

# **Pesticide Information Request Response**

## **Arid Southwest IPM Network**

### **Arizona Pest Management Center**

**July 6, 2009**

**Data Request:** Endosulfan

**Subject:** EPA is requesting comment on the Agency's endosulfan impact assessments for eight crops (potato, tomato, cotton, apple, cucumber, squash, pumpkin and melons) and additional information on the importance of endosulfan use in agriculture. EPA is also seeking benefits information/data for the following crops: Almond, Apricot, Blueberry, Broccoli, Brussels sprouts, Cabbage, Carrots, Cauliflower, Celery, Citrus (nonbearing trees and nursery stock), Collard greens, Crops grown for seed (alfalfa, cabbage, collard greens, cucumber, kale, kohlrabi, melons, pumpkin, radish, rutabaga, squash, turnip), Dry beans, Dry peas, Eggplant, Filbert, Kale, Lettuce, Mustard greens, Nectarine, Ornamental trees, Shrubs, and Woody plants, Plum and Prune, Sweet corn, Sweet potato, Strawberry, Tobacco, Turnip, and Walnut.

**Date of request:** May 21, 2009

**Comments Due:** July 6, 2009

**Process:** Al Fournier of the Arizona Pest Management Center (APMC) forwarded this request to members of the Arid Southwest IPM Network, which includes AZ, NM, NV and Southern CA participants. We also sent specific requests, via phone and email, to individuals with specific knowledge or experience in endosulfan use in affected crops.

#### **Response for Southeastern California**

Provided by ASIPM Network contact Eric Natwick, County Director and Entomology Advisor with UC Cooperative Extension.

#### **Importance of Endosulfan for IPM in Cotton and Vegetable Crops in Southern California**

Endosulfan is used judiciously for control of sweetpotato whitefly, aphid pests and worm pests on a variety of crops in California. A critical use in Southern California is sweetpotato whitefly biotype B control on cotton, cucurbit crops and lettuce. There are few options for adult whitefly control in these crops. Many insecticidal compounds are now registered for whitefly control, but their activity is primarily against the immature stages of eggs and nymphs. When whitefly adults emigrate from mature crops and weeds to new crop hosts, it is critical to control these pests with an adulticide to minimize egg deposition and virus disease transmission. Without an adulticide for control of sweetpotato whitefly biotype B, crops become quickly overwhelmed causing several problems:

- 1) Death or severe stunting of crop seedlings during stand establishment
- 2) Increased potential of virus transmission and resulting plant diseases (CLCrV, CYSDV, CuLCrV, SLCV, TYLCV, etc.) causing crop loss or failure
- 3) Increased egg deposition leading to heavy nymphal infestations
- 4) Increased of insecticide use for control of immature whiteflies
- 5) Increased potential for insecticide resistance

Endosulfan is also critical for rotation with other classes of insecticides for aphid pest and worm pest insecticide resistance management in Southern California.

Endosulfan use in the Southern California Counties of Imperial and Riverside in 2007 on Crops Grown for Human Consumption. Data source: California Pesticide Use Reporting Database.

| County           | Commodity    | Number of Applications | Pounds | Treated acres |
|------------------|--------------|------------------------|--------|---------------|
| <b>Imperial</b>  | Head lettuce | 10                     | 305    | 310           |
|                  | Leaf lettuce | 6                      | 148    | 148           |
| Totals           | All crops    | 16                     | 453    | 458           |
| <b>Riverside</b> | Broccoli     | 10                     | 107    | 214           |
|                  | Corn         | 2                      | 38     | 67            |
|                  | Cotton       | 5                      | 202    | 188           |
|                  | Melon        | 4                      | 82     | 128           |
|                  | Watermelon   | 2                      | 50     | 65            |
| Totals           | All crops    | 23                     | 479    | 662           |
| Grand Totals     | All crops    | 39                     | 932    | 1,120         |

### Response for Nevada

Earl Creech, Extension Weed Specialist with University of Nevada Cooperative Extension and ASIPM Network contact indicated that “very little” endosulfan is used in Nevada, and refrained from making specific comments on EPA’s impact assessments.

### Response for New Mexico

The New Mexico Department of Agriculture does not keep any insecticide use data, but ASIPM Network contact Tessa Grasswitz of NMSU Cooperative Extension Service contacted the three largest pesticide distributors in the state (two branches of Crop Protection Services, one in Artesia (Eastern NM – cotton & alfalfa country), one in Vada (south of Las Cruces, near El Paso (chili and pecan country), and one in Las Cruces (Helena Chemicals). According to all crop consultants with these companies, they have not sold any endosulfan for several years, and the company in Artesia checked and had no current inventory. Apparently, apart from Thionex, there is also an endosulfan ear-tag for cattle registered in NM, but we did not pursue that as it is a non-crop product.

It seems safe to assume that since no one appears to be selling endosulfan in major NM markets, that no one is using it (except for left-over product from previous years). Hence, there is not likely to be an uproar from stakeholders in NM over its demise.

### Response for Arizona

Comments provided by Dr. Peter Ellsworth, IPM Specialist, State IPM Coordinator and State Pesticide Coordinator begin on following page.

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

| <u>Rank</u> | <u>Level</u>       | <u>%</u> |
|-------------|--------------------|----------|
| 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,



Peter C. Ellsworth, Ph.D.  
 Director, Arizona Pest Management Center  
 IPM Specialist / State IPM Coordinator & Pesticide Coordinator  
 University of Arizona