

# The Stored-Pest Management Dilemma

Lack of funding, logistical issues prevent researchers from finding 'real-world' solutions

During the past six years or so, greater emphasis has been placed on management of stored-product pests using reduced-risk products or alternatives rather than traditional chemical methods.

## Pest Management



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This was instigated by the 1996 Food Quality Protection Act, methyl bromide phaseout, and phosphine reregistration.

Other contributing factors were consumer preference for organic foods, foods free of

pesticide residues, and the creation of new federal programs that provide financial support for research institutions to seek pesticide alternatives for insect management.

Since 1990, I have been working on reduced-risk products and nonchemical methods for managing stored-product insects and was one of the researchers who developed a fruitful research program at Kansas State University, as a result of the availability of federal support for various projects.

Researchers at the USDA's Grain Marketing and Production Research Center in Manhattan, KS; Oklahoma State

University, Stillwater; and Purdue University in West Lafayette, IN, also are involved in examining various pesticide alternatives for management of stored-product insects and have benefited from the federal support.

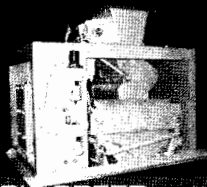
Furthermore, all of the changes mentioned above have brought researchers at these institutions together to pool resources, avoid duplication of research work, and conduct collaborative research and educational projects for the grain, food and feed, and pest control industries.

Outstanding research on stored-product insects and their management also is being conducted by scientists throughout the United States and by several pest control companies and pesticide registrants.

Compared to other countries, the United States has a tremendous research and knowledge base regarding stored-

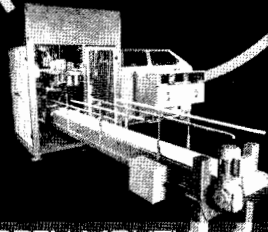
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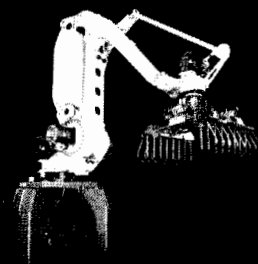
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product insects and their management.

#### The Real Issue

Although we have plenty of information and research on stored-product insects and their management, we have not developed comprehensive integrated pest management (IPM) programs for managing insects in raw commodities, processing plants, warehouses, and retail environments.

For example, we recommend that producers, elevator managers, and commercial store managers follow a set of guidelines for managing insects in stored commodities. The guidelines include:

- Sanitation of empty facilities.
  - Application of a suitable residual product.
  - Sanitation of the grain.
  - Application of a protectant.
  - Monitoring commodity for changes in temperature and moisture.
  - Monitoring for insects.
  - Aeration, if such facilities exist.
- For food processing plants, I have seen suggested recommendations that include:
- Inspection of inbound and outbound materials and the plant.
  - Using various crack and crevice

treatments.

- Monitoring insects using pheromone traps.
- Using structural treatment (fumigation or heat).
- Stock rotation.

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Conducting an evaluation of all of the recommended practices in "real-world" settings is difficult because of issues related to funding and logistics.

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- Following various exclusionary tactics.
- For warehouses and retail environments, there are suggested sanitation and exclusion practices and need-based intervention with chemicals.

There is limited research information to show benefits of these recommended practices. In other words, the effectiveness of one or two of the recommended

techniques in suppressing insects is studied, mostly in a laboratory or pilot-scale setting.

With industry providing accessibility to their facilities, more data now are being generated that are relevant to the "real world."

I am not trying to diminish the work of researchers by pointing this out. The opinions expressed here are mine, and some of my colleagues may disagree with me.

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For example, our research from four flour mills in Kansas and Nebraska showed that 80.1% of 439 flour samples collected from various locations had one or more stored-product insects.

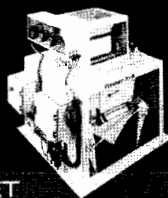
This finding underscores the importance of sanitation in removing insects, but our efforts to determine the exact sources of infestation of these insects was futile, especially in a complex mill environment.

Unless we know these sources, it is difficult to evaluate the effectiveness of a pest management intervention.

Several studies have shown population ►

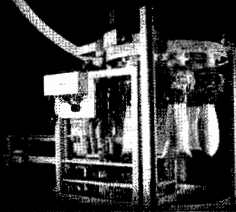
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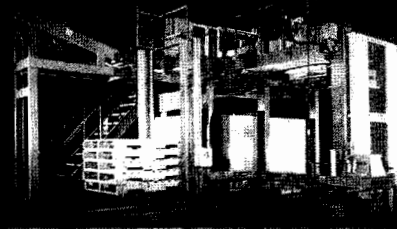
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rebounds of stored-product insects after fumigation or heat treatment, and one can blame the treatments as being ineffective, when in essence, the population rebound could be a result of improper inbound inspection resulting in insects being brought in on infested product and poor exclusion practices such as leaving doors or windows open.

We need statistically-valid protocols for conducting inbound and outbound inspection of products and for conducting inspections of processing facilities to detect and estimate insect numbers.

In our research in retail stores, a thorough sanitation and application of approved residual products (Gentrol and Tempo) did not completely eliminate insect infestation, because we were unaware of the insect sources.

In these stores, we observed a total lack of inbound inspection and removal of infested packages stocked on shelves.

What are the benefits of multiple sanitation schedules in processing facilities, warehouses, and retail environments in reducing insect infestation? This question has not yet been answered through research.

#### Funding Problems

Why haven't we been able to conduct

research on various IPM tactics for specific commodities, processing plants, warehouses, or retail stores?

The biggest problem is lack of consistent and non-competitive funding or limited funding, both from the private sector and the federal government. Part of the problem is

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related to the areas of emphasis of individual researchers. Some do applied research on pest management methods (insect growth regulators, fumigants and alternatives, reduced-risk chemicals, and trapping), while others do fundamental research (insect biology, behavior, physiology, and genetics).

Even in the area of applied research, we have researchers who work on specific

aspects of the problem.

Researchers collaborate closely on various projects, and we need to continue to work together for developing and implementing IPM programs that are representative of the "real world." There is a lot of work being done on insect growth regulators, residual products, fumigants, heat, ozone, monitoring pests and understanding pest movement, vacuum, ionizing and non-ionizing radiation, sanitation, and exclusion for management of stored-product insects.

Researchers, in cooperation with all stakeholders who benefit from this information, should develop customized IPM programs in "real-world" settings. Matching support and interest from the industry are needed to assist researchers in developing and implementing sustainable IPM programs, in stored products, from the farm to the table.

Furthermore, economic analysis should be an integral and essential part of any pest management program.

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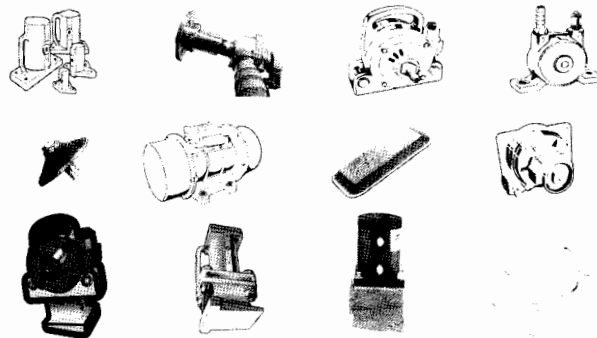
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