Agricultural Experiment Station
Cooperative Extension

37860 West Smith-Enke Road
Maricopa, Arizona 85138
(520) 374-6200

Atrazine: Proposed Revisions to the Interim Registration Review Decision

Prepared by Alfred Fournier, José Dias & Wayne Dixon
Comments submitted by the Arizona Pest Management Center,
University of Arizona

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The EPA is seeking public comments in response to a memorandum on proposed revisions to the Interim Registration Review Decision for Atrazine. We wish to respond to the Agency's open comment period with information on use patterns for atrazine in Arizona and potential impacts of these revisions on Arizona growers. Our comments combine stakeholder input received from University of Arizona Extension Specialists, licensed pest control advisors, and reported pesticide use data from the Arizona Pest Management Center Pesticide Use Database.

Atrazine Use in Arizona Crops

Because Atrazine is on the Arizona Department of Environmental Quality's Ground Water Protection list, both commercial and grower-applied uses require reporting to the Arizona Department of Agriculture and are captured in the Arizona Pest Management Center database (Fournier et al. 2017). This represents 100% of uses. Atrazine is used primarily on corn and sorghum in Arizona. It can be applied both as a pre-emergent or early post-emergent product in corn or sorghum. The majority of atrazine is applied by ground in both crops. Atrazine is applied either pre-emergence, or post-emergence when the crop is young. Sometimes growers will apply by air if they miss the early application window, but this is not very common.

According to licensed Pest Control Advisors (PCAs) familiar with its use, atrazine and provides effective control of certain challenging weeds, and is very affordable to use compared to other herbicide options. When applied post-emergent, some PCAs report that a single application of atrazine provides effective control for the length of the crop cycle. Some growers typically use two applications of atrazine at the maximum single use rate of 2 lbs ai/A on some of their acres. However, this appears to be minority practice. Some PCAs report using less atrazine in recent years, mainly because it is not as efficacious as it once was across a broad spectrum of weeds.

Alternatives to Atrazine
Based on input from several PCAs, alternative herbicides for pre-emergent applications include Warrant (acetochlor) and Callisto (mesotrione); post-emergent alternatives include a fair amount of dicamba, usually mixed with Aim (carfentrazone-ethyl) or ET (pyraflufen ethyl). The product Status (dicamba+diflufenzopyr) is available for use in corn up to 36 inches in height, or 16 or more days before tassel emergence, whichever comes first. It is not registered for use in sorghum.

PCAs working in some areas of the state claim that atrazine at full rate is the most effective treatment for morning glory, glyphosate-resistant pigweed, and a few other difficult-to-control weeds. Furthermore, they point out that many of the alternatives have longer, sometimes very long, plant-back restrictions, in addition to being more expensive. This makes them difficult or impossible for growers to use, based on crop rotations and planting schedules. Atrazine is also among the least expensive herbicides available. Some newer herbicides in corn, for example, are effective, but cost $40 to $50 per acre, compared to atrazine which is $6 to $7 per acre, according to one PCA.

Response to Proposed Revisions to Interim Decision

Mitigations Proposed for Atrazine Labels
EPA is proposing the following measures for all atrazine labels in order to decrease atrazine runoff from treated fields:

1. Prohibit application when soils are saturated or above field capacity (i.e., the soil's ability to retain water)
2. Prohibit application during rain or when a storm event, likely to produce runoff from the treated area, is forecasted to occur within 48 hours following application
3. Prohibit aerial applications of all formulations

EPA also proposes to:

4. Restrict annual application rates to 2 lbs. active ingredient or less per acre per year for applications to sorghum, field corn, and sweet corn

The first two restrictions are expected to have no impact on Arizona growers. Because of arid conditions, fields here do not reach saturation levels. In fact, great pains are taken to conserve water and to direct it to where the plants can use it. Runoff is minimal, if not unheard of, due to laser-leveling of all agricultural fields in Arizona and throughout many areas of the West. With new water restrictions in place in some areas of the state, this is truer than ever.

Aerial Applications
The majority of atrazine is applied by ground in Arizona. Based on an analysis of reported uses, 27.7% of all uses in corn and 28.1% of all sorghum uses from 2010 through 2020 were applied by air. However, examining only 2018 through 2020 data, the percent of aerial applications in recent years is much lower: 6.8% in corn, and 2.9% in sorghum. This is consistent with information from PCAs. One PCA indicated he does not apply atrazine (nor other herbicides) by air. Another indicated that about 95% of applications are made by ground. **We do not anticipate**

that the proposed prohibition on aerial applications for all crops and formulations would be a problem for our growers.

Annual Application Rates

EPA proposes restricting annual application rates to 2 lbs ai/A or less per year for applications to sorghum, field corn, and sweet corn. Our analysis of pesticide use data and information gleaned from PCAs suggest that these proposed changes would impact some growers, based on current practices.

It is common for growers in different regions of Arizona to double-crop, alternating between corn and sorghum, and some of these growers currently use a single application of atrazine in both crops. A PCA who works with these growers and is familiar with application rates suggested that **an annual maximum use rate of at least 2.9 lbs ai/A would be needed to sustain the practice of a single atrazine use in each crop at a rate high enough to provide effective weed control**. He noted that if EPA proceeds with the 2 lbs ai/A annual use limit, he will continue to use atrazine on sorghum and consider alternative products for corn, as there are "a few good alternatives" for that crop.

Some growers of corn and sorghum in the southeastern part of the state consistently rely on atrazine for weed control. According to two PCAs there, they do at times use the current maximum single use rate of 2 lbs ai/A, and furthermore, sometimes will make two applications at this rate. This is most likely to occur in fields where morning glory, glyphosate resistant pigweed or other particularly challenging weeds occur. EPA's proposed mitigation would limit these growers to a single application of atrazine at these rates, requiring them to seek alternative herbicides when follow up applications are needs. As noted above, **this would increase costs for growers significantly, and may leave them with limited alternative options that work with current growing schedules and rotations, due to longer plant-back restrictions on some of these labels.** There are more herbicide options available in corn than sorghum, where the restriction would be most problematic.

An analysis of single use rates for all atrazine applications on all types of corn and sorghum (2010-2020) shows that 7.1% of applications are made at the full rate of 2 lbs ai/A, and many applications are made near this rate. Only 30% of atrazine applications are at or below the 1lbs ai/A rate. This analysis suggests that 70% of applications are at rates high enough such that only a single use of atrazine would be allowed on an annual basis. The median use rate is 1.18lbs ai/A, and the mean rate is 1.15lbs ai/A.

It is clear from these findings that EPA's proposed annual use rate reduction will have significant economic consequences for at least a portion of Arizona sorghum and corn growers. It will limit their options for effective weed control, particularly for challenging weeds in some parts of the state, and alternative herbicide options will be limited due to current rotational practices and plant-back restrictions on the labels for many alternative herbicide options.

"Picklist" of Mitigations Practices

EPA is proposing to add a "picklist" to labels that would require growers to select a combination of application rate reductions and/or runoff control measures when using atrazine in watersheds with atrazine concentrations that exceed the Concentration Equivalent Level of Concern of 3.4 µg/L. These proposed restrictions are not expected to apply to Arizona or the Desert Southwest growers, the best that we can discern, based on maps posted online that highlight locations of problematic watersheds, primarily in the Midwest, Upper Midwest, Mississippi River Valley, areas of Texas, and limited areas from New England states, through the Mid-Atlantic, and in Southeastern states (O'Connor 2022). **Our recommendation is that EPA make it very clear on labels to which regions of the country the Picklist mitigations are expected to apply.**

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. In coordination with the Western Integrated Pest Management Center, we contribute to federal comments on issues of pest management importance to stakeholders throughout the desert southwest including Arizona, New Mexico, Nevada, Colorado and the southeast desert regions of California.

Dr. Alfred Fournier is Associate Director of the APMC / Associate Specialist in Entomology, and has expertise in evaluating adoption and impact of integrated pest management and associated technologies. He serves as a Southwest Region IPM Network Coordinator for the Western IPM Center, representing stakeholders in the desert Southwest states. Dr. José Dias is Assistant Professor and Extension Weed Scientist in the School of Plant Sciences at University of Arizona, based at the Maricopa Agricultural Center. He works with producers throughout the state on weed management, resistance management, genetic technologies and other issues. 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

Fournier, A., W. Dixon, P.C. Ellsworth. 2017. Arizona Pest Management Center Pesticide Use Database. University of Arizona Cooperative Extension.

O'Connor, B. 2022. EPA Accepting Comments on Atrazine Rule Changes Until October. Strip-Till Farmer. https://www.striptillfarmer.com/articles/4387-epa-accepting-comments-on-atrazine-rule-changes-until-october