By Using Quality Adjuvants, Herbicide Rates, Costs Can Be Reduced

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HOLTWOOD (Lancaster Co.) — Pesticide applicators may be able to save as much as $8-$9 per acre on herbicide costs by using quality forms of adjuvants, according to information provided during a field day held at the Steve Groff Farm last week.

About 15 farmers and agri-industry representatives viewed the test plots on Groff's 175-acre vegetable and cash grain crop farm.

Sponsored by Groff, the Pennsylvania Association for Sustainable Agriculture (PASA), and Agri-Basics Soil Service, the field day showed how using adjuvants can contribute to weed reduction and improved stand on no-till corn.

In a summary provided at the field day, Groff stated, "I know that chemical companies spend millions of dollars to come up with acceptable rates for their products. I feel that with a little common sense and a few other tools such as adjuvants and proper timing, you can cut herbicide rates and reduce costs."

Adjuvants are applied with the herbicide at spray time to do a number of things. They vary by type and include:

• Compatability agents. These adjuvants help certain herbicides combine to promote improved effectiveness.

• Buffering agents. These lower or raise the pH of the water in the spray tank to make the herbicide more effective.

• "Applicator" or "sticker" adjuvants. These allow the pesticide to adhere more precisely to the leaf surface in post-emergent applications.

• Surfactants. These decrease the "surface tension" of the water. This tension makes the water "bead up" on the leaf surface. The adjuvant spreads the water out over leaf surface and also helps distribute the herbicide over a wider area and with more penetration in the soil.

Groff used APSA-80, an adjuvant available from Amway. With no-till corn, Groff indicated he had "good success" with the early preplant program, spraying 2-3 weeks before planting. On a fact sheet, records indicate that he sprayed 1.25 quarts per acre of Bicep with the adjuvant the first week of April, then planted the last week in April. He then followed up with 1 quart of Prowl as corn emerged to kill lambsquarter.

By spot-checking the fields at the beginning of the season, Groff said it looked like using the adjuvants helped.

"That was the intent of this project," he said. "What we're doing is making the herbicides more active in the soil."

Through calculations supplied by Groff and PASA, on plots 1-6, rates of Bicep were cut in half, from 2 quarts to 1 quart, reducing costs from $14.55 to $7.25 per acre. The rates of Prowl were cut from a quart to a pint, from $5.96 to $2.98 per acre. The adjuvant was supplied at a rate of 5 ounces per acre at a cost of $1.15 per acre.

On plots 7-10, Bicep rate was cut from two quarts to about 1.25 quarts per acre. Adjuvant was applied at the same rate.

Using the dual herbicides, savings came to $9.13 per acre.

Groff cautioned that there was more to the equation than simply the adjuvants. Another factor included the timing of the herbicide (he said he applies the chemicals right before a rain). "It has a lot to do with management," he said.

Also, choosing a quality adjuvant is essential. Some adjuvants include alcohol as a stablizer. But a quality adjuvant will have the adjuvant material at about 80 percent or more of the active ingredient.

Farmers can profit from trials such as these. Savings can be substantial.

"An $8 savings per acre, I think, is worthwhile talking about," said Edgar Rits, a consultant from Honey Grove at the field day. "That's less herbicide you need to put down. That's the big issue."

Harvest data on the corn yields as a result of using the adjuvants will be provided in the fall.

Groff said that about 75 percent of his corn is in no-till and the rest in slit till. A rotation of his corn every two years at maximum also helps to cut down the incidence of weeds and insects.

"I generally don't have a problem with insects in corn because of rotation," he said.

Other studies included the use of calcium with the spray, which had little effect on weeds and showed a slight adjustment of the pH. What Groff found is that water pH will directly affect the performance of the herbicides.

"It would be good if you would check the pH of your water," he said. He spoke about a chart that lists the most effective pHs for several different types of herbicides. "There is a difference," said Groff, indicating that some require a neutral pH and others require more acidic levels.

For atrazine-based herbicides, the half-life at a water pH of 8 is only a half hour. But a a pH of 5 or 6, the half-life extends to 8 or 9 hours. It's not uncommon to get a 7 or 8 pH in water supplies.

Other fields include corn incorporated into oat stubble in reducing herbicide use. The oat material stopped the weeds, according to Groff.

Dramatic results were achieved after a hay field was plowed in the fall and only harrowed to two inches deep in the spring. The fall plowing got rid of the weeds that germinated, cutting off seed production. A light disc harrowing in the spring only removed the seeds that sprouted on the top.

"An $8 savings per acre, I think, is worthwhile talking about," said Edgar Rits, a consultant from Honey Grove, left. He reviews application information with Steve Groff.

There are no weeds where the tomatoes are growing.

"I credit it to the fact that it was plowed in the fall," he said. "We took care of it by harrowing twice."

Groff said that it "really pays to plow in the fall for late-planted tomatoes. We've just had no weed problems.

"You have to try this yourself on your own farm," said Groff. "I think that's what this demonstration shows — there are some things you can try on your own farm and tell people about."

No 'Magic Bullet' In Controlling Weeds In Herbicides

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LANDISVILLE (Lancaster Co.) — There may be no "magic bullet" to take care of all a farmer's long-term weed problems in soybeans, especially in reduced tillage situations.

But that doesn't stop many manufacturers of herbicides and seed varieties from at least trying.

One attempt is being made by a manufacturer, Monsanto, to develop a variety of soybean that is resistant to its own herbicide, Roundup. Research is under way at Penn State to study how effective the new biogenetic gene is to not only the Monsanto herbicide, but to a variety of other herbicides from other manufacturers.

More than 100 agri-industry representatives were on hand to see some results of this and other soybean and corn herbicide trials conducted at the Penn State Landisville Research Center during the annual Weed Tour on Thursday morning.

Dwight Lingenfelter, Penn State graduate student and extension assistant, spoke about the effectiveness of Roundup for perennial weed control in transgenic soybeans. He said the trials are looking at long-term control of the warm season perennial weeds, such as hemp dogbane, Johnsongrass, bindweed, and others.

Conventional tillage has helped control weeds. But with conservation compliance, reduced tillage is necessary, which has presented unique problems for growers in controlling weeds.

For reduced tillage, postemergent herbicide treatments are necessary, especially the grasses. But for most applications, the solution only lasts one season, not long-term.

"Effective control programs do not exist," said Lingenfelter. "We need long-term management for rotational crops."

While there is no magic bullet to solve long-term weed problems, a concerted effort involving the right soybean variety, good herbicide treatment, timing, and rotation can go a long way, according to the graduate student.

Other herbicides compared in the long-term Penn State study, at Landsville and at Rockspring, will look at a variety of other herbicides with the new variety. According to Bill Curran, assistant professor, weed science, the new Monsanto variety won't be available for commercial use until at least 1996.

"We need this research in order to better utilize effective control measures and, for the importance of conservation compliance, it's necessary to integrate weed control approaches in order to manage these problem weeds we have," said Lingenfelter. These methods include "biological, chemical, mechanical," and other means.

Canada thistle is a predominant weed in soybeans, according to Curran. Curran provided detail about reduced herbicide treatments at various timing and incorporation rates, including using diphenyl ethers for broadleaf weed control, for treating thistle and other broadleaves.

Corn herbicide treatment information was not observable at the field day because of severe weather the night before. Wind damage cut corn standability by up to 10 percent in one field at the research center, sheering off stalks. In one plot, a power line went down.

John Yocum, manager of the research farm, spoke about studies that proved that weed germination in full-season beans peaks about the first week of June. But one finding was that there was considerably less weeds in no-till ground than in conventionally tilled soil. But stands depend on a lot of factors, including the weather and other conditions.

Also, research continues to indicate that without a canopy, and with sunlight hitting the soil surface, according to Yocum, producers are losing yield on soybeans.

Also at the field day, Ed Werner, Penn State research technician and graduate student, spoke about his work with a weed economic threshold study in corn. Rob Parks, graduate research assistant, agronomy, spoke about his work on trials involving triazine-resistant lambsquarters, the most common annual broadleaf in the state.

Dwight Lingenfelter, Penn State graduate student and extension assistant, spoke about the effectiveness of Roundup for perennial weed control in transgenic soybeans. He said the trials are looking at long-term control of the warm season perennial weeds, such as hemp dogbane, Johnsongrass, bindweed, and others.