



Sulfonylurea Herbicides: Importance and Use in the Southwest
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Summary

Certain sulfonylurea herbicides, including metsulfuron-methyl, thifensulfuron and tribenuron, are used on a variety of crops in the desert southwest, with wheat and barley being among the most significant uses in Arizona and Colorado. Wheat growers and pest control advisors (PCAs) in Colorado and Arizona expressed concerns with several of EPA's proposed label changes.

- Products used in wheat in Arizona and Colorado currently provide good to excellent weed control at an affordable cost.
- The proposed label change requirement for coarse droplet sizes will reduce coverage and thereby will likely reduce product efficacy.
- As currently used, these products help reduce reliance on glyphosate and are part of glyphosate resistance management practices.
- Resistance monitoring requirements as stated in the PID are impractical and would be costly and difficult to implement.
- Growers are aware of potential drift concerns and already implement practices to reduce risks of drift.
- There is concern that registrants may opt to cancel registrations of sulfonylurea products rather than invest in research to provide new efficacy data.
- The potential economic impact of losing access to, or the practical and effective use of sulfonylurea herbicides, could be very significant for a number of reasons documented below by Colorado wheat growers.
- In some geographic areas, implementation of the requirement of wind speeds not greater than 10 mph during application could be problematic due to typical weather conditions during normal window of application.

- Dust particle drift can certainly be an issue in Arizona because of our desert conditions. Label restrictions in this regard would hopefully take into account environmental conditions related to particle drift that vary from state to state.

Who We Are

The Arizona Pest Management Center is host to the University of Arizona's expert IPM scientists including Ph.D. entomologists, weed scientists and plant pathologists with expertise in the strategic tactical use of pesticides within IPM programs that protect economic, environmental and human health interests of stakeholders and the society at large.

Dr. Peter Ellsworth is Director of the APMC, State IPM and Pesticide Coordinator for Arizona and Professor of Entomology / Extension IPM Specialist with expertise in developing IPM systems in cotton and other crops and measuring implementation and impact of IPM and pest management practices. Dr. Al Fournier is Associate Director of the APMC / Adjunct Associate Specialist in Entomology, holds a Ph.D in Entomology, and has expertise in evaluating adoption and impact of integrated pest management and associated technologies. He serves as a Comment Coordinator for the Western IPM Center, representing stakeholders in the desert Southwest states. Barry Tickes is weed scientist and Area Agricultural Agent and County Director in western Arizona. Mr. Wayne Dixon holds a B.S. in Computer Information Systems and develops tools and data used in IPM research, education and evaluation, including management of the APMC Pesticide Use Database.

These comments are the independent assessment of the authors and the Arizona Pest Management Center as part of our role to contribute federal comments on issues of pest management importance and do not imply endorsement by the University of Arizona or USDA of any products, services, or organizations mentioned, shown, or indirectly implied in this document.

Our Data and Expert Information

Through cooperative agreements with Arizona Department of Agriculture, the Arizona Pest Management Center obtains use of, improves upon, and conducts studies with ADA's Form L-1080 data. Growers, pest control advisors and applicators complete and submit these forms to the state when required by statute as a record of pesticide use. These data contain information on 100% of custom-applied (i.e., for hire) pesticides in the state of Arizona. Grower self-applied pesticide applications may be under-represented in these data. In addition, the Arizona Pest Management Center is host to scientists in the discipline of IPM including experts in the usage of this compound in our agricultural systems. We actively solicit input from stakeholders in Arizona including those in the regulated user community, particularly to better understand use patterns, use benefits, and availability and efficacy of alternatives. The comments within are based on the extensive data contained in the Arizona Pest Management Center Pesticide Use Database, collected summary input from stakeholders and the expertise of APMC member faculty.

Arizona Use

A number of sulfonylurea herbicides are used in a variety of Arizona crops, with the most significant use on corn, grasses, forage and grain crops (Tables 1 & 2). In recent years, the most significant use pattern is on wheat and barley.

According to Barry Tickes, Weed Scientist and Area Agricultural Agent in western Arizona, thifensulfuron is an excellent broadleaf herbicide in wheat. Currently it is available in Dupont Affinity, pre-mix product, along with another sulfonylurea, tribenuron. This product is widely used in wheat and to a lesser extent in barley. The tribenuron component does not improve control, but increases the potential for plant injury.

According to a central Arizona pest control advisor (PCA) who works in wheat and other crops, “Dupont Affinity is one of the few herbicides we have that is effective in wheat. We generally apply it in mixtures with other products. It is one of the most effective products we have, and at a reasonable cost. There are not many broad leaf herbicides available to us. We used to put a lot of harsh chemicals out. But this type of herbicide is safer for the environment and people than what we used to use. We have improved our practices a lot over the past 15 years, and are using far less chemicals and safer ones.” A second PCA also from central Arizona reported that Dupont Affinity offers a good spectrum of broadleaf weed control in wheat, controlling thistles, *Malva*, mustards and other problem weeds. It is also cost effective.

An Arizona wheat grower who reviewed EPAs proposed label changes was not concerned about the coarse droplet size or other application requirements, indicating that he believed the products will still be effective under those conditions. He was supportive of a label requirement to apply at wind speeds not exceeding 10 mph, saying there is no harm in making all applicators well aware of potential drift concerns. “We are very sensitive to concerns about drift in our operations. We make the pilots we work with aware of other crops in the area and develop application plans that are very specifically designed to reduce the probability of off-site drift. The aerial applicators are very conscious of wind conditions and always make a trial pass before each application to test for drift before they release any pesticides on the site.” He added that the sulfonylurea herbicides are very important in broadleaf weed control in wheat, and that they would not want to lose the ability to apply the herbicides aerially. He did express concern and some confusion about the proposed requirement for end users to monitor weeds before and after treatment and to report any potential resistance concerns. “We are well aware of the potential for resistance and pay careful attention to how well our management tools are working. However, it is beyond practicality to presume we could actively scout all areas of the field before and after each application. We simply don’t have the time or manpower to do that.” He added that the guidelines on this requirement seemed vague and unclear. Dust particle drift can certainly be an issue in Arizona because of our desert conditions. Label restrictions in this regard would hopefully take into account environmental conditions related to particle drift that vary from state to state. Finally, he expressed some concerns about the requirement for registrants to compile data for each AI to help EPA assess pollinator risks.

Obviously, these studies will take time and he would not want to lose access to this important weed management tool in the interim, or in perpetuity should registrants find it more economic to eliminate some of these products than to conduct additional required studies.

Colorado Use

A prominent wheat grower in Northeast Colorado provided the following comments on EPA's proposed label changes for the sulfonylurea herbicides. Several of EPA's proposed label changes and new application requirements would have a significant negative impact on the ability of Colorado wheat producers to control weeds and produce a profitable crop. In Northeast Colorado, Dupont Ally herbicide or generic equivalents (containing metsulfuron-methyl), are a major component of weed control programs, along with Dupont Affinity and Harmony Extra (both containing thifensulfuron and tribenuron-methyl), which are used to a lesser extent. Dupont Ally provides good residual and is very affordable. We typically apply these products in April and get very good residual weed control through the end of the season. It is mainly used in tank mixes such as with 2,4-D. Most applications in wheat are done with 0.10 oz / acre application rate in 5 gallons of water per acre, with flat fan nozzles applied at 40 lbs. of pressure. This produces a medium droplet size rather than the extremely coarse droplet size that would be required under proposed label changes. **This coarser droplet size will negatively impact efficacy because it will not be possible to get adequate coverage to ensure effective weed control.** Under these requirements, Dupont or other affected registrants may need to re-evaluate whether it would be worthwhile to invest in research to provide new supporting efficacy data, and if they did, it could take years to develop. **Frankly, under these restrictions, it seems unlikely that these materials would continue to be efficacious or cost-effective for weed control in wheat in Colorado.**

Other elements of the proposed label changes also raise concerns for our growers, such as the requirement of wind speeds below 10 mph. Days with winds below 10 mph when products are typically applied in April are rare in our part of Colorado. EPA is also proposing that users scout for weeds before and after application and report any field failures or potential resistance concerns. Realistically this does not seem likely to happen in our area. For one thing, growers and applicators are hesitant to voluntarily report information to EPA, but also there are serious time constraints involved.

Taken in combination, the proposed label changes would effectively shut down the use of these herbicides in CO wheat, with grave economic outcomes for growers. **The potential economic impact of losing access to, or the practical and effective use of sulfonylurea herbicides on Colorado wheat growers cannot be overstated.** Currently, we spray once in early April and the residual activity maintains a clean wheat field until harvest time. Implementing these changes will result in added costs for application equipment, added labor costs due to changing out nozzles, loss of effectiveness due to the droplet size issue, and the need to shift to more expensive and potentially less effective products. We simply do not have many other options for effective preventative weed control. If these proposed changes are adopted, we can

anticipate higher weed management costs combined with less effective weed control, leading to greatly reduced yield, and also losses of quality that will negatively impact growers' bottom line. In Northeast CO, we normally average about 45 bushels per year. A weedy wheat field reduces that yield, and has negative impacts on quality that reduce the crop's value. Weeds in the field at harvest time can make harvesting problematic. When you combine all of these factors, these changes could cost growers up to \$100 per acre.

A second wheat grower in southern Colorado, and member of the Colorado Association of Wheat Growers provided additional comments. When asked about the proposed label changes and their potential impact on wheat production, he expressed surprise because, in years of safe and effective use, they have not seen any issues nor had any complaints about drift with these herbicides. He sees these steps as entirely unnecessary, at least under their local conditions. They mainly use generic metsulfuron-methyl (MSM). The other sulfonylureas are not often used. This herbicide has some limitations, but it is effective. They are careful in how they use it, in part due to concerns of phytotoxicity with certain rotational crops, such as sunflower. In their high pH soils, the chemistry can remain active in the soil for a long time. In wheat it is generally applied with 2,4-D at low rates (0.05 oz per acre) and it definitely increases effective control of weeds such as puncturevine. It also helps to control weeds that are resistant to glyphosate. This makes it a good tool for resistance management, and they are mindful to use it in ways that help to ensure its continued effectiveness. For example, they have encountered populations of kochia (a very adaptable weed) that are resistant to 2,4-D, dicamba, and glyphosate. MSM is effective against this weed, and growers manage its use carefully to prevent the development of resistance to the sulfonylureas.

He echoed other grower's concerns about the implementation of a requirement for coarse droplet sizes. "This would reduce coverage and efficacy, and for what reason?" Drift simply is not an issue for them. Since good coverage is needed to be efficacious, he is concerned that Dupont or other companies may not continue to support these registrations and they will lose a very cost-effective tool for weed management in wheat.

Table 1: Arizona reported use (mean acres treated annually) of all sulfonylurea herbicides by crop, 2009 – 2015. Source: Arizona Pest Management Center Pesticide Use Database. *Note: not all uses are reported.*

CROP NAME	MEAN ACRES TREATED
WHEAT, UNSPECIFIED	11,186
BARLEY	3,833
CORN	1,108
CORN, FIELD	991
FALLOW OR IDLE LAND	710
POTATO	673
CORN, FIELD (SWEET)	560
GRASS, BERMUDA	557
GRASS, UNSPECIFIED	501
GRASS, TURF	470
GRASS, BERMUDAGRASS	454
CORN, UNSPECIFIED	423
MILO	378
FORAGE, UNSPECIFIED	298
CORN, GRAIN	217
ALFALFA	169
WHEAT, DURUM	162
CORN, SEED	145
OAT	130

Table 2: Arizona reported use (mean acres treated annually) of sulfonylurea herbicides by active ingredient, 2009 – 2015. Source: Arizona Pest Management Center Pesticide Use Database. *Note: not all uses are reported.*

ACTIVE INGREDIENT	MEAN ACRES TREATED
TRIBENURON-METHYL	8,527
THIFENSULFURON	6,345
MESOSULFURON-METHYL	1,375
RIMSULFURON	867
METSULFURON	525
NICOSULFURON	515
CHLORSULFURON	468
TRIFLOXYSULFURON-SODIUM	330
HALOSULFURON-METHYL	201