Agricultural Experiment Station
Cooperative Extension

37860 West Smith-Enke Road
Maricopa, Arizona 85138
(520) 568-2273
FAX: (520) 568-2556

Response to EPA Call for Comment on Sulfoxaflor Registrations on Certain Crops
Prepared by Alfred Fournier and Peter C. Ellsworth
Comments submitted by the Arizona Pest Management Center
University of Arizona

Date: March 27, 2023
EPA Docket ID: EPA-HQ-OPP-2010-0889-0659
Re: Pesticide Product Registration: Sulfoxaflor

To Whom It May Concern:

The EPA has opened this opportunity to comment on a number of registered uses of sulfoxaflor, based on a requirement from the Ninth Circuit Court of Appeals, in response to petitioners. We take this opportunity to respond to EPA on the importance, safety and benefits of sulfoxaflor use on a number of agricultural crops in Arizona and adjacent regions of Imperial and Riverside Counties, California, as well as New Mexico.

> "After conducting an extensive risk analysis, including review of one of the agency's largest datasets on the effects of a pesticide on bees, the Agency restored the 2015 vacated uses in 2019 on: citrus, cotton, cucurbits, soybeans, strawberry. The Agency also removed the following 2016 mitigations in 2019: A 12 foot on-field aerial buffer; prohibition for use on crops grown for seed; removal of the tank mix restriction; removal of restrictions limiting use to post-bloom applications on berries, canola, okra, ornamentals, pome fruit, potato, stone fruit, fruiting vegetables, nuts, succulent and dry beans."
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> —From EPA Notice, EPA-HQ-OPP-2010-0889-0659, Federal Register, Feb 23, 2023

Regarding EPA's request for comment on sulfoxaflor, we acknowledge that the Agency has conducted one of the most exhaustive reviews of the effects of sulfoxaflor on bees. Our real-world usage of sulfoxaflor on a number of desert southwest crops, including cotton, revealed no special concerns or considerations with respect to honeybee health or their populations. On the contrary, through sulfoxaflor's role as an organophosphate replacement, we have nearly eliminated all use of acephate to control Lygus, the number one yield-limiting insect pest of cotton. Acephate was a particular hazard for bees and other pollinators, and in addition, its broad-spectrum activity effectively eliminates the in-field predators and parasitoids on which our integrated pest management (IPM) system depends.

As a result of the 2015 vacated uses, our growers were forced to re-consider broadly toxic organophosphates and pyrethroids again for pest control. In 2017 we sought and were granted a Section 18 specific use exemption for cotton in order to overcome this non-routine and emergency condition caused by loss of access to sulfoxaflor (Ellsworth & Peterson 2017). Our growers returned to the safe use of sulfoxaflor, restoring our ability to actively manage Lygus while protecting key predators and other natural enemies in our system. The restoration of the former label for cotton in 2019, including removal of excessive buffers for aerial application and prohibition on tank mixing has removed the uncertainty growers faced about the availability of this otherwise very safe insecticide.

Sulfoxaflor has been critical to the success in cotton IPM that our growers practice today. In 2022, cotton growers sprayed just 1.53 times for all arthropods pests. About 90% of those sprays were with fully selective insecticides like sulfoxaflor, which are protective of non-target species including the natural enemies we seek to conserve in our cotton fields. Lygus is the number one yield-limiting pest of cotton in Arizona and was sprayed 0.97 times in 2022, of which about half of those sprays were with sulfoxaflor (Ellsworth, unpublished. Cotton Pest Losses survey data).

The Arizona Pest Management Center strongly supports EPA's 2019 Decision Memorandum for sulfoxaflor, which included registering new uses and label amendments. As the agency moves forward in complying with the present court order, we ask that our comments and those of Arizona Farm Bureau be considered in the process, and generally support retention of all the new uses and label amendments in the 2019 Decision Memorandum for sulfoxaflor.

Previous EPA Comments and Special Registration Requests for Sulfoxaflor

In the past, we have commented extensively on sulfoxaflor, including uses in vegetable crops, melons, and cotton. We wish to incorporate by reference the previous comments to EPA listed below, as well as our Section 18 request for use of sulfoxaflor in Arizona cotton, which contains relevant information on its utility, safety and nontarget effects. We also wish to endorse comments submitted by the Arizona Farm Bureau Federation in response to this notice.

Fournier, A.J., P.C. Ellsworth, J.C. Palumbo, A. Mostafa, W.A. Dixon II. 2022. In Response to EPA Draft Biological Evaluation for Sulfoxaflor & Mitigations Proposed by the Registrant. Docket ID: EPA-HQ-OPP-2010-0889-0597. 9/17/22. https://acis.cals.arizona.edu/docs/default-source/ipm-assessment-documents/arid-swpmc-info-requests/comment-reponses/sulfoxaflor-dbe_9-17-22_vf2alo.pdf

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Palumbo, J.C. 2011. Re: Docket ID No. EPA-HQ-OPP-2010-0889. Undated letter to EPA submitted to the docket Jan 31, 2011. Professor and Extension Specialist, University of Arizona. Docket ID: EPA-HQ-OPP-2010-0889-0007. https://acis.cals.arizona.edu/docs/default-source/ipm-assessment-documents/arid-swpmc-info-requests/comment_palumbo_sulfoxaflor_2011.pdf

Sulfoxaflor Use, Safety, and Benefits

Sulfoxaflor is a key compound with detailed and rigorous research evaluations in Arizona cotton and vegetables demonstrating that it is safe and effective to use in Arizona agriculture. It provides for effective and selective control of Lygus bugs and *Bemisia* whiteflies in cotton, as well as whiteflies and aphids in produce and cucurbits (Ellsworth 2013). It controls aphids, thrips, mirids, and a variety of plant feeding insects across a broad range of crops in the Desert Southwest. Based on information from the APMC Pesticide Use Database, the most significant uses of sulfoxaflor in Arizona are in cotton, lettuces, spinach and other leafy greens, alfalfa, cole crops, and melons. It is also used to a lesser extent in sorghum, dry beans, chile peppers, peas, carrots, potatoes, wheat and barley, citrus, pecans and pistachios (Fournier et al. 2017). While some of these are small-acre crops in Arizona, sulfoxaflor often plays a critical role in insect pest management.

Sulfoxaflor provides cost-effective insecticidal activity against key sucking pests and has an excellent fit in our existing Integrated Pest Management (IPM) and Insecticide Resistance Management (IRM) programs in both cotton and produce. Sulfoxaflor is an excellent alternative to many older, higher risk, broad-spectrum compounds, including organophosphates (Ellsworth & Peterson 2017; Palumbo 2016). Sulfoxaflor uniquely controls both Lygus bugs and whiteflies without harming beneficials in cotton (Ellsworth & Peterson 2017; Bordini et al. 2021). Intensive

multi-year examinations in cotton and produce have demonstrated sulfoxaflor's selective activity and lack of impacts on non-target organisms. It has been successfully used for several years across hundreds of thousands of acres with no bee incidents reported (Ellsworth & Peterson 2017; Palumbo 2016). Sulfoxaflor provides a key alternative to flonicamid (Carbine) that has helped stabilize and sustain our resistance management programs for Lygus and whitefly (Ellsworth 2013).

Key points from prior comments and other sources

The information below is summarized from our prior comments. Please see citations and prior comments for additional data and figures.

Cotton

- In 2022, 101,400 acres of cotton (upland and Pima) was harvested throughout Arizona at a value of $122.4 million (USDA 2023a). Upland cotton in Arizona produces per acre yields larger than that of any other state or region of the world, while contributing over $700M annually to our state's economy (Ellsworth & Peterson 2017). Since the introduction of key technologies and IPM programs to support their use in 1996, we estimate cotton growers in our state have cumulatively saved over $600 million (Ellsworth & Fournier 2022).
- Sulfoxaflor is ideally suited for our cotton IPM system, where we have progressively introduced highly selective and effective technologies for the control of key insect pests, while conserving the natural enemy fauna present in the field and available for suppression of all cotton arthropod pests (Bordini et al. 2021; Ellsworth 2013; Ellsworth & Fournier 2022).
- Sulfoxaflor is the only product available with very high efficacy against Lygus bugs, suppression of whiteflies — and control of cotton aphids — without negative impacts on predators and other beneficials in the Arizona cotton system. Its multi-target effectiveness can reduce the number of total sprays required for economic production (Ellsworth 2013; Ellsworth & Fournier 2022; Fournier et al. 2022, Figures 1–4).
- Sulfoxaflor is among the most effective insecticides ever screened for the control of *Lygus hesperus*, a key mirid bug pest of cotton. Lygus bugs have been our number 1 yield-limiting pest of cotton since at least 1998. Given that losses of >50% are possible, sulfoxaflor's ability to protect cotton from Lygus-related yield loss is saving our growers millions of dollars (Ellsworth 2013; Ellsworth & Fournier 2022; Fournier et al. 2022, Figure 5).
- As one of only two active ingredients that is both effective against Lygus and selective for cotton arthropods, sulfoxaflor plays a key role in resistance management by relieving selection pressure from exclusive use of flonicamid (Carbine) for Lygus control (Ellsworth & Peterson 2017).
- Conservation of natural enemies (beneficial arthropods) is a central aspect to the ongoing cotton IPM program. 95% and 94% of all sprays made for whiteflies and Lygus, respectively, are fully selective and safe to the beneficials in the system (Ellsworth & Fournier 2022; Fournier et al. 2022, Figure 1). Our research shows that Transform use in cotton is not significantly different from unsprayed controls when it comes to impact on non-target organisms, including beneficial predators relied on in this system for

conservation biological control. Transform use in cotton reduces target pests, conserves non-target arthropods including key predators, supports improved predator to prey ratios and therefore successfully integrates chemical with biological controls (Ellsworth 2013; Ellsworth & Peterson 2017; Bordini et al. 2021).

- A detailed summary of non-target effects of sulfoxaflor, conservation of natural enemies, and its role in the Arizona Cotton IPM program are provided in our September 2022 comments in response to EPA's Draft Biological Evaluation for Sulfoxaflor (Fournier et al. 2022).
- After 9 years of commercial use on hundreds of thousands of acres in Arizona where there is a significant honeybee industry and crops requiring pollination services, there have been no reported bee incidents associated with that use (Ellsworth & Peterson 2017).
- Once the cotton canopy closes, most acreages are inaccessible by ground. Aerial application is required in our system (Ellsworth & Fournier 2022).
- Based on pesticide use reporting, 42.7 ± 5.6% of acre-sprays made to cotton have been with sulfoxaflor with growers spraying 0.48 ± 0.6 times per year (average of 5 use years) (Fournier et al. 2017).

Vegetables and Melons

- Arizona growers are one of the leading producers of fresh-market vegetables in the U.S., producing vegetables and melons at an estimated total economic contribution of over $2.5 billion in 2015 (Kerna et al. 2016). This includes about 90% of all fresh lettuce consumed in the U.S. in the winter (Satran 2015). In 2022, the combined value of production for head lettuce, leaf lettuce and romaine exceeded $969 million, with production on 63,900 acres (USDA 2023a).
- Melon growers in the southwestern U.S. have become heavily dependent on the availability of effective insecticides such as sulfoxaflor for the control of adult sweet potato whiteflies, *Bemisia tabaci* (b-biotype) because of the establishment of a whitefly-vectored virus, Cucurbit Yellows Stunting Disorder Virus (CYSDV). Without effective management of the whitefly vector, CYSDV can cause yield losses in excess of 70% (Palumbo 2016).
- In vegetables and melons, effective control of most aphid species can be achieved at low use rates of sulfoxaflor, while comparable control of *Bemisia* whiteflies often requires considerably higher use rates. Maintaining a flexible rate structure for sulfoxaflor products will be critical if we expect to replace older, "less IPM friendly" products with newer, reduced risk active ingredients like sulfoxaflor (Palumbo 2013).
- Fruiting Vegetables (Chiles). Arizona has small but significant production of chile peppers, including both organic and conventional production. Chile peppers typically rank among the top three crops in New Mexico (USDA 2023b), with 8,400 acres in production in 2022. Transform is used in conventional peppers to control aphids and plant bugs. Aphids are known to spread Potyvirus mosaic diseases in peppers, which can cause stunting, leaf curling, and fruit distortion along with the mosaic pattern on leaves (Koike et al 2009). Sulfoxaflor provides effective, selective control of aphids in peppers and can be critical to disease management.

Other Crops

- **Citrus.** in 2021, nearly 2,400 acres of lemons were treated with sulfoxaflor, according to the Arizona Pest Management Center Pesticide Use Database (Fournier et al. 2017). Sulfoxaflor is used for control of Asian citrus psyllid in lemons and other citrus. The Asian citrus psyllid vectors the bacterium that causes citrus greening. Citrus greening, also known as HLB, is the most destructive disease of citrus. This disease can destroy all types of citrus trees, including orange, grapefruit, lemon, lime, kumquat, tangerine, and relatives like orange jasmine (TCPDMC 2022).
- **Nuts (Pecans & Pistachios).** In 2021, Arizona produced 22,000 acres of pecans valued at $93 million (USDA 2022). Pecans are also a major crop for neighboring New Mexico, with 47,000 acres harvested in 2022 valued at $132.7 million (USDA 2023b). In pecans and pistachios, sulfoxaflor is effective against aphids that cause damage to young tree nuts, leading to reduced yields and potential crop destruction.
- **Dry Beans.** Although not frequently reported to be used in dry beans, according to licensed Pest Control Advisors (PCAs) familiar with the crop, use of Transform at the maximum rate is critical for Lygus control and suppression of stink bugs in dry beans. Both types of insects are seed feeders and can cause substantial yield losses for growers when outbreaks occur.

Our Data and Expert Information

The Arizona Pest Management Center (APMC) 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 Integrated Pest Management (IPM) programs that protect economic, environmental and human health interests of stakeholders and the society at large.

Through cooperative agreements with Arizona Department of Agriculture (ADA), the APMC obtains use of, improves upon, and conducts studies with ADA's Form1080 pesticide use 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) agricultural pesticides used in the state of Arizona, including all aerial applications. Grower self-applied pesticide applications may be under-represented in these data. 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, Utah and the southeast desert regions of California.

Through the Crop Pest Losses and Impact Assessment program, a Signature Program of the Western IPM Center, the Arizona Pest Management Center conducts annual surveys with state-licensed pest control advisors (PCAs), who are the primary pest management decision makers, in consultation with growers. The surveys, conducted at face-to-face and virtual meetings, provide detailed information on crop yield losses to specific insect pests, weeds and diseases, control costs, and pesticide use for the key crops, cotton and lettuce. Cotton data have been collected since 1991 and lettuce data since 2005. Data are collected for all of Arizona and neighboring production regions of southern California, with typical responses representing up to 65% of acres planted in Arizona. These data provide detailed information on shifting pest trends, chemical

uses and costs, and often compliment and augment pesticide use information from the APMC Pesticide Use Database, particularly for pesticide uses for which the state does not mandate reporting.

In addition, we actively solicit input from stakeholders in Arizona and adjacent production regions of southeastern California, including those in the regulated user community, to better understand use patterns, use benefits, and availability and efficacy of alternatives. These comments are based on the extensive information from the Arizona Pest Management Center Pesticide Use Database, Cotton and Lettuce Pest Losses Surveys, input from end-users, and the expertise of Arizona Pest Management Center faculty.

In conclusion, we strong supports EPA's 2019 Decision Memorandum for sulfoxaflor, and ask that these comments based on scientific data and real-life experiences of sulfoxaflor use over several years and hundreds of thousands of acres of diverse crops in the Desert Southwest be considered in EPA's decision process.

Thank you for the opportunity to comment. Please feel free to contact us with any questions.

Dr. Alfred Fournier, Associate Director,
Arizona Pest Management Center
Maricopa Agricultural Center
University of Arizona
37865 Smith-Enke Rd., Maricopa, AZ 85138
520-705-9903
fournier@cals.arizona.edu

Dr. Peter C. Ellsworth, Director,
Arizona Pest Management Center
Maricopa Agricultural Center
University of Arizona
37865 Smith-Enke Rd., Maricopa, AZ 85138
480-363-7185
peterell@cals.arizona.edu

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