



**Fludioxonil Use in Arizona Crops**  
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**Comments submitted by the Arizona Pest Management Center**  
**University of Arizona**

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**Summary**

- EPA is seeking public comments in response to draft human health and ecological risk assessments for fludioxonil, a systemic fungicide used to control powdery mildew. It is registered for use on several crops in the desert southwest.
- Draft environmental risk assessments for fludioxonil indicate potential concerns for aquatic organisms and fish in freshwater and marine environments. Acute risks for birds and acute and chronic risks for mammals were also indicated. The draft human health risk assessment indicated liver and kidney toxicity in tested species.
- At this time, our goal is to inform EPA of uses of fludioxonil in selected desert southwest cropping systems.
- Fludioxonil is a standard treatment for potato seed pieces and is applied one or two days before planting. Treated seed pieces are planted 8 to 10 inches deep and immediately covered over. Fludioxonil is only used as a seed treatment at planting and at no other time during the season.
- Fludioxonil is one of the few compounds that will suppress the melon fungus, *Monosporascus cannonballus*. This soil-borne pathogen is adapted to hot and dry environments, and causes root rot and vine decline in cantaloupes and watermelons, which can lead to significant yield losses.
- Fludioxonil is also used to control sclerotinia in melons and lettuce. However, use levels of this compound are low compared to other fungicides in both crops.

**Fludioxonil use in Arizona**

Based on data from the Arizona Pest Management Center (APMC) Pesticide Use Database (Fournier et al. 2017), fludioxonil is reportedly used on a small percentage of acres in lettuce and melons. Use levels are low, compared with other fungicides in these crops. Fludioxonil is also used as a seed treatment in potatoes.

### Potatoes

While not a large producer of potatoes, Arizona grows several varieties for a number of different markets, including small, red, and big gold potatoes. We spoke with two Pest Control Advisors (PCAs) who work with the growers in central Arizona, representing a large percentage of our potato acres statewide. They both indicated that fludioxonil is their standard seed treatment for potatoes. The practice is to apply either dust or liquid formulations of fludioxonil to potato seed pieces, which are then allowed to dry for one or two days before planting. The drying process is important, as it reduces the risk of other types of fungal development. The pieces are then planted mechanically 8 to 10 inches in the ground and immediately covered over with soil as the planter passes. This practice should minimize potential exposure of birds to the chemical. A relatively light irrigation is applied after planting, and there would be no expectation of runoff. Fludioxonil is only used as a seed treatment at planting and at no other time during the season.

### Melons

Arizona produces fresh market cantaloupes and watermelons. In 2016, over 20,000 combined acres harvested were valued at over \$98 million (USDA-NASS 2017). According to Dr. Michael Matheron, Extension Plant Pathologist with University of Arizona, fludioxonil is one of the few compounds that will suppress the melon fungus, *Monosporascus cannonballus*. This soil-borne pathogen is adapted to hot and dry environments, and causes root rot and vine decline in cantaloupes and watermelons, which can lead to significant yield losses (Colucci, S.J. 2007). One PCA working in melons indicated that their program for managing cannonballus was effective without the use of fludioxonil. One strategy they use is to kill off the melon plants soon after harvest with metam sodium, a practice that helps prevent build up of the pathogen in the soil. In Arizona, fludioxonil is also used to prevent or treat sclerotinia. One pest control advisor we spoke to said he had used it in melons, but he felt there are better options for sclerotinia.

### Lettuce

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 over 90% of all fresh lettuce consumed in the U.S. in the winter, valued at over \$920 million in the 2015–2016 season (USDA-NASS 2017). One Arizona PCA we spoke with used fludioxonil on leaf lettuce and head lettuce for sclerotinia control and said it was effective. “When the pathogen gets airborne, it gets on the leaves and takes the whole plant down. We apply fludioxonil with a ground rig.” Based on this application technique, he said there was very little chance of product getting into irrigation canals. He also said, “While there are more critical fungicides we rely on, this is one of the few options if a grower cannot apply by air.”

### 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. Mike Matheron is the University of Arizona Extension Plant Pathologist with many years of experience working on disease management for vegetable crops in the Yuma County production region of Arizona, particularly for leafy greens and melons. 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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