VTPP Quarterly

A Newsletter From Virginia Tech Pesticide Programs

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The Endangered Species Act and Pesticide Labels

Daniel Frank – Director, VTPP

Pesticide labels have been changing, and more updates are expected as the Environmental Protection Agency (EPA) implements new strategies to better protect endangered species from pesticide exposure. This effort is part of the EPA's compliance with the Endangered Species Act (ESA), a longstanding federal law that impacts pesticide registration and use. The first of these strategies, the Herbicide Strategy, was released in August 2024. Additional ESA strategies for insecticides and fungicides are expected in the coming years.

Herbicide Strategy

The recently published Herbicide Strategy outlines measures to mitigate pesticide runoff and spray drift, which can pose risks to threatened plant and animal species. While this strategy specifically addresses conventional herbicides used in agriculture across the lower 48 states, it is expected to influence broader pesticide regulations over time. By focusing on protecting plant species, the strategy indirectly benefits the animal species that depend on them for food and habitat.

Mitigation Requirements

Implementation of ESA strategies will require adding mitigation requirements to pesticide labels that address factors such as runoff, erosion, and drift. These changes will be implemented gradually over the next several years. Updated product labels (e.g., Enlist One, Enlist Duo, Liberty Ultra) will feature a picklist of mitigation options. Applicators will be required to earn a set number of mitigation points

as outlined on the label, with the flexibility to choose the practices that best suit their operations. Detailed options will be provided on the labels and the EPA's Mitigation Menu website. In some regions, applicators may face stricter requirements based on local environmental conditions and the area's susceptibility to runoff and erosion.

Pesticide Use Limitation Areas

Another key component of this initiative is the introduction of Pesticide Use Limitation Areas (PULAs), which designate locations where stricter pesticide application guidelines will apply to protect endangered species and their habitats. Before applying a pesticide, applicators will need to consult the EPA'S Bulletins Live! Two website to determine whether an application site falls within a PULA. If so, they must follow any additional mitigation measures outlined in the corresponding Endangered Species Protection Bulletin. This check can be done on the day of application or up to six months in advance to assist with planning. To determine whether a pesticide is subject to these restrictions, always refer to the product label. If a label instructs the user to obtain a Bulletin, they must check the Bulletins Live! Two website for site-specific requirements. In areas designated as PULAs, the Bulletin could mandate additional actions such as

- Establishing buffer zones.
- Reducing application rates.
- Restricting application timing.
- Restricting the use of certain pesticides.

Pesticide applications made outside the PULA or beyond the specified time period in the Bulletin are not subject to its restrictions. However, you must still print or obtain a copy of the Bulletin as proof that you checked for applicable restrictions. As with all pesticide application records, you are required to maintain documentation showing that you reviewed and complied with PULA requirements in your area, if directed by the product label.

Moving Forward

The EPA's new ESA strategies are designed to balance agricultural productivity with environmental stewardship. The goal is to ensure pesticide use remains effective while minimizing harm to protected species. While all of the new label changes won't take effect overnight, it is essential for applicators to stay informed about upcoming adjustments and begin planning accordingly. As these strategies take shape, maintaining compliance will require diligence and adaptation. By staying proactive and informed, applicators can ensure their operations remain both productive and environmentally responsible in the years to come.

Additional resources:

- North Central IPM Center – Updates to Pesticide Labels and Mitigation Options; Protection for Endangered Species.

Introduction to Adjuvants (Part 1 of a 2-part series)

Kathleen Miller and Stephanie Blevins Wycoff – Extension Associates

Overview

When preparing for upcoming pesticide applications, using the correct adjuvants — and understanding how to use them safely and effectively — can significantly improve application success. An adjuvant is a chemical added to a pesticide product or spray mixture to enhance its performance or alter its characteristics. Adjuvants come in various forms and may already be included in a pesticide formulation by the manufacturer or added by the applicator during tank mixing. Although adjuvants help improve the safety and efficacy of a pesticide, they do not possess pesticidal properties and are not considered active ingredients. Before using an adjuvant, always consult the product label(s) to ensure its use is permitted and will benefit your specific application.

Types of Adjuvants

Water Conditioning Agents

This type of adjuvant is used when the water source for tank mixing is known to be hard. Hard water contains high levels of dissolved minerals such as calcium, magnesium, and iron. These minerals exist as positively charged ions, known as cations, which can easily bind with negatively charged pesticide molecules. When this binding occurs in the spray tank, it can deactivate the pesticide or reduce its effectiveness. Adding a water conditioning agent can help prevent this interaction and keep pesticide

molecules available to perform as intended. A commonly used water conditioning agent is ammonium sulfate (AMS).

Compatibility Agents

This type of adjuvant is added when tank mixing multiple products to reduce the risk of incompatibility. Some crop protection products are known to be incompatible, meaning they cannot remain uniformly mixed in the spray tank. Incompatibility may be physical or chemical and can cause products to separate, clump, form gels or sludge, generate heat or gas, and more (fig. 1). Pesticide product labels may include warnings about incompatibility and recommend specific compatibility agents for certain tank mixes. If you are unsure how two or more crop protection products will interact when mixed, it is good practice to perform a jar test before your planned application.

Figure 1. This jar test shows an example of product incompatibility — the mixture has separated. After adding a compatibility agent, repeat the jar test to see if the products are now compatible.

Antifoaming and Defoaming Agents

These types of adjuvants are used to control foam formation in spray mixtures, which can occur due to agitation or the presence of certain surfactants (fig. 2). Foam is formed when air becomes trapped in the spray mixture, potentially leading to inaccurate and ineffective applications and increased risk of drift. Antifoaming agents are typically used preventively to stop foam from forming, while defoaming agents are used after foam has developed to break it down. These adjuvants work by reducing the surface tension of air bubbles or disrupting the foam's structure, causing it to collapse.

Figure 2. Vigorous agitation of some pesticide products can lead to the formation of foam (Prissy Fletcher, University of Florida, Institute of Food and Agricultural Sciences).

Thickeners and Drift Retardants

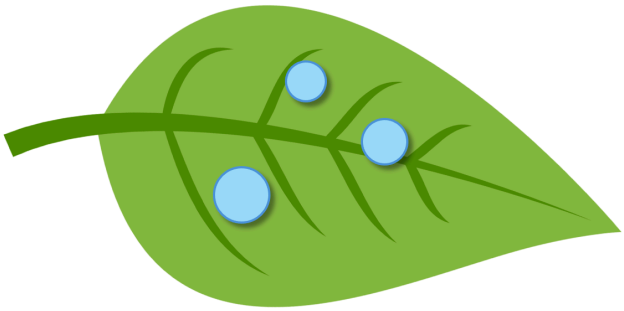
These types of adjuvants are added to the spray mix to reduce the risk of pesticide movement through the air to nontarget areas — a phenomenon known as drift. Drift can damage nearby crops or harm sensitive sites such as homes, schools, or water bodies. In addition to wind speed, pesticide droplet size plays a large role in drift potential, with smaller droplets more likely to be carried off-site. Thickeners and drift control retardants control drift by modifying the physical properties of the spray solution, with effectiveness depending on the type of spray mixture and equipment used. Thickeners increase the viscosity of the spray mix, resulting in larger droplet formation. Drift retardants work in a similar way by binding water molecules together to form larger droplets, further reducing the likelihood of off-target drift.

Oil Concentrates (Plant Penetrants)

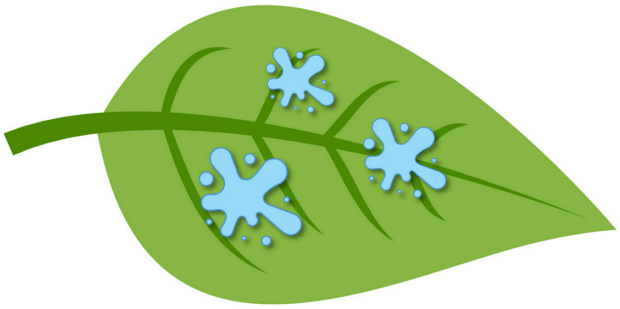
Oil concentrates are designed to enhance the penetration of pesticides through the leaf surface. This category of adjuvants includes three main sub-groups: crop oil concentrates, methylated seed oils, and high-surfactant oil concentrates. While each sub-group differs in composition, they all function

While each sub-group differs in composition, they all function to soften the leaf's waxy layer and reduce surface tension. This allows the pesticide to penetrate more effectively into the plant.

Surfactants
This type of adjuvant is added to the spray mix when the treatment site includes surfaces that are difficult to penetrate, such as waxy or hairy leaves or thick insect exoskeletons. Surfactants reduce the surface tension of spray droplets, allowing them to disperse, stick, or spread more evenly across the target surface (fig. 3). Common types of surfactants include wetting agents and spreaders. It is extremely important to follow pesticide label recommendations when selecting a surfactant. Using the wrong surfactant can reduce pesticide efficacy and potentially cause severe crop damage.



Spray Droplets Without Surfactant



Spray Droplets With Surfactant

Figure 3. The top image illustrates spray droplets beading up on a leaf without a surfactant. The bottom image shows how adding a surfactant to the spray mix can help droplets spread out and increase spray coverage.

Stickers
This type of adjuvant is added to the pesticide spray mix to help droplets adhere to the treated surface. Stickers are used to prevent pesticide runoff during and after the application. They can help keep the pesticide in place by minimizing wash-off from rain and reducing drift caused by wind. Stickers also reduce evaporation and slow down pesticide degradation. When used correctly, they can improve the overall effectiveness of the application.

Buffers and pH Modifiers
These types of adjuvants are used to adjust or maintain the pH of a spray mixture. pH modifiers adjust the pH of a spray mixture, typically lowering the pH to create a solution that is closer to neutral. Buffers help maintain pesticide stability when the mixture includes water, fertilizers, or pesticides of differing acidity or alkalinity. Most pesticide formulations are stable between a pH of 5.5 and 7.0. If the spray solution falls outside this range, the pesticide could degrade quickly, reducing its effectiveness. Adding a buffer or pH modifier to the spray tank before introducing pesticides or other adjuvants can help maintain a stable, near neutral pH. This creates a more reliable and effective spray mixture, ensuring the active ingredients remain stable throughout the mixing and application process.

Coming Up!
In part 2 of our "Introduction to Adjuvants" series, we will discuss how to select adjuvants and properly incorporate them into pesticide tank mixes.

Blast From the Past

Stephanie Blevins Wycoff – Extension Associate

Myers Jumbo Spray Nozzle

This antique brass nozzle was sold by the F. E. Myers & Bro. Company of Ashland, Ohio (fig. 4). In the early 1900s, this company manufactured a variety of spray pumps, nozzles, and accessories, which they marketed primarily to fruit tree growers.

Figure 4. A front view of the Myers Jumbo Spray Nozzle.

Figure 5. The Myers Jumbo Spray Nozzle deconstructed.

The Myers Jumbo Spray Nozzle was designed to deliver a very broad, fine spray intended for better coverage. Figure 5 shows the nozzle deconstructed, which includes a nozzle cap (with a hardened steel disc and rubber washer underneath), a reversible stainless steel whirl plate, a brass cone strainer, and a nozzle body.

Program Updates

VTPP Updates

2025 IPM Workshop and Pesticide Safety Educators' Workshop

Mark your calendars for the 2025 IPM Workshop and Pesticide Safety Educators' Workshop (PSEW), our annual in-service trainings for Virginia Cooperative Extension (VCE), Agriculture and Natural Resources agents and specialists. The IPM workshop will be held on Wednesday, Sept. 3 and Thursday, Sept. 4 at the Hotel Roanoke. PSEW will overlap with the IPM workshop and be held Thursday, Sept. 4 and Friday, Sept. 5 at the same location. The IPM workshop is designed to equip agents with relevant and practical IPM information they can incorporate into their regular programming, as well as provide resources for developing more specialized IPM programming in their counties. PSEW updates agents and specialists on pesticide applicator training procedures and practices, as well as recognizes the outstanding teamwork enjoyed between the Virginia Department of Agriculture and Consumer Services, Office of Pesticide Services (VDACS-OPS) and VCE. Registration and information for both events will be available later this summer.

VCE Recognition Awards

VDACS-OPS is opening the nomination period for the Virginia Cooperative Extension Recognition Awards Program. Agents who conducted programs between April 1, 2024, and March 31, 2025, may be nominated for an award. Awards are given for outstanding programs in the following categories:

- Pesticide Safety Education.
- Pesticide Container Recycling.
- Pesticide Disposal.

Nominations are due by June 30, 2025. For more information and the nomination packet, contact Rachel Parson at rparson@vt.edu or 540-231-4639.

VDACS Updates

Pesticide Collection Program

Virginia's Pesticide Collection Program helps agricultural producers, licensed pesticide dealers, pest control companies, golf courses, and homeowners safely dispose of unwanted pesticides. The program is managed by VDACS in collaboration with Virginia Cooperative Extension and the Division of Consolidated Laboratory Services.

Since its launch in 1997, the program has successfully collected and destroyed over 1.9 million pounds of

of pesticides. Funded by pesticide fees collected by VDACS, it operates without using general fund tax dollars. The Pesticide Collection Program is available at no cost to eligible participants.

How the Pesticide Collection Program Works

Participants are required to transport their unwanted agricultural and commercial pesticides to a central collection site, where a hazardous waste disposal contractor will package the pesticides for proper disposal. If a participant is unable to safely transport the pesticides, the program may arrange for the pesticides to be containerized for transport.

Virginia's Pesticide Collection Program is organized into five regions, with each region hosting a collection event annually. Once all five regions have been served, the program begins a new cycle.

How to Participate

1. Complete the Pre-registration Form.
2. Return the Pre-registration Form 30-days before the collection event to: Marlene Larios at marlene.larios@vdacs.virginia.gov or fax 804-371-2283.
3. Select the pesticide collection location and date for drop-off.

Resources and Questions

Eligible participants are encouraged to contact their local Virginia Cooperative Extension office or the VDACS Office of Pesticide Services for additional information. Other resources include

- 2025 Pesticide Collection Brochure.
- Map of Participating Localities for 2024-2028.
- List of Participating Localities 2024-2028.

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