

6 July 2009

To: EPA

Re: Comment on EPA-HQ-OPP-2002-0262

Dear EPA,

Arizona and specifically Arizona cotton growers have been a consistent user of endosulfan for over 50 years. Our unique environment, long growing season, and extensive heat contribute to insect pest problems that require many chemical and non-chemical tools for their management. As an IPM Specialist, State IPM Coordinator, and State Pesticide Coordinator, I work with growers and professional pest managers to insure that science-based IPM programs are deployed whenever possible. These IPM programs represent standards in reducing risks to human health, the environment, and the economic competitiveness of our growers.

We have commented on Arizona's endosulfan use patterns in the past. I wish to update our use patterns given some significant changes in the marketplace and our ever changing economic and pest conditions. Also, by way of this report, I hereby respectfully request that our previous comments on endosulfan be incorporated into the current public comment docket. For your convenience, this information is also housed at the Arid Southwest IPM Network website, [http://ag.arizona.edu/apmc/Arid\\_SW\\_IPM.html](http://ag.arizona.edu/apmc/Arid_SW_IPM.html), a site dedicated to responding to consumer, client, regional, and federal inquiries regarding pest management tactics. These reports may be viewed or downloaded from [http://ag.arizona.edu/apmc/Arid\\_SWPMC\\_Info\\_Requests.html](http://ag.arizona.edu/apmc/Arid_SWPMC_Info_Requests.html). Specifically, reports are located at:

**2002:** [http://ag.arizona.edu/apmc/docs/Endosulfan\\_Response\\_12-4-02.pdf](http://ag.arizona.edu/apmc/docs/Endosulfan_Response_12-4-02.pdf) in response to EPA-HQ-OPP-OPP-2002-0262

**2006:** [http://ag.arizona.edu/apmc/docs/Endosulfan\\_Response\\_9-29-06.pdf](http://ag.arizona.edu/apmc/docs/Endosulfan_Response_9-29-06.pdf) in follow-up response to EPA-HQ-OPP-2002-0262

**2008:** <http://ag.arizona.edu/apmc/docs/08endoCommentToEPA2.pdf> in response to EPA-HQ-OPP-2008-0615-0001

The 2002 comment covers use years, 1999-2001, while the 2006 report covers use years, 2001-2005. The 2008 comment updated EPA about progress made in insect pest management in Arizona cotton especially as this relates to endosulfan. We do not have updated full use statistics for 2006-2008; however, by way of this comment I wish to provide detailed information on the use of endosulfan from extensive random surveys of grower records as well as update EPA on the changes in the Arizona cotton pest management system.

In 2006, Arizona cotton growers through their Arizona Cotton Research & Protection Council initiated an ambitious pink bollworm (PBW) eradication program. The goal is to functionally eliminate this pest of southwestern U.S. and Northern Mexican cotton. This pest has required continuous grower insecticide inputs and caused continuous losses in yield and quality since 1965. In 2008, because of the coordinated use of Bt cotton and the activities of the PBW eradication program, growers, for the first time since 1965, reported zero (0) sprays against PBW in Arizona cotton. The elimination of this pest as a threat to Arizona cotton production is a major achievement, and one that will contribute to our overall lowering of insecticide use in Arizona. While many new insecticides are effective against Lepidoptera, none controls PBW. Principal products used in the past to control PBW include chlorpyrifos, methyl parathion, and pyrethroids.

The impacts of removing the need to spray PBW are many. One is the reduced need to spray. This means fewer passes over a field with a plane or tractor mounted sprayer. This, however, also means that pest managers are pressured to accomplish more remedial inputs with fewer anticipated trips across the field. This is to increase efficiency and reduce application costs. Another effect is the potential for a reduced grower investment in Bt cottons, because PBW was the principal target for this technology. This opens up our production to an array of occasional, yet potentially serious lepidopteran pests (e.g., cotton leafperforator, salt-marsh caterpillar, cabbage looper, *Spodoptera* spp.), some of which can be controlled with endosulfan.

Another major change has been the registration of flonicamid (Carbine<sup>®</sup> starting in late 2006) for Lygus bug (Hemiptera: Miridae) in cotton. This selective chemistry is exceptionally safe to beneficial arthropods in our system and is highly effective against aphids, cotton fleahoppers and Lygus bugs. EPA obviously views this as an important alternative to endosulfan for Lygus control, which it is. However, we are very concerned that overdependence on this key chemistry and sole selective tool for Lygus control in Arizona cotton could lead to serious complications caused by resistance. Adoption rates have been very high for this compound (see below); however, we still teach to growers the importance of rotating to alternative chemistries for Lygus control.

Adoption of flonicamid for Lygus control has gone from zero in 2006 to extraordinary levels in 2008, despite the relatively low insect pressure of the last 3 years. We conducted a random survey of 58 cotton fields in central Arizona during 2008, where we obtained the full set of pesticide use records including information on the intended target for each spray and each active ingredient. Central Arizona represents more than two thirds of all cotton production in Arizona. As already mentioned, 2008 was a relatively low to moderate insect year; Bt cotton adoption was maximal (98.3%); flonicamid adoption already very high; and very few sprays made for arthropod pests overall (statewide average less than 1.7 sprays). Under these conditions, one would conjecture that endosulfan use would be as low as economically feasible.

#### Insecticide Use Patterns from Random Survey of Cotton Fields in Arizona

21% of all fields received no insecticidal sprays

98% of treated fields were sprayed at least once for Lygus bugs (78% overall)

20% of all sprays were endosulfan

55% of these targeted whiteflies (*Bemisia tabaci*, biotype B) only

15% of these targeted Lygus only  
 30% of these targeted whiteflies and Lygus simultaneously  
 55% of all insecticide sprays made targeted Lygus bugs  
 65% of these were with flonicamid  
 19% of these were with acephate  
 16% of these were with endosulfan  
 0% of these were oxymyl  
 0-9 active ingredients per field were used  
 10 active ingredients used overall; endosulfan ranked 3<sup>rd</sup> among all a.i.'s

<b><u>Rank</u></b>	<b><u>Level</u></b>	<b><u>%</u></b>
1	Flonicamid	35.7
2	Acetamiprid	22.0
3	Endosulfan	19.6
4	Acephate	11.9
5	Chlorpyrifos	4.2
6	Spiromesifen	3.6
7	Pyriproxyfen	1.2
8	Buprofezin	0.6
9	Lambda-cyhalothrin	0.6
10	Thiamethoxam	0.6

As shown by these recent use patterns, endosulfan continues to be a very important compound for Arizona cotton producers. Its unique niche as a singular compound with a spectrum of control that includes whiteflies and Lygus is unmatched by any other active ingredient currently registered. Furthermore, because of our relatively low insecticide use intensity and relatively light pressure, endosulfan use will continue to be favored. Under these conditions, endosulfan provides the only economical treatment of two major target species simultaneously. In addition, with adoption rates for flonicamid over 65%, we have continued concerns that alternative chemistries be available for resistance management purposes. Our current guidelines only suggest the use of flonicamid, acephate, endosulfan, or oxamyl, the latter not showing up in our survey from last year. The other three represent 3 different classes of chemistry, a minimum with which to manage resistance in this key pest.

In summary, we believe the EPA has seriously undervalued the benefits of this compound and failed to calculate the risk of catastrophic loss of flonicamid because of resistance, as well as the potentially substantial return of non-Bt cotton to Arizona production and the broad-spectrum benefits (including Lepidopteran control) that endosulfan provides.

Respectfully,



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