



Pendimethalin Use in Arizona and New Mexico Crops
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Summary

- EPA is seeking public comments on draft human health and ecological risk assessments for pendimethalin, a versatile and broadly used herbicide that is registered on many different crops in the desert southwest.
- At this time, our goal is to inform EPA about a few of the specific uses of pendimethalin in our cropping systems.
- Pendimethalin is a versatile and effective herbicide used across a broad range of crops in the desert southwest. Given time constraints on developing these comments, we provide just a few examples of effective and important use patterns for pendimethalin in Arizona and New Mexico.

Pendimethalin use in Arizona

Based on data from the Arizona Pest Management Center (APMC) Pesticide Use Database (Fournier et al. 2017), pendimethalin has reportedly been used on over 50 crops in Arizona during the past eight years. Nearly 70,000 acres of crops were reportedly treated in 2016 alone, but this is a conservative estimate of actual use, because most grower-applied herbicides do not require reporting in Arizona. The most significant uses in Arizona, in terms of reported acres treated, include alfalfa, cotton, and wheat. Among our smaller acreage crops, there are reported uses in corn, peas, blackeyed peas, garbanzo beans, onions, garlic, broccoli, carrots, watermelon and other melons, pecans, potatoes, citrus, peppers and other crops. There are also uses in seed crops (e.g., onions) and on fallow land.

Two pest control advisors (PCAs) in central Arizona indicated that pendimethalin use is a foundational practice of weed management programs in cotton, alfalfa, carrots, sweet corn and melon production, among many other crops in the state. “There are a lot of weed control programs in Arizona built around this flexible and efficacious herbicide.”

Alfalfa, Cotton and Wheat

Pendimethalin is an important component of weed control and weed resistance management programs in Arizona. In terms of reported acres treated, our highest uses are in alfalfa, cotton and wheat, and in these crops, pendimethalin forms a cornerstone of weed control programs for many of our growers.

In 2016, Arizona growers produced 280,000 acres of alfalfa, over 2.4 million tons, valued at over \$361 million (USDA-NASS 2017a). Several pyrethroid active ingredients are among the most commonly used insecticides in alfalfa. According to the Arizona Pesticide Use Database (Fournier et al. 2017), over 51,000 acres of alfalfa were reportedly sprayed, representing close to 20 percent of acres reported harvested, according to USDA-NASS 2017a. However, because growers in Arizona are not required to report most herbicide applications that they make “in-house” (as opposed to custom-applied applications made on a for-hire basis), we believe this is a significant underestimate of actual use.

Arizona often leads the world in cotton yield per acre (>1550 lbs.), nearly twice the U.S. average, contributing 9,000 jobs and \$700 million to Arizona’s economy in 2011 (Anonymous 2012). In 2016, cotton was ranked third for production value in Arizona, after lettuce and alfalfa hay, with a combined value of over \$162 million for cotton and cotton seed production (USDA-NASS 2017a). According to one pest control advisor (PCA) in Arizona, “pendimethalin is a foundational practice for use in cotton and alfalfa as well as other crops. A lot of weed control programs are built around it.” In addition, according to University of Arizona Extension Weed Specialist, Dr. William McCloskey, Pendimethalin is critical to the management of glyphosate and pyriithiobac resistant *Palmer amaranth* in cotton.

In 2016, Arizona produced over 10 million bushels of wheat valued at nearly \$66 million, most of it high-value durum wheat for the export market used in pasta. (USDA-NASS 2017a). According to pesticide use reports, a smaller percentage of wheat acres than alfalfa or cotton reportedly are treated with pendimethalin (Fournier et al. 2017), but it is an important option for our growers and a rotational tool in weed resistance management programs.

Melons

Arizona produces fresh market cantaloupe and watermelons. In 2016, over 20,000 combined acres harvested were valued at over \$98 million (USDA-NASS 2017). More than half of Arizona’s melons are grown using plasticulture, a practice of covering beds with plastic. Because of this practice, broadcast sprays of herbicides are not used, and physical incorporation of herbicide into the soil is not possible. Pendimethalin H₂O is sprayed on the shoulders of soil placed over the edges of the plastic, and offers effective weed control in melons. Pendimethalin is the only herbicide available for this use pattern in Arizona.

Other crops

One PCA we spoke with emphasized the importance of pendimethalin in carrot production. “We use Prowl H₂O in carrots. It is very effective and is critical to our weed management programs. Treflan is the only other pre-emergent available to us. Pendimethalin provides a good alternative to rotate with treflan, for resistance management, and it is the more efficacious of the two.”

Yet another PCA said of pendimethalin, “We use it a lot in citrus, cotton and alfalfa. We introduced Prowl H2O in cole crops last year, and found that it is very effective.”

University of Arizona Extension Weed Specialist, Dr. William McCloskey, is currently conducting research to gather data for registration and developing a use pattern for Prowl H2O in Arizona Chile peppers.

Pendimethalin use in New Mexico

Chile Peppers

In 2016, New Mexico produced 8,700 acres of Chile peppers valued at over \$50.5 million (USDA-NASS 2017b). According to a pest management advisor who works with the NM Chile industry, “Pendimethalin use is standard for us in Chile pepper production. Prowl is applied immediately after planting, then we use a cultivator to push the soil up on the sides of the bed, with prowl incorporated. This practice very effectively suppresses weed growth and is more sustainable and also more economical for growers than broadcast spraying. We use a single full-rate application. We only use it once because there is a 70-day pre-harvest interval. It would be very problematic for us if this use of pendimethalin was lost.”

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. Dr. William McCloskey is an Associate Professor and Extension Specialist in Weed Science, with experience in field crops, including cotton, and tree fruit and nut crops. 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.

References Cited

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