

VTPP Quarterly

A Newsletter From Virginia Tech Pesticide Programs

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Banded vs. Broadcast Pesticide Application

Daniel Frank – Director, VTPP

Effective pest management is crucial for agricultural productivity, and the method of pesticide application can play a significant role in determining both pest control success and environmental sustainability. Two common pesticide application methods, banding and broadcasting, offer distinct advantages and disadvantages. Choosing the appropriate method depends on various factors, as there is no universally right or wrong approach.

Banded Pesticide Application

Banded pesticide application, or “banding,” involves applying pesticides in parallel strips across a field. These bands can be made directly over or alongside crop rows

(fig. 1), leaving untreated areas in between, or applied between rows to manage pests in the alleys of an established crop (fig. 2).

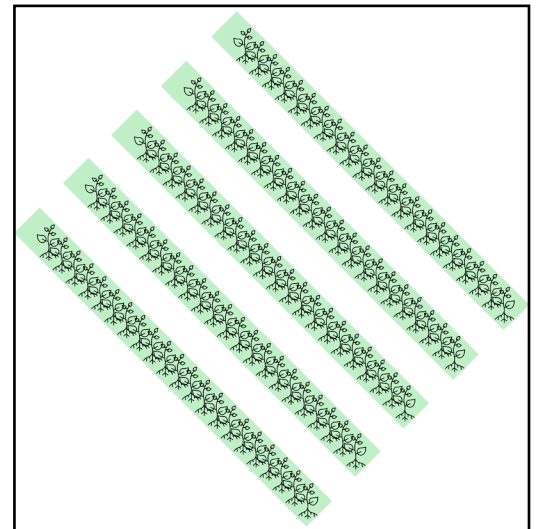


Figure 1. Banded application over crop rows.

Banding offers several advantages, particularly its ability to reduce chemical usage. By treating only

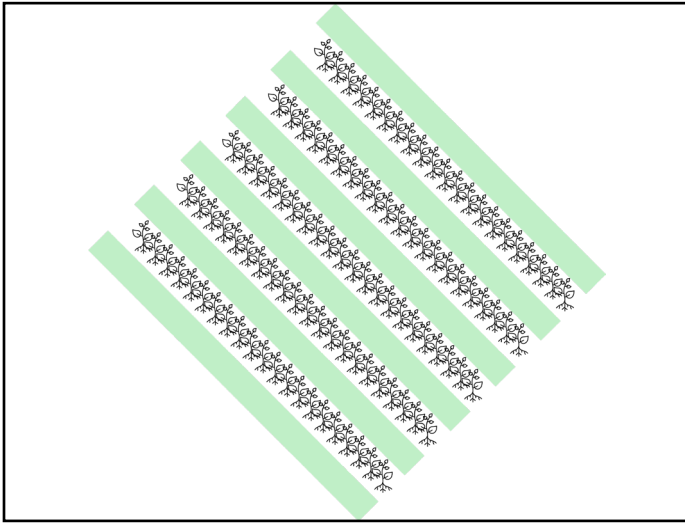


Figure 2. Banded application between crop rows.

a portion of the field, banding requires less pesticide than broadcast applications. This can translate to significant cost savings for farmers. Banding also ensures that pesticides are applied precisely where they are needed most, minimizing unnecessary exposure to nontarget areas. This targeted approach can ultimately reduce environmental and human health risks.

Despite these benefits, banding has some drawbacks. First, it requires careful positioning of the nozzles in relation to the crop rows, particularly when pesticide application is performed separately from planting. Additionally, regular nozzle tips along a boom must be replaced with even flat fan spray tips to ensure uniform coverage over the band. Furthermore, because areas between the bands remain untreated, pests in these zones may survive and potentially reinfest the crop. This can limit the overall effectiveness of control.

Because pesticide labels typically list broadcast rates (i.e., amount of formulated product per acre), product rates and water volume will need to be adjusted for banded applications. When applying pesticide by banding, determine the amount of product and water volume needed by using the following formulas:

$$(\text{band width [in]} \div \text{row width [in]}) \times \text{broadcast rate/acre} = \text{band rate/acre}$$

$$(\text{band width [in]} \div \text{row width [in]}) \times \text{broadcast volume/acre} = \text{band volume/acre}$$

Broadcast Pesticide Application

Broadcast pesticide application, or “broadcasting,” involves applying pesticides uniformly over the entire field, covering both crop rows and the spaces between them (fig. 3). This method ensures all parts of the field are treated. Broadcast applications are often faster to implement, particularly in large-scale operations or challenging terrain. Unlike banding, broadcasting typically requires less equipment and eliminates the need for precise nozzle alignment for row-specific targeting, significantly simplifying the process.

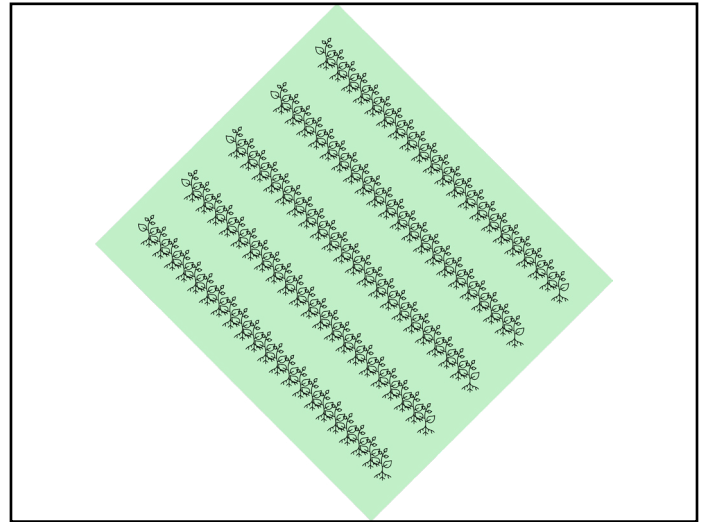


Figure 3. Broadcast application to entire crop field.

However, broadcast applications come with their own set of challenges. This method often involves higher pesticide use, leading to increased costs for farmers. The greater treated area also increases environmental and human health risks, which can make broadcasting less sustainable in some contexts.

Choosing the Right Method

The decision between banded and broadcast application will depend on several factors. Annual wide-row crops, such as corn and soybean, often benefit from banding due to its efficiency and reduced chemical usage, whereas broadcasting may be more suitable for more densely planted crops. In fields with high pest pressure, broadcast application might be necessary to address widespread infestations, while banding is generally sufficient for managing more localized pest problems. Additionally, farms located in environmentally sensitive areas may favor banding as it minimizes potential runoff and protects nearby ecosystems. Although banded applications can offer

cost savings on pesticide inputs, it may require an investment in specialized equipment to ensure its effectiveness.

Conclusion

Both banded and broadcast pesticide application have their place in modern agriculture, and the choice between them should be based on a thorough evaluation of the specific circumstances. While banding promotes sustainability and cost savings, broadcasting provides comprehensive pest control and operational simplicity. Finding the right balance between effectiveness and environmental stewardship is key to optimizing agricultural productivity and ensuring long-term sustainability.

Farm to Storage: Quick Guide to Stored Product Pest Management

Kathleen Miller – Extension Associate

With harvest season behind us, it's easy to feel safe from the threat of pests. Unfortunately, the risk of pest damage can still be a concern for stored agricultural products, as well as food and fabrics stored in the home.



Figure 4. The granary weevil (*Sitophilus granarius*) is a primary feeder that damages the internal germ of grain. Both the adult and larval stages contribute to grain damage. (Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org.)

Stored Product Pest Damage

Infestations of stored products are primarily caused by the larval and adult stages of beetles and the larvae of moths. These pests can reduce the weight of stored food and contaminate it, and damage clothing

and other materials by chewing holes. Both types of insects can significantly reduce a product's quality and value.

Damage to stored food

Insect pests affecting stored food products can be classified as either primary (internal) or secondary (external) feeders. Primary feeders can damage intact grain, focusing their feeding on the internal germ, which reduces the grain's nutritional value and ability to sprout (fig. 4). The internal damage caused by primary feeders also makes the grain more susceptible to secondary feeders. Secondary feeders feed only on damaged grains, kernel dust, and debris.

Damage to stored fabric

Insect pests damaging stored fabric primarily feed on items made from animal fibers, such as wool, fur, hair, leather, silk, and felt. Feeding damage creates holes or fraying and can lead to complete destruction of the fabric item (fig. 5).



Figure 5. Furniture carpet beetle (*Anthrenus flavipes*) – adult (top) and larvae (bottom). Damage caused by this insect is primarily due to larval feeding, which often results in fabric fraying. (Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org.)

Preventative Management Tactics

To reduce the likelihood of pest infestations and damage, preventative measures should be implemented before storing food products or fabrics.

Preventing infestation in stored food

Before binning recently harvested agricultural

products, ensure you are storing them in a space that is not already infested. Similarly, inspect home pantries and closets for any signs of infestation prior to adding new food items or fabric. Foods that are particularly susceptible to infestation include flour, rice, cereals, cornmeal, popcorn kernels, and pet food.

Preventing infestation in stored fabric

Fabric-feeding insects target items made from animal fibers and can be found among clothing, rugs, and furniture. These pests are particularly attracted to fabrics soiled with food, perspiration, or urine. Prior to storing these items, ensure they are clean. When inspecting for signs of infestation in fabrics, focus on dark or undisturbed areas such as furniture crevices, underneath carpeting, or within the folds of clothing.

Once in storage, protect foods and fabrics by practicing good sanitation. Sanitation of a storage area can be as simple as sweeping or vacuuming food and debris from the ground, walls, shelves, and fans.

To further reduce the risk of infestations, store foods and fabrics in sealed areas or containers. However, in some cases, especially in agricultural settings, having a well-sealed storage area may not be feasible. In such situations, consider applying residual insecticides to the walls and floors of storage bins to create a protective barrier against pests. You can also use grain protectants as a preventative measure when storing grain expected to be kept for over a year. When applied according to label instructions, grain protectants help safeguard stored grain by killing feeding insects. Similarly, stored fabrics can be protected with a chemical deterrent (e.g., naphthalene mothballs).

Pest Identification

Despite your best efforts to prevent a pest infestation, one may still occur. If you detect pests or signs of damage, the first step is to accurately identify the pest. Online resources, such as Purdue’s “Stored Grain Pest Management” and the University of Georgia Extension’s “Stored Product Pests in the Home,” can help with pest identification. You can also contact Virginia Tech’s Insect ID Lab for additional assistance. Once you identify the pest species causing the damage, use information about its biology to select

the most effective management strategies.

Monitoring of Stored Product Pests

Prior to employing curative measures, it is important to monitor for stored product pests. Monitoring stored product pests is just as important as monitoring in any other agricultural setting. Regular monitoring provides valuable insight into when to apply management tactics or if they are needed at all. Setting up sticky traps or pheromone-baited traps in storage areas – both in agricultural settings and at home – is a simple, effective way to monitor pest populations and assess the need for curative actions (fig. 6).

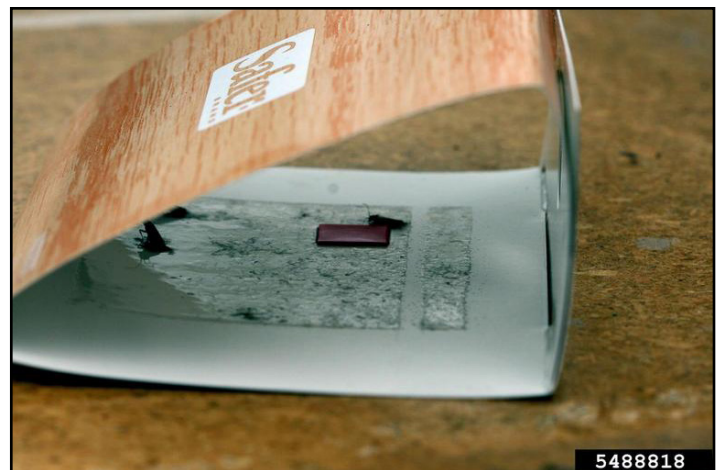


Figure 6. A pheromone lure paired with a sticky trap can be used to monitor pest populations in home and agricultural settings. (Whitney Cranshaw, Colorado State University, Bugwood.org.)

Curative Management Tactics

If monitoring reveals a pest infestation, several curative tactics can be used as part of an integrated pest management approach.

Agricultural settings

In grain bins, topdressing the surface of stored grain with insecticides can help eliminate insects at the surface level and prevent further infestation from the top. However, this method is unlikely to effectively manage existing infestations deeper within the bin. Instead, deeper infestations may be better managed through fumigation by a pesticide applicator certified in Virginia’s Category 7C (Non-Soil Fumigation). For moth populations, placing pest strips at the top of the bin can be an effective way to trap adult moths and reduce the likelihood of population growth.

Home settings

For infestations in pantries, closets, or other home areas, start by vacuuming or sweeping, disposing of infested products, and washing soiled materials. After removing or cleaning infested materials, you can apply a properly labeled insecticide to the area surrounding the infestation – including infested carpeting, rugs, or furniture. To avoid staining, thoroughly clean the surface and test the insecticide on a small, inconspicuous area before full application. Use extra caution when applying insecticides near food storage and preparation areas. Focus on treating cracks, crevices, and surfaces within the infested area. Remove all stored products before treatment, and ensure all treated surfaces are completely dry before returning food items to the space.

Staying Safe

When managing pest populations in any setting, safety is paramount. Because the label is the law, all pesticide use must strictly adhere to the instructions provided on the product label. This includes using the product only at specified application sites and rates, wearing the required personal protective equipment, and handling treated foods and fabrics properly after treatment. Using pesticides near food and clothing poses additional risks, so always use extra caution to minimize exposure and ensure safety.

Additional Resources

- Purdue Extension – [Stored Grain Insect Pest Management.](#)
- University of Georgia Extension – [Stored Product Pests in the Home.](#)
- [Virginia Tech Insect ID Lab.](#)

Blast From the Past

Stephanie Blevins Wycoff – Extension Associate

Rootone With Fungicide Hormone Powder

This antique jar contained a product known as Rootone and was manufactured by AMCHEM Products, Inc. (fig. 7). It was sold as a powder and contained a rooting hormone to promote root growth on fresh plant cuttings, but also a fungicide to prevent fungal diseases from infecting new cuttings. The compounds of this product were first patented in the early 1940s. However, this branded product wasn't registered with the Environmental Protection Agency until 1952. Rootone contained four growth regulators for root development and the fungicide Thiram. Each

jar could treat up to 3,000 plant cuttings. Rooting hormone powders such as this are still commonly used today in the nursery and greenhouse industries.



Figure 7. Rootone with Fungicide Hormone Powder, circa 1950s-1960s.

Program Updates

VTPP Updates

VTPP will continue to host our online PAR course until midnight on Feb. 28, 2025. There is a \$30 fee for this self-paced online recertification course that provides full credit for Categories 90 and 91. Share the below registration link with any private applicator(s) who may be interested in this option.

tinyurl.com/VCE-VTPPPAR-90-91

You can also find the registration at register.ext.vt.edu by searching under Programs and then under Agriculture or Natural Resources, or by using keywords (i.e., pesticide, applicator, private, recertification, PAR, private applicator, VTPP, Category 90, Category 91).

For guest account issues, please call the helpline at 540-231-3131 or email vceprograms@mail.ext.vt.edu.

NATIONAL PESTICIDE SAFETY EDUCATION MONTH

February
is

National
Pesticide
Safety
Education
Month!

- There are about 1 million certified pesticide applicators in the U.S.*
- 11,000-15,000 pesticide products are registered for use in each state.*
- Common consumer products that contain pesticides include
 - Flea collars.
 - Ant and roach traps.
 - Some lawn care products like weed and feed.
- Pesticide Safety Education Programs (PSEPs) are housed at land-grant universities.

*Facts provided by National Stakeholder Team for PSEP Funding

8th Annual NPSE Month - Pesticide Stewardship Resources:

- vttp.org
- pesticidestewardship.org

Organized by the National Stakeholder Team for Pesticide Safety Education Program Funding, this month-long awareness campaign aims to reinforce safe pesticide use with a wide variety of audiences.