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Response to Proposed Interim Decision for Chlorothalonil Use in Arizona and Southeastern California
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Comments submitted by the Arizona Pest Management Center, University of Arizona

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The EPA is seeking public comments in response to its Proposed Interim Decision for the fungicide chlorothalonil. We respond on behalf of agricultural stakeholders and the golf course industry in Arizona and Southeastern California. Our comments combine stakeholder input received from university Extension Specialists, licensed pest control advisors, golf course industry professionals, and reported pesticide use data from the Arizona Pest Management Center Pesticide Use Database.

These comments are a follow up to comments we submitted in response to draft risk assessments for chlorothalonil in July 2021. We wish to integrate these previous comments by reference into this communication:

Fournier, A.J., W.A. Dixon II. 2021. Chlorothalonil Use and Benefits in Arizona and Southeastern California. 7/16/21. **Document ID: EPA-HQ-OPP-2011-0840-0095**

Agricultural Use & Response to Proposed Mitigations
Chlorothalonil is used to control downy mildew on onions and vegetable crops, as well as purple blotch in onions, powdery mildew on celery, early blight and late blight in potatoes, and Alternaria in cole crops grown for seed. Our previous comments (Fournier and Dixon 2021) provided information on disease damage as well as detailed agricultural use information.

According to pesticide use data submitted by growers to the Arizona Department of Agriculture and maintained in the Arizona Pest Management Center database (Fournier et al. 2017), chlorothalonil has significant regular uses in onions, including onions grown for seed that support national production. While occasional uses are reported in a few other crops, including cabbage, broccoli and cauliflower (some grown for seed), celery and potato—apart from onions, use appears to be limited in most cases to a single application per growing season, based on pesticide use data. We provided typical use rates for all these crops, except for potato, in our

previous comments. In potato, single use rates range from 0.6 lbs ai/A to 1.12 lbs ai/A, with a median of 1.02 lbs. The 1.12 lb. use rate is very common. In most cases, use reports indicate probably one seasonal use of chlorothalonil, so this is well below the proposed annual use rate. The same is true for all other "occasional use" crops. We address onions in more detail below because of the importance of chlorothalonil in their production.

Chlorothalonil is an important component of disease control programs in onion production in the Yuma, Arizona region (including adjacent Bard, in Imperial County of California) and in La Paz County Arizona and adjacent Riverside County California, encompassing production between Parker, AZ in the north and Palo Verde, CA in the south, on both sides of the Colorado River. Examination of pesticide use reporting data in Arizona and California and interviews with licensed Pest Control Advisors in 2021 revealed similar use patterns across both regions, where Ridomil Gold Bravo is used to control downy mildew and other diseases which can be devastating to yield and quality of dry bulb onions produced for consumption and for seed.

Ridomil Gold Bravo is a pre-mix product containing 3.34 lbs of chlorothalonil per gallon. Typical single use rates in both regions top out at 2.5 pts./A, or 1.04375 lbs ai/A. One to three applications are used per season in the Yuma area, and typically only one application in the La Paz County / Blythe region. This represents a maximum annual use rate (in Yuma) of 3.13125 lbs ai/A chlorothalonil, well within EPA's proposed maximum annual use rates for both vulnerable and non-vulnerable soils.

To the best of our knowledge across all known crop uses in Arizona and adjacent regions of Southeastern California, use patterns for chlorothalonil are well within EPA's proposed annual use rates as outlined in the Proposed Interim Decision.

EPA's proposed buffer zones for adjacent waterways were not a concern for pest control advisors we spoke to, as most production areas for onions would not be that close to aquatic areas.

Golf Course Use & Response to Proposed Mitigations

Our previous comments in response to draft risk assessments did not address chlorothalonil uses on golf course turf. This was an oversight, as chlorothalonil is a critical component of turf disease management on golf courses in the desert southwest.

The Arizona golf industry is a strong contributor to the state economy with a total economic contribution of $3.9 billion in sales in 2014, including golf facility operations, golf tourism, and golf-related businesses (Duval et al. 2016). California golf courses often host charitable tournaments of the Professional Golfers Association of America (PGA), which have raised over $120 million for charity in Northern California since 1937, including $10 million in 2017 alone. One reason that the golf industry thrives in Arizona and California is our warmer winter climates, which result in a large winter tourism industry keeps courses in active play year-round. This necessitates year-round management of diseases to maintain playability of turf and puts additional pressure on the need for effective resistance management to maintain efficacy of available modes of action.

Response to proposed mitigations for Golf Courses

Our comments in this section incorporate feedback from local members of the golf course industry, as well as elements identified in comments independently submitted by Dr. Paul Koch et al., a group of several turfgrass pathologists and extension specialists from land-grant universities around the U.S. We had the opportunity to review a draft version of these comments and agree with many point the authors have raised.

Members of the golf course industry in the desert southwest region and turfgrass pathologists and extension specialists nationwide have expressed concerns with EPA's proposed mitigations in three main areas:

1. Proposed maximum annual use rates, particularly for applications on vulnerable soils for golf course greens.
2. Proposed 25ft buffer zones around waterways.
3. The need for an improved explanation of the definition of vulnerable soils, in particular as it should apply to golf course greens (as opposed to agricultural fields).

Proposed Maximum Annual Use Rates & Buffer Zones for Waterways

As currently described, these proposed mitigations would render chlorothalonil potentially unusable on golf course greens. First, because the proposed maximum annual use rate for chlorothalonil on vulnerable soils of 6.2 lbs of AI per acre is below the lowest recommended rate for a single application on some current labels, or in other cases may allow for on a single year-round application of chlorothalonil.

Secondly, water features are often a major design element of golf courses, and in some cases are found within 25ft of greens. Where this occurs, it would limit the ability of superintendents to manage diseases on those greens, resulting in uneven play and economic losses. We agree with Koch et al. that EPA should consider developing a golf-course specific, research-based runoff prevention strategies that account for the unique aspects of golf course turf, and in particular, greens. Golf course greens are unlike agricultural fields in many ways. Compared to conventional till agriculture, golf course greens are often rich in organic matter which has binding properties and is scientifically demonstrated to reduce pesticide runoff. Koch et al. raise several good points, including citation of scientific literature that supports the above statement. In addition, they point out:

> "[EPA's] acute and chronic dietary [risk] assessments assumed estimated drinking water concentration derived from the Wisconsin central sands scenario. While this was used as an upper bound estimate, this may not be representative of chlorothalonil environmental fate in other noncropland systems, including turfgrass systems. Further, the assessment was based on 100% crop treated for all commodities, which likely over-estimated impact(s)."

We would further point out that golf course greens are often spot-treated for diseases.

Definition of Vulnerable Soils

In its Proposed Interim Decision, EPA defines vulnerable soils as "sandy or coarse-textured soils with less than 2% organic matter content and occur where the water table is 30 feet or less from the surface."

We have the following questions:

1. Do all 3 factors have to be present for a soil to be considered vulnerable? Sandy soils + less than 2% organic matter + water table 30ft or less from soil surface = vulnerable soil.
2. How deep does the 'soil' go? While many golf course greens are artificially engineered with a layer of sandy soil low in organic material, thus potentially qualifying as 'vulnerable,' the sand is typically limited to the top 18-24" of soil. Below that sits the native soil, which perhaps should be assessed separately.

Because of the differences between agricultural fields and golf course greens described above, we agree with Koch et al. that either engineered rootzones found on golf course putting greens be exempt from the definition for vulnerable soils or that EPA should provide clearer instructions on how vulnerable soils should be defined for golf course environments. Part of this might be a consideration of the thatch/mat component of golf turf and its impact on leaching and runoff.

Conclusion for Golf Turf Section

We cannot overstress the importance of chlorothalonil as an effective control for several diseases on golf course turf, including fusarium, anthracnose, pink snow mold. Furthermore, the multisite activity of chlorothalonil makes it an important and effective rotational partner to support effective fungicide resistance management. This is particularly important in the desert southwest, where golf courses receive year-round play. We hope EPA can provide careful consideration of the appropriate fit of its agricultural models for expected leaching / runoff of chlorothalonil, as applied in the golf course environment, and how this might impact the need for and extent of mitigations.

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. 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

Duval, D., A. Kerna, G. Frisvold, K. Umeda and R. Li. 2016. Contribution of the Golf Industry to the Arizona Economy in 2014. University of Arizona Cooperative Extension. https://economics.arizona.edu/contribution-golf-industry-arizona-economy-2014

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