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Response to EPA Proposed Interim Decision for Chlorpyrifos

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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.

At this time, we wish to respond to the Agency's Proposed Interim Decision for the insecticide chlorpyrifos, Docket number EPA–HQ–OPP–2008–0850, on behalf of agricultural stakeholders. Our comments combine stakeholder input received from University of Arizona Extension Specialists, licensed pest management professionals, and reported pesticide use data from the Arizona Pest Management Center Pesticide Use Database.

Incorporation of Previous Comments

We wish to incorporate into our current response the following comments, previously submitted to EPA in the "Chlorpyrifos Tolerance Rulemaking" Docket, EPA-HQ-OPP-2015-0653, on the topic of chlorpyrifos use in Arizona crops:

Ellsworth P.C., A.J. Fournier, W.A. Dixon II, C.M. Rock. 2016. Chlorpyrifos Use in Arizona. University of Arizona, Arizona Pest Management Center. Document ID: EPA-HQ-OPP-2015-0653-0380. https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0380

Palumbo, J.C. 2016. RE: Document ID: EPA-HQ-OPP-2015-0653. Docket ID: EPA-HQ-OPP-2015-0653-0260.
https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0260

Fournier A.J., A.M. Mostafa, J. Sherman, W.A. Dixon II, P.C. Ellsworth. 2017. Chlorpyrifos Use in Arizona and New Mexico. University of Arizona, Arizona Pest Management Center.

Document ID: EPA-HQ-OPP-2015-0653-0654. https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0654

Palumbo, J.C. 2017. RE: Document ID: EPA-HQ-OPP-2015-0653-0402. Docket ID: EPA-HQ-OPP-2015-0653-0631.
https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0631

Brief Summary from Previous APMC Comments

In 2015, the EPA proposed a revocation of all tolerances for chlorpyrifos, based on human health concerns. The Arizona Pest Management Center (APMC) submitted a total of four comments in 2016 and 2017, in response to EPA's proposed action, including two comments by University of Arizona Extension Entomologist, Dr. John Palumbo.

Our comments noted a steady decline in chlorpyrifos use in Arizona crops, in favor of newer and often more selective chemistries, but also highlighted some specific situations where chlorpyrifos use remains an important and valuable tool for growers. This includes its use for control multiple pests in alfalfa, including Egytian alfalfa weevil and lepidopteran pests; for bagrada bug and lepidopteran pests in cole crops; sugarcane aphid in sorghum; and for lepidopteran control in corn. We also reported that chlorpyrifos was the most effective material for control of the damaging black pea aphid in pecans in Arizona and New Mexico. Chlorpyrifos was one of very few effective controls for pink bollworm in cotton, prior to the eradication of this yield-limiting pest in the Desert Southwest. Should pink bollworm ever become re-established, continued access to chlorpyrifos could make big economic differences for our cotton growers.

Comments by Ellsworth et al. (2016) pointed out concerns with EPA's modeling of risk not accounting for many of the realities of Arizona agriculture, and cited data from the Arizona Department of Environmental Quality that show a lack of detections of chlorpyrifos residues in local water supplies during peak years of chlorpyrifos use.

Based on EPA's risk assessments, we understand the importance of mitigating potential human health risks from chlorpyrifos to the greatest extent possible. Our growers and professional pest control advisors have greatly reduced the use of this chemistry and gradually replaced it with reduced-risk materials as they have become available to effectively manage pests. In crops where we still see some usage, chlorpyrifos is generally an option of last resort. There are properties of this insecticide that make it uniquely useful for certain pests during outbreak years, particularly some that can be difficult to control with other materials. In this document, we seek to clarify some of these niche uses of chlorpyrifos and provide specific details on rates, formulation and application methods to help inform and further refine EPA risk assessments. We are proud of the level of environmental stewardship and innovation shown by our growers across a broad range of crops in Arizona, and also appreciate EPA's role in helping to protect human health and the environment.

Arizona Use Patterns for Chlorpyrifos
Since the submission of these prior comments in 2016 and 2017, chlorpyrifos use has continued to decline even further across most of these crops. The most significant remaining use pattern in Arizona in terms of treated acres is for alfalfa (Fig 1).

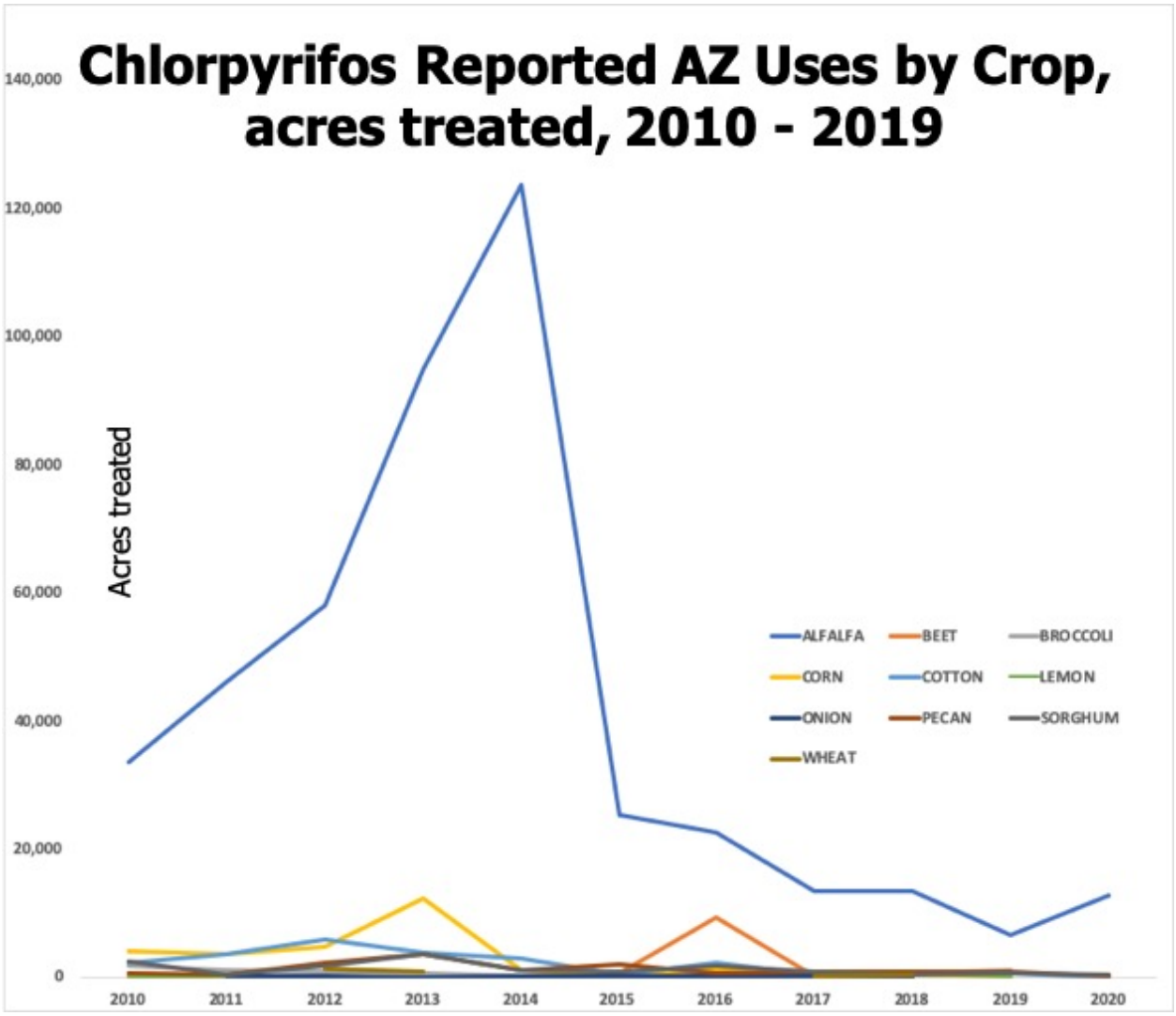

Figure 1: Reported use of chlorpyrifos use in Arizona crops between 2010 and 2019 (reported acres treated). 2020 data are incomplete in this figure, but are included to show that even with partial data, an increase in acres treated for alfalfa since 2019 is apparent. Use patterns can fluctuate based on populations of Egyptian alfalfa weevil and other pests. Source: *The Arizona Pest Management Center Pesticide Use Database, unpubl.*

Chlorpyrifos Crop by Crop:
Use Patterns and Response to Proposed Interim Decision

<u>Alfalfa</u>
In 2019, alfalfa was the second most valuable crop in Arizona (behind lettuce), with 280,000 production acres valued at over $476mil. (USDA-NASS 2020).

Although annual use of chlorpyrifos on alfalfa in Arizona has continued to decline, it remains the most prominent use pattern in terms of acres treated in the state. While only a portion of statewide acres are treated in a given year—often a very small portion—chlorpyrifos remains a valuable tool for control of troublesome pests, particularly in outbreak situations. It is used primarily to control Egyptian alfalfa weevil, a challenging, yield-limiting insect, and also provides control of aphids and lepidopteran pests. Chlorpyrifos offers fast-acting control with longer residual than many alternatives, and can be important to resistance management. While alternatives, including pyrethroids, are available and are used to control the weevil, during bad outbreak years when populations are difficult to control, use of chlorpyrifos, with or without a tank-mixed pyrethroid, remains the most effective and economical option for our growers.

Based on information from licensed pest control advisors (PCAs), chlorpyrifos is uniquely effective in situations where Egyptian alfalfa weevil is present at the same time as other pests, particularly aphids or lepidopteran pests, due to its broad spectrum of activity. Chlorpyrifos is highly effective, with a longer residual than alternatives, and is considerably less expensive. The lower price can make a big economic difference for growers, who may need to treat thousands of acres of alfalfa. Multiple applications of a mixture of chlorpyrifos / lambda-cyhalothrin may be used in years when weevil populations are difficult to control. Applications are made by ground or air, depending on the situation and location. Some estimate about a 50 / 50 split between ground and aerial application methods. The Lorsban 4E formulation is used. Rates vary depending on when the chemical is applied relative to the cutting schedule. Growers use 8 fl.oz./ac to 32 fl.oz./ac., depending on days to harvest, according to the label. When it is feasible, based on timing of the pest, alfalfa is cut to avoid making a chlorpyrifos spray. Some PCAs indicate they only use chlorpyrifos late in the season if needed against multiple pests. This approach helps to preserve natural enemies and biological control in the field over a longer period of time, reducing the need for sprays.

Use of chlorpyrifos is most important in years when weevil populations are particularly tough to control. PCAs indicated they do not use it every year, only in difficult situations. One PCA who does not use chlorpyrifos every year indicated that nearly 100% of alfalfa acres he scouted in Southeastern Arizona received one chlorpyrifos spray in 2020. 90% of these sprays were applied by air. In most parts of the state, in most years, only a portion of acres are treated with chlorpyrifos.

We are pleased that Arizona is listed among the states expected to retain labelled uses of chlorpyrifos in alfalfa, but also note that potential restrictions on aerial applications and a requirement for closed systems for mixing and loading appear to be problematic for our growers. These concerns are addressed in more detail in comments submitted by the Arizona Farm Bureau Federation, which the Arizona Pest Management Center supports and to which we contributed.

Corn

Arizona produces field corn for grain and silage. In 2019, Arizona produced 37,000 acres of grain corn valued at $45.3mil., and 50,000 acres of silage corn, value undisclosed (USDA-NASS 2020). Over the past five years, according to the Arizona Pesticide Use Database, about 1,100

acres of corn were reportedly treated with chlorpyrifos, and treatments were not reported every year (Fournier et al. 2017a).

Most pest control advisors consulted indicate that there is little to no use of chlorpyrifos in corn in recent years. Widespread adoption of Bt corns is one reason cited. However, should Bt resistance occur, it is important to note that chlorpyrifos is the only efficacious material available to treat Southwest cornstalk borer, a lepidopteran pest of corn. The worm feeds on foliage in the whorl of the corn, deep in the stalk, and is difficult to control. Besides this particular pest, PCAs note that there are other effective materials available for insect control in corn.

Cotton

In 2019, cotton was the third most valuable crop in Arizona, with over 158,000 harvested acres of upland cotton valued over $190mil., including cotton seed production (USDA-NASS 2020). Use of chlorpyrifos in Arizona cotton has continued to decline, with an average of 569 acres reportedly treated annually between 2017 and 2019. It is particularly effective for control of Armyworm. However, PCAs confirm declines in its use, sometimes attributing it to the success of Bt cotton for managing key lepidopteran pest like armyworm. It remains a useful tool in non-Bt upland cotton and Pima cotton, which in 2020, represented about 6% of cotton acres statewide (based on Cotton Pest Losses survey data). However, according to Dr. Peter Ellsworth, University of Arizona Extension Specialist, there are several other viable options for lepidopteran control, such as Prevathon (chlorantraniliprole), Exirel (cyantraniliprole) and Intrepid (methoxyfenozide), though some of these options are more expensive for growers.

When chlorpyrifos is used in cotton, the 4E formulation of Lorsban is applied, typically by air, at the 1 to 2 pt./ac. (0.50 to 1.0 lbs. a.i./ac., 0.70 a.i./ac. median rate). Only a portion of acres are treated, based on pest levels and distributions, often a small percentage of acres. 69% of reported chlorpyrifos applications from 2010 through 2019 were made by air (Fournier et al. 2017a).

As noted in our prior comments, chlorpyrifos was uniquely effective for the control of pink bollworm, a major economic pest of cotton which has been eradicated in Arizona and surrounding regions (Tabashnik et al. 2021). Investment in Bt cotton technology and a regional eradication program representing a combined investment of over $130million could be at risk if this pest were to return and we did not have in place the most effective tool for its control: chlorpyrifos (Ellsworth et al. 2016). We suggest, that the agency retain federal tolerances on cotton so that, should pink bollworm populations return to Arizona, we would have the option to secure an emergency exemption for use of chlorpyrifos.

Pecans

In 2018, Arizona ranked 4th in national pecan production, harvesting nearly 28mil. pounds of pecans, 11.5% of national production, valued at over $52mil (USDA- NASS 2019).

While chlorpyrifos use has declined, it continues to be an important product, effective against many pecan pests in Arizona and New Mexico, including aphids, pecan nut casebearer, and pecan weevil. Use of reduced-risk alternatives have replaced many chlorpyrifos sprays in pecans,

which have declined but stabilized at just under 1,000 ac./yr. the past few years (Fournier et al. 2017a). Alternatives include Movento (spirotetramat), Silvanto (Flupyradifurone), PQZ (Pyrifluquinazon), Transform and Closer (sulfoxaflor). Chlorpyrifos is highly effective against the black pecan aphid when populations levels are high, such as for late season control in a rainy season or following severe weather events. Late season applications help preserve beneficial arthropods (predators) earlier in the season. In New Mexico, skip-row treatments which use half the amount of chemical are highly effective (see prior comments, Fournier et al. 2017b). Chlorpyrifos remains an option of last resort, but an important one in some situations. As one PCA said, "If we are using it, the house is on fire." PCAs estimate 10% to 20% of Arizona acres are treated in problematic years. 93% of reported chlorpyrifos sprays in pecans over the past decade were made by air. However, airblast applications and closed-cab ground applications are also used by grower some growers. Rates vary from 1.0 to 2.0 lbs. a.i./ac., with a median rate of 1.52 a.i./ac. (Fournier et al. 2017b).

We are greatly concerned that Arizona is not listed among the states in Table 11 for retention of a label based on the 1X safety factor analysis. We note that our geographic neighbor, New Mexico, is listed for retention. The two states share similar conditions with respect to pecan acres, common pests and growing conditions. I hope our comments demonstrate the professionalism and stewardship of pest control advisors in Arizona, reserving uses of chlorpyrifos only for critical pest situations. Furthermore, our previous comments demonstrated a lack of chlorpyrifos detections in Arizona ground water (Ellsworth et al. 2016).

Regarding EPA's consideration of a requirement for closed-cab airblast sprayers, this would not pose a problem for the Arizona pecan industry, as our growers already use this equipment.

Citrus

The Arizona Pest Management Center supports and contributed to comments on citrus uses of chlorpyrifos submitted by the Arizona Farm Bureau Federation.

Who We Are

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. 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. 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.

Through the Crop Pest Losses and Impact Assessment program (WIPMC 2018), partially funded through 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 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 California, with typical responses representing up to 65% of acres planted in Arizona. These data provide detailed information on shifting pest trends, chemical use and costs, and often compliment and augment information from the APMC Pesticide Use Database, particularly for pesticide uses for which the state does not mandate reporting.

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