



KANSAS STATE UNIVERSITY RESEARCH SHOWS LOWER RATES OF DOW AGROSCIENCES' FUMIGANT ELIMINATES BED BUG POPULATIONS.

BY STEVE SMITH

Above: Entomology Professor Tom Phillips (left) and Research Assistant Jamie Aikins (right) prepare sulfuryl fluoride dilutions and measure SF concentrations for insect fumigation research at Kansas State University.

The U.S. Environmental Protection Agency recently approved a label change allowing Dow AgroSciences' fumigant Vikane to be used against bed bugs at reduced rates. The change is based on research conducted at Kansas State University and, according to Dow AgroSciences, the label change makes the use of Vikane even more viable for residential bed bug jobs.

Pest management professionals have been using Vikane (sulfuryl fluoride) for decades as a fumigant, primarily for drywood termite control. However, with the advent of bed bugs as the nation's hot-button pest, PMPs have been increasingly looking at fumigation as a means for bed bug control.

"Bed bugs have been growing in pest status for a number of years. As a result, we started to get more and more requests from the pest control industry for Vikane fumigant as a bed bug control option," says Dr. Ellen Thoms, field scientist, Dow AgroSciences.

This prompted Dow to look at the effectiveness of Vikane against bed bugs when used at reduced rates. "The dosage rate on Vikane was developed in the 1960s when bed bugs weren't a serious problem in North America," Thoms says. However, previous research had indicated that Vikane could be effective against bed bugs at lower rates. In order to get a label change that allowed PMPs to apply Vikane at lower rates for bed bugs, Dow needed to submit new data to EPA.

Dow turned to Kansas State University Entomologist Thomas Phillips, Ph.D., who conducted trials re-evaluating dosage rates required to eliminate bed bugs. “Tom had been doing a lot of research with sulfuryl fluoride efficacy, primarily with stored product pests, so that’s why we approached him about performing this additional research. There are very few labs set up to do this type of research as fumigation research requires special skills and equipment. We set up a research protocol with Dr. Phillips that was approved by EPA and got to work validating that bed bug eggs, nymphs and adults could be controlled at the lower dose rate,” Thoms says.

Phillips’ work showed that at both 77°F and 59°F, Vikane used at 1.9-fold the termite rate completely eliminated bed bug adults, late-instar nymphs and eggs.

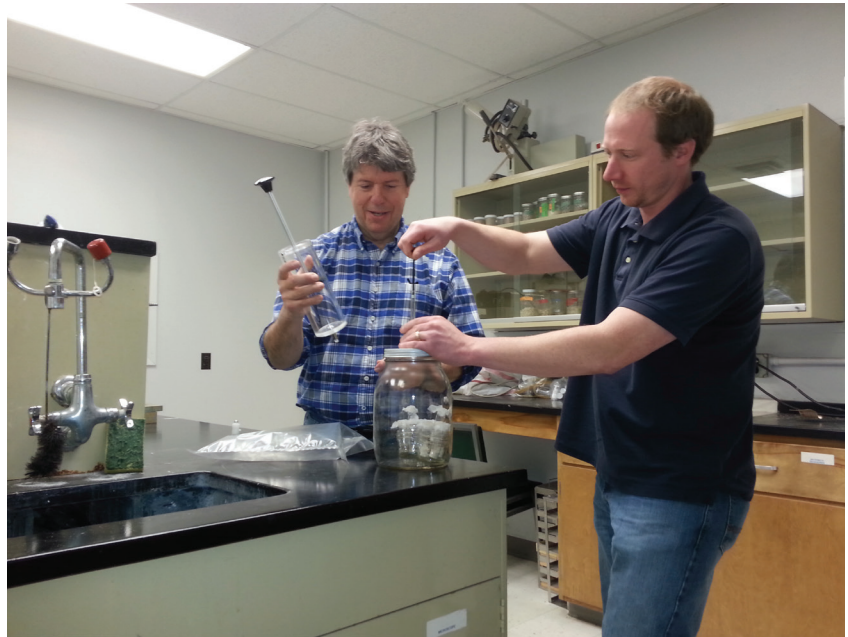
Two temperatures were studied to ensure control would be achieved in the residential environment, Phillips says.

“If the temperature in an infested building is cool and a fumigator comes in to do a bed bug treatment with Vikane, they want to be sure it’s going to kill all the stages of the insect,” he says. “The room temp of many homes is 75°F, and many rooms will be even warmer than that. If we can kill all stages of the bed bug at 77°F, you’re going to get a good kill at even a higher temperature. Our research verified the same dosage factor, 1.9x, controls bed bugs over a wide temperature range.”

As a result of Phillips’ data, EPA approved a new label for Vikane allowing 1.9x rate for bed bug fumigation as compared to the previous rate of 3x.

WHY FUMIGATION? In cases where multiple rooms or whole-home treatments are required for bed bug control, the use of heat treatments can become quite costly, Thoms says. And that’s where fumigation with Vikane, particularly at the new, reduced rate, can be economically viable, she added. Further treatment of bed bugs via fumigation virtually guarantees elimination without adverse effects on electronics, fine furnishings and other household contents.

“Right now where we see fumigation expanding rapidly for bed bugs is in those markets where fumigation is



Above: Tom Phillips, entomology professor at Kansas State, uses a large syringe to transfer fumigant gas from holding bag to a fumigation jar while Research Assistant Jamie Aikins uses a smaller syringe to get a sample of gas for quantitative GC-MS analysis.

Right: Jamie Aikins, KSU research assistant, sorts and counts insects in preparation for a fumigation experiment.



already used extensively — Florida, California, Hawaii, etc. It’s well suited for single-family homes with two or more rooms that are moderately or heavily infested,” Thoms says. Fumigation also fits well with containerized fumigations, where items are removed from a home or office building and placed in a truck cargo container which is treated with sulfuryl fluoride, she added.

Phillips explains: “Gasses penetrate all areas of a structure. Therefore, if fumigation is done properly — with the appropriate concentration, treatment time, lack of leakage and at a proper temp — it can be the most effective control option available to the PMP.”

The need for evacuating an entire hotel and the subsequent loss of revenue results in hotels being fumigated only

when bed bug infestations are extensive. “In contrast to fumigation, you can keep the hotel in safe operation using heat treatments on targeted rooms,” Phillips says. Nonetheless, it’s clear there is a growing place for fumigants in residential bed bug control, particularly because of the reliability of elimination that can be achieved, Thoms added. **PCT**

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