. (ProFume is not currently available; U.S. Environmental Protection Agency registration is pending.)

ProFume's active ingredient is sulfur fentanyl fluoride (SF). SF has been sold under the trade name Vikane™ and used to control structural pests such as termites and wood boring beetles.

This article is the final part of an interview with Dow AgroSciences scientists Drs. Brian Schneider, Biology Team leader for postharvest fumigants, and Suresh Prabhakaran, field research scientist for the Midwestern United States, who are developing ProFume for postharvest uses.

*(Editor's note: See page 64 of the fourth quarter 2002 Milling Journal for the first part of the interview.)*

Read on to find out more about how ProFume works and what it can do for the milling industry.

**Q.** *What stages of stored-product insects are tolerant to ProFume, and what dosages do you recommend for use in commodities as opposed to spaces in food-processing facilities? Please give a range, as the dosage would vary based on commodity and environmental conditions.*

**A. Schneider:** ProFume is effective in controlling all life stages of stored product insect pests. However, the egg stage is the most tolerant of all life stages. Effective dosages for eggs vary by species.

Temperature also significantly affects the lethal dosage. As temperature increases, the lethal dosage decreases.

The ProFume Fumiguide™ will display the effective dosage for many of the key stored product pests across a range of environmental conditions.

[The ProFume Fumiguide is a computer-based program that provides the

power to do precision fumigations. It includes information on biology and practical use of ProFume.]

Dosages do not vary by commodity, but rather, the quantity of fumigant is based on the factors mentioned earlier.

Absorption into food commodities, however, is low relative to methyl bromide and does vary to a degree by commodity.

The Fumiguide will provide the fumigator with the ability to adjust the amount of fumigant introduced based on a list of key commodities and the load factor.

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“The elaborate project completed at Kansas State University on wheat quality effects indicated that fumigating wheat kernels [with ProFume] at the maximum-labeled rate did not adversely affect the grain quality.”

*Suresh Prabhakaran, Dow AgroSciences*

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Our plan is to provide the fumigators with tools that can help them make fumigation decisions based on their wealth of experience, resulting in the most efficient fumigation possible.

**Q.** *What are the effects of ProFume on the subsequent quality of the fumigated products?*

**A. Prabhakaran:** We are working with scientists from Kansas State University (KSU), University of Arkansas, and Purdue University to identify potential quality effects on commodities exposed to ProFume.

The elaborate project completed at

KSU on wheat quality effects indicated that fumigating wheat kernels at the maximum-labeled rate did not adversely affect the grain quality.

These studies focused on the physical, nutritional, and rheological properties of wheat exposed to the gas.

Wheat flour fumigation will be limited by maximum residue limits (MRLs), and proposed label-permitted exposures are not expected to affect flour quality.

Exposures of wheat flour above the label permitted dosage (above the MRL) affected viscosity measures.

The practical conclusion is that the ProFume use pattern for wheat flour will essentially be the same as for MB, where exposure to wheat flour is limited.

Studies on quality effects of ProFume on rice are underway at University of Arkansas. These studies are designed to detect any quality effects on rough rice, milled rice, or rice flour.

Head rice yield, cooking quality, pasting quality, and nutritional profile are some of the tests that will be completed under this project.

Similar to rice, corn quality studies are underway at Purdue University. These studies will evaluate physical, chemical, nutritional characteristics, and end-use processing tests such as wet milling performance, dry milling performance, etc. on corn samples exposed to SF.

In addition, we have also completed a set of germination studies on rice, wheat, corn, oats, and barley. The results indicated that ProFume exposure at the maximum-labeled rate did not affect germination.

Additional quality evaluation studies on other commodities, cocoa, processed foods, and pet food are being planned now.

Pest Management



Dr. Bhadriraju Subramanyam

**Q.** Are Fumigation Management Plans (FMPs) necessary when using ProFume? If so, are there guidelines developed for characterizing gas concentrations?

What are the gas levels (in ppm) that are of importance, and what equipment is reliable for gas measurements?

**A. Schneider:** This question can be answered two ways. From a strict ProFume label perspective, a complete FMP is not required.

The ProFume label will require though that the ProFume Fumiguide be used to determine dosage and that all label instructions be followed.

*"ProFume is effective in controlling all life stages of stored product insect pests. However, the egg stage is the most tolerant of all life stages. Effective dosages for eggs vary by species."*

Brian Schneider, Dow AgroSciences

From the point of view of doing an effective and safe job, an FMP is a necessity. We highly recommend that fumigators have an FMP for every job.

That's one of the reasons we have invested so much effort in the ProFume Fumiguide. It provides an efficient and powerful means for fumigators to prepare for fumigation and then records the dosage outcome and other valuable information.

Using information from previous jobs, the fumigator can prepare an FMP for the next fumigation, each time becoming more efficient and likely improving safety.

Relative to the second part of your question, when the label is approved, Dow AgroSciences will provide thorough training on safety guidelines and exposure standards.

The Interscan™ and the Miran™

gas analyzers are the presently approved detection devices for low level concentration (ppm [parts per million] range) readings and clearance of structures fumigated with ProFume.

**Q.** Please describe your commitment to ProFume product stewardship.

**A. Schneider:** Dow AgroSciences is committed to ProFume product stewardship in the same thorough manner that we steward Vikane gas fumigant in the structural market.

First, this means that we will prepare

and conduct a full range of user-oriented training programs, both in the classroom and at actual fumigations.

We will also have a signed agreement between the fumigator and Dow AgroSciences concerning key safety precautions.

Part of this program involves on-site visits to confirm safety compliance and provide further guidance when necessary. Dow AgroSciences is committed

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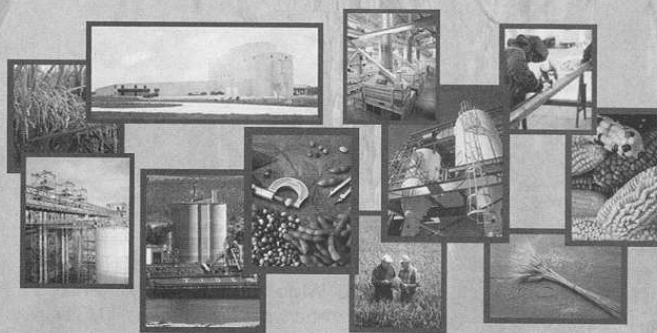
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to proactively identifying, investigating, and managing issues that could negatively impact both ProFume and the fumigation industry.

**Q.** I understand that Dow AgroSciences and its scientists involved in developing ProFume received an award? Could you please share that information with our readers?

**A. Prabhakaran:** Yes, Dow AgroSciences was recently awarded the 2002 Stratospheric Ozone Protection Award by the U.S. Environmental Protection Agency for the development of ProFume gas fumigant.

This award recognizes extraordinary achievements, international leadership, and innovation in preserving the Earth's protective stratospheric ozone layer.

**Q.** Who are the resource personnel to contact for additional information or questions on ProFume?

**A. Schneider:** Questions or request for additional information on ProFume can be directed to the following individuals listed below.

In addition, information can also be obtained from the Web sites provided below.

*Bhadriraju Subramanyam (Subi) is an associate professor in the Department of Grain Science and Industry at Kansas State University, Manhattan; 785-532-4092, bhs@wheat.ksu.edu.*



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317-257-5795

*Joy Rogers*—Catoosa, OK  
918-266-1641

*Ken Phelps*—Granite Bay, CA  
916-791-1127

### Field Technical Support by Region

*Suresh Prabhakaran*  
Indianapolis, IN  
317-834-2975

*Bob Williams*  
Moorpark, CA  
805-520-9224

### U.S./Global Headquarters

*Jane MacMillan*  
ProFume marketing specialist, 9330  
Zionsville Road, Indianapolis, IN 46268;  
317-337-7598

*Damon Shodrock*  
Customer technologist, 9330 Zionsville  
Road, Indianapolis, IN 46268; 317-337-  
4416; [dlshodrock@dow.com](mailto:dlshodrock@dow.com)

*Brian Schneider*  
Biology Team leader, 9330 Zionsville  
Road, Indianapolis, IN 46268; 317-337-  
4385; [bmschneider@dow.com](mailto:bmschneider@dow.com)

### Web Sites

[www.Profume.com](http://www.Profume.com) (information available when ProFume is registered)  
[www.dowagro.com](http://www.dowagro.com)

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