



All About Adjuvants

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Not All Adjuvants are the Same

Weed control, in any region, on any crop, is the goal of a grower. Resistant weeds continue to plague the crop fields of America. Agricultural pesticide companies have resorted to using more modes of action chemistries to control weeds. We are now seeing herbicides that include two, three and yes, four herbicide active ingredients in their formulations. More than 70 percent of all herbicides recommend using one or more adjuvants in the spray mixture. In general, there are two types of adjuvants: formulation adjuvants already built into the herbicide product and tank-mix adjuvants. Formulation adjuvants are “already in the container” from the manufacturing process and generally there is not enough in there to effectively control weeds. Tank mix adjuvants are added to help with mixing, handling, effectiveness, and providing consistent performance.

Every year the Weed Science Society of America (WSSA) lists **both** the most troublesome and most common weeds of America. On those two lists, there are 3-perennial weed suspects appearing: Palmer amaranth, lambsquarter and morning glory. In the major crops, whether it's those three weeds, and/or waterhemp in corn, marestail in soybeans or pigweed in cotton, herbicides need help in controlling resistant weeds. Adjuvants pick up the pace when added to herbicide tank mixes. However, your father's adjuvants are just not going to cut it going forward. Not all adjuvants are the same. Those 80/20 and oil-based “single dimension” adjuvants are just not good enough anymore in being part of

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the solution to help control and kill herbicide resistant weeds. Just as an example, it is documented that “one pigweed plant produces up to a million seeds during a growing season”. You need to choose the right adjuvant to work with your herbicide to control those resistant weeds.



Water Hemp in Iowa after being treated with Round-Up and HOOK

Choosing the Right Adjuvant

Growers must choose wisely when selecting an adjuvant to work with their herbicides to control resistant weeds. Pesticide companies don't give growers enough information on choosing the right adjuvant. Most adjuvants have only one function, such as wetting the leaf surface of the plant or

(Continued on page 2)

(Continued from page 1)

weed, and the grower is left with minimal adhesion to keep the herbicide on the leaf surface to weather the elements. There aren't many "multi-functional" adjuvants with which to choose. Listed below are the types of adjuvants that are good for only one function. Growers must have a better choice than any one of the following:

- Non-ionic 80/20-Type** - These types of adjuvants are usually a blend of nonionic surfactants and glycol which is used as an inexpensive carrier for the surfactant. This adjuvant just wets leaves.
- Silicone and Silicone Blends** - These types of adjuvants are called "Super Wetter's" because that is what they do. They also can wet too well and slide off leaves. Used with some herbicides at temperatures above 90°F has shown plant burn and stomata fungus invasion.
- Methylated Seed Oils (MSO)** - They usually contain 80-90% soybean or vegetable oils and 10-20% emulsifiers/wetter, which are needed just to make the product usable. They are a cheap version of an adjuvant and generally only do one thing...oil the leaf surface. Many MSO's cause phytotoxicity, or harm to plants, while trying to assist in helping kill weeds or disrupt insect patterns. MSO's will wash off quickly with irrigation and rain.
- Crop Oil Concentrates (COC)** - are usually mineral or hydrocarbon oils. They have the same function in the spray tank as that of MSO's, but can be even more phytotoxic.
- Spreaders and Stickers** - Generally they come in a one-mix package or can be individually sold. They are high concentrations of surfactants (soap-type) and/or sticking agents (latex-resin-oils). They only provide single or double functionality at best. These products need to be highly concentrated, since they significantly require more active ingredients to get the desired effect on weed or plant surfaces.
- Penetrants** - are added agents to an adjuvant product... such as adding isopropyl alcohol, or acetic acids or other solvents, to assist the pesticide in only penetrating the cuticle leaf layer. The problem with other adjuvants, the penetrant may cause phytotoxic effects to the desired plants when mixed with a pesticide.
- Acidifiers** - claim to be all that is needed in herbicide mixes...but all these products really do is reduce water pH. This is not enough to assist in controlling pests...(weeds, insects and fungus).

HOOK is the Right Adjuvant to Choose

HOOK is "The Multi-Functional" adjuvant to choose for assistance in herbicide control of resistant weeds.

HOOK is a reacted polymeric adjuvant product designed with multi-functional properties which include Leaf Wetting

and Spreading/Sticking that is needed with pesticide spray applications to control resistant weeds. In addition, HOOK's polymer and leaf penetrating agents are designed to not cause phytotoxic effects on plant surfaces, allowing the plant to maintain good health during critical growth stages.

HOOK does not contain those MSO formulation ingredients... and does not burn plants when used according to label directions.

HOOK provides Drift Control. Addition of HOOK to the herbicide spray tank keeps the spray droplets in the desired particle size range for effective drift control.

HOOK tank mixes with all herbicides. When sprayed onto plants and weeds, HOOK allows the spray to completely cover, stick and penetrate the leaf surface and plant canopy, improving the herbicides ability to control and kill resistant weeds, without adding injury to the crop.

HOOK also is the only adjuvant to choose in assisting herbicides in spring and fall Burndown applications.

Foliar Fertilizer & Adjuvant Addition to Assist in Weed Control

Adding foliar fertilizer to the tank mix with the herbicide and adjuvant can increase weed kill. Tests with glyphosate and adjuvants plus a foliar fertilizer can increase weed control by as much as 30%. We know that leaf surfaces have cuticles that are like tunnels which allow herbicides, adjuvants and foliar nutrients to move throughout the surface. As plant stress increases, the tunnel opening decreases in the cuticles. Adding foliar fertilizer/adjuvant mixture pesticide tank mixes effectively gets into those reduced cuticle openings, allowing for pesticide activity to continue while reducing plant stress with nutrient mobility.

Mic-Ro-Pac is an effective foliar fertilizer packed with micro-nutrients. Used in combination with HOOK in the herbicide spray tank assists in providing the consistent performance needed to control resistant weed populations. **Mic-Ro-Pac** is also has Water Conditioning properties with a pH range of 5.5 - 6.3 that aids in achieving the optimal pH range of the final spray tank mixture. **Mic-Ro-Pac** in the tank mix gives a nutrient feeding to the crop and is also used in heat and chemical stressed situations where "crop-comeback" is essential for crop health and increased profits.

Using HOOK & Mic-Ro-Pac with your late fall and early spring herbicide applications ensures effective weed control of those resistant weeds.

Read all product labels before use, and follow pesticide labels as directed.

Vol 11, # 1