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Metam Sodium Use and Importance in Arizona Melon Production
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Summary

- EPA is seeking public comments in response to new draft human health risk assessments for conventional uses of metam sodium and metam potassium.
- At this time, our goal is to inform EPA about important benefits of the use of metam sodium to manage a devastating fungal disease, Monosporascus vine decline, in desert melon cropping systems in Arizona.
- A single, low-rate application of metam sodium via sub-surface drip irrigation is highly effective for quickly destroying the melon crop after harvest to prevent development of *Monosporascus cannonballus* spores, reducing soil inoculum and limiting greatly infection of the melon crop that follows.
- There are currently no viable chemical alternatives to this treatment.
- Loss of metam sodium registrations on melons, should it happen, would have serious economic impacts on our growers, due to a high potential for stand loss if the cannonballus pathogen is not effectively controlled.

Metam Sodium use in Arizona

Based on data from the Arizona Pest Management Center (APMC) Pesticide Use Database (Fournier et al. 2017), from 2010 through 2018, metam sodium has been used primarily in melons (cantaloupe, watermelon, honeydew), and to an extremely limited extent, on head and leaf lettuces. Because metam sodium is a Restricted Use Pesticide (RUP), state statutes require reporting of all applications made in Arizona, so we have high confidence in these data. Records show consistent applications in melon crops each year, with 682 applications reported between 2010 and 2018. About 2,500 acres of melons were treated in 2017, which is at the high end of annual use. In lettuce, metam sodium has been used to control fusarim blight, however, no applications have been reported since 2014. When used in lettuces, applications have been restricted to a few hundred acres (or less) each year. Other crops with a few or singular small-acre applications include carrots, cauliflower, cotton, rose and spinach. In the same time span, growers reported 53 fallow land applications over 1,710 acres.

Metam Sodium Use in Arizona Melons

Arizona produces fresh market cantaloupe, watermelons and honeydew. In 2017, 19,400 combined harvested acres produced fruit valued at nearly $128 million (USDA-NASS 2018). With limited agricultural land available in Arizona, and limited water, large melon growers rely on subsurface drip irrigation systems and re-plant melons in the same fields, often double-cropping.

The use of metam sodium (Vapam HL) is critically important to melon production in central and southwestern Arizona. Vapam HL is currently the only effective and economically viable treatment for Monosporascus vine decline, which can be devastating in melons. The disease is initiated when the soil borne fungal pathogen, *Monosporascus cannonballus,* infects the roots of the plants. The disease is characterized by a sudden and often uniform collapse of fields one to two weeks prior to harvest. The disease is especially severe in arid regions, and both cantaloupes and watermelons are susceptible (Davis et al. 2019). According to a professional pest control advisor who works in Arizona melons, the consequences of not initiating treatment is about a 50% chance of not being able to harvest the crop. Loss of this use of metam sodium would have serious economic impacts on the production of melons in Arizona (currently about 21,000 acres).

A single treatment of metam sodium (Vapam HL) is applied through sub-surface drip irrigation as a post-harvest (crop-destruct) soil fumigation treatment that quickly kills the remaining crop plants, prior to planting the next crop. This prevents development of *Monosporascus cannonballus* spores, reducing soil inoculum and limiting greatly infection of the crop that follows. This treatment is highly effective and very low cost. Typical use rates on Arizona melons are between 5 and 8 gallons of product per acre, or about 21 lbs. to 34 lbs. of active ingredient (a.i.) per acre, a fraction of the maximum use rate of 320 lbs. a.i. per acre.

Application via sub-surface drip irrigation minimizes any off-site movement of chemicals or drift concerns, as well as reducing the potential for applicator or by-stander exposure. All label requirements are followed, including completion of a fumigant management plan for every field and block of melons planted. The plan provides very specific information on buffer zones, re-entry, etc. Farm staff receive annual safety training in the application of fumigants from the supplier.

While there are alternative pesticides that will kill the melon plants, including glyphosate and paraquat dichloride, these are far less effective for controlling the disease. Glyphosate kills the plant too slowly, allowing time for the spores to develop and disperse. Paraquat dichloride does not kill the roots, where the pathogen mainly reproduces. The metam sodium treatment kills the plants within an hour, including root tissues, before the pathogen can reproduce. According to production experts, there is no other choice for effective control of cannonballus in our production system.

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. 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 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 Cited

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