Stakeholder Comment on EPA-HQ-OPP-2014-0818
Mitigation of Exposure to Bees from Acutely Toxic Pesticide Products
Arizona Pest Management Center, University of Arizona
In collaboration with the Western IPM Center
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Background & Summary

The Arizona Pest Management Center, University of Arizona, in coordination with the Western IPM Center, solicited stakeholder input on EPA's Proposal to Protect Bees from Acutely Toxic Pesticides, docket number EPA-HQ-OPP-2014-0818. Our comments are compiled based on input received from diverse agricultural stakeholders of the desert southwest, primarily from Arizona stakeholders. New Mexico and Nevada are among states with producers who reportedly had fewer than five honey-producing colonies each in 2014 (USDA 2015[1]).

In 2014, Arizona beekeepers maintained 26,000 honey-producing colonies and produced over 1 million pounds of honey valued at $2,048,000 (USDA 2015[2]). Bees are important to Arizona agriculture, supporting pollination in a number of high value crops, including melons, lemons, vegetable seed and other seed crops. In summer, bees are often maintained by foraging in alfalfa and cotton, which provide a healthy and consistent source of nutrition. Many of the 76 Active Ingredients (AIs) targeted by EPA for label changes are important tools for insect and weed management in major Arizona crops, including alfalfa, lettuces, cotton, melons, cole crops, other vegetables, corn, citrus, and tree crops. Arizona is a very important producer of high quality seed crops including lettuce seed and other vegetable seed, non-dormant alfalfa seed, bermudagrass seed and others. These and other crops such as melons and lemons rely on bees for pollination services, often under contract.

Despite the scope of the Arizona agriculture industry, and the significant use of many of these AIs, there have been very few complaints of bee kills reported. According to Jack Peterson, Associate Director of Environmental Services Division at Arizona Department of Agriculture (ADA), only one bee kill complaint has been filed in the past 10 years (in 2012, on a site that was not using contracted pollinator services). In compiling these comments, we heard many

[1] USDA. 2015. Honey. National Agricultural Statistics Service, Agricultural Statistics Board, United States Department of Agriculture. ISSN: 1949-1492. http://usda.mannlib.cornell.edu/usda/current/Hone/Hone-03-20-2015.pdf
[2] USDA. 2015. Honey. National Agricultural Statistics Service, Agricultural Statistics Board, United States Department of Agriculture. ISSN: 1949-1492. http://usda.mannlib.cornell.edu/usda/current/Hone/Hone-03-20-2015.pdf

examples of good communication practices among growers, pest control advisors, and beekeepers. This communication, along with best management practices, such as nighttime sprays to minimize bee exposure, have been effective, as evidenced by the very low number of bee kill incidents reported over the years in Arizona. This is also further evidence that many to most of the AIs covered under this comment are inherently very low risk with respect to bee toxicity when used according to current label requirements.

Growers and pest managers we spoke with identified several potential negative impacts of the proposed label changes on agricultural production, pest management, and the economic well being of growers and beekeepers. Some pointed to potential unforeseen negative consequences that could be detrimental to bee survival in Arizona cropping systems, and to IPM programs in general.

Issues identified included:

1. Concern about the loss of important pest control tools.
2. Economic harm to growers expected to result from the proposed label changes.
3. These products are now effectively and safely used in many crops without harming bee populations.
4. This proposal will not only affect growers who are contracting for bee services; it will impact other growers.
5. The proposed regulations, despite the intent, will likely result in negative outcomes for bees, beekeepers, and the agricultural industry in general in Arizona. Bees will be harmed and have less harborage in agricultural areas of Arizona.
6. A litigious, rather than cooperative, culture will result; complaints will be litigated in the courts and divert resources from SLAs responsible for human and environmental safety.
7. Potential negative impacts on crop production and Integrated Pest Management (IPM).

Process for Soliciting Comments

The Arizona Pest Management Center (APMC) requested input from Extension Specialists and County Agents, growers, pest control advisors, beekeepers and other stakeholders, including contacts in AZ, CA, NM and NV. We drafted a summary of EPA's proposed changes with links to the docket and sent it out via multiple email lists in AZ and southeast CA. This solicitation for stakeholder input was also featured in an article in Western Farm Press with readership in the 10's of thousands throughout the West. We followed up with telephone and face-to-face discussions with several PCAs and growers. In addition, we queried the APMC Pesticide Use Database, which contains pesticide applications reported to the Arizona Department of Agriculture for a subset of AIs on EPA's list known to be important in major Arizona crops. We also solicited the SLA for any records or reports they had with respect to bee complaints in agriculture. We have summarized important stakeholder comments and relevant data below, organized around key issues we identified.

Key Issues and Stakeholder Comments

1. There is real and genuine concern about the loss of important pest control tools.

According to one experienced Arizona grower, the list of AIs targeted for label changes, "includes the active ingredients of at least 75% of the insecticidal products currently in use here as well as quite a few herbicides and fungicides also used quite frequently in our area." The PCAs and growers we spoke to expressed concerns that few tools would be left to effectively manage pests in crops contracting for pollinator services (and other crops, see below). One grower of crops that do not use contracted pollinator services commented, "The products that currently have label restrictions for bees, we simply don't use them. If the same approach is adopted for this list of AIs, we will not have any chemistries left to control insects!"

Many of the 76 Active Ingredients (AIs) targeted by EPA for label changes are important tools for insect and weed management in major Arizona crops. An analysis of the Arizona Pesticide Use Database for 2014 for a subset of 11 listed AIs (9 insecticides and 2 herbicides), plus the chemical class pyrethroids, revealed 510,000 acres of alfalfa were treated with these AIs, over 440,000 acres of lettuces, 228,000 acres of cotton, 68,000 acres of cole crops and 41,000 acres of melons. EPA's list of AIs includes the top 3 chemistries used for pest management in Arizona fall and spring lettuce crops (pyrethroids, spinetoram and imidacloprid, with 83–98% of acres treated in 2014–2015 season)[3]. Other crop groups with significant usage of these AIs include corn, other vegetables, citrus, and tree crops. Despite the scope of the Arizona agriculture industry and the concomitant beekeeping industry, and the significant use of many of these AIs, there have been almost no reported incidents of alleged bee kills[4].

The availability of safe and effective tools and tactics for controlling economically damaging pests is a central tenet of Integrated Pest Management (IPM). IPM has seen a renaissance in Arizona, largely because of the rapid development of reduced-risk insecticides over the past two and half decades. These products have largely replaced more broadly toxic organophosphates, carbamates, endosulfan, and pyrethroids. These changes have enabled the key ecosystem service of biological control in systems where 30 years ago womb to tomb spraying was the norm. Growers of cotton and alfalfa, in particular, now regularly and actively manage predators and parasitoids as well as other beneficial organisms. Conservation biological control is a central feature of the cotton IPM programs of the desert Southwest. All of these practices, including the chemical tools used, have served to create a more favorable habitat for honeybees and native pollinators. This rule will either force growers to use alternative pesticides that will likely be

[3] Palumbo, J.C. 2015. 2015 Insecticide Usage on Arizona Lettuce. Vegetable IPM Update. University of Arizona Cooperative Extension. Vol. 6 No. 12. http://ag.arizona.edu/crops/vegetables/advisories/docs/061015_Insecticide_Usage_Summary_in_Lettuce_2015.pdf

[4] Jack Peterson, Associate Director of Environmental Services Division of the Arizona Department of Agriculture, personal communication, 8/27/15. One bee kill complaint was filed with this state lead agency in the last 10 years (2012). It did not involve contracted services, but hives placed in an area unknown to the landowner or the cotton grower.

broadly toxic and unfavorable to conservation biological control, or force them out of business. IPM cannot stand without specific and strategic use of remedial and curative chemical tools. This proposed rule is potentially damaging to two decade's worth of IPM development in our region.

2. Potential economic harm to growers is likely to result from the proposed label changes.

Unlike previous requests for stakeholder input on proposed label changes or cancellations, this call for public comment does not pose questions to growers about whether effective alternative pest management tools are available for the crops that will be impacted by these changes. The economic well being of the growers has generally been considered to be of importance in the past. Indications from our stakeholders are that few tools will be left to manage pests in many of the affected crops. A PCA who works with Arizona melon growers said, "If we are unable to use [these] pesticides after bloom starts we will be unable to deliver a quality crop after mid summer most years. If we have no chance of growing a profitable crop then the bees will have nothing to pollinate. This proposed rule is a drastic, misinformed measure that is not necessary, **nor will it achieve the intended results**. It will put many farmers and beekeepers out of business." Previous label language, such as "do not use when bees are actively foraging" provided more flexibility in still making use of these products while at the same time protecting bees. The newer language is more restrictive and will disallow use of products containing these AIs at times when they are needed to bring a marketable crop to harvest. As currently worded, there will be a complete loss of these tools for crops of indeterminate bloom, such as melons. PCAs and growers alike expressed some frustration about the extent and potential detrimental economic impacts of the proposed label changes, in part because things are working so well now. They have the tools they need to manage pests and bees are not being negatively impacted by their pesticide use practices (see next).

3. These products are now effectively and safely used in many crops with existing means of communication among growers, beekeepers and pest managers.

Good communication among beekeepers, growers and pest managers about hive placement, pesticide selection and application method and timing is important to all parties, and has been working well, according to most Arizona agricultural stakeholders we heard from. According to one PCA who works in melons with contracted bee services:

> *"Over the years we have applied more than a dozen of the listed active ingredients. We have had to apply some of them quite extensively in order to get the crop to harvest. We realize that we will have no crop if we kill the bees and therefore we only apply pesticides when necessary. We have worked very closely with our beekeepers and have never had a significant bee kill. We always apply chemicals after dark when the blooms are closed and finish before they open in the early morning. By doing this every time we have been able to use these active ingredients responsibly and without adversely affecting our pollinators.* ***We have been managing this issue for 30 plus years to the satisfaction of both the***

growers and the beekeepers. It can be done successfully without additional rules put in place by EPA."[5]

Other PCAs gave similar examples of practices in place to protect bees, and commented that they are working well. Good communication between the pest manager and the beekeeper is critical and is part of the routine in the business. Another PCA commented, "If a beekeeper is across the way [in neighboring fields], I go out of my way to provide 24 hour notice if I need to spray." An Arizona PCA who works with lemon growers who use pollinator services said, "We do nighttime applications and stay away from the edges of fields. I spend hours talking to the beekeeper about what we will spray."

The Arizona Department of Agriculture (ADA), the state lead agency, has been working with stakeholders to develop a Management Plan for Protection of Pollinators (MP3), a draft of which is now available for public comment. Comments from ADA on this EPA proposal suggest that the proposed label changes are premature and should not be implemented until there has been sufficient time to implement and assess the success of the MP3 in Arizona.

The USEPA has made claims that bee incidents have been underreported to SLAs and others. The specific reasons for the underreporting are unclear. However, there is no basis for this assertion for the regions covered by this comment. It is hard to imagine that if there were a significant economic loss involved that such incidents would not be reported to authorities. In Arizona, only one such claim has been made in the past 10 years to the SLA[4]. This, however, is not the only source for understanding difficulties in the beekeeping industries as related to the agricultural industry. Cooperative Extension is the technology transfer and educational outreach arm of the University of Arizona with no economic or regulatory interests in bee incidents. Those Extension Specialists responsible for IPM development and delivery in Arizona have the occasion to speak with stakeholders regularly about any concerns they have regarding bee health, bee safety, or crop production dependent on pollination services. Stakeholders can seek consult with these experts in IPM without fear for retribution, regulatory scrutiny, or other forms of undesirable peer pressure. As such, their observations on the frequency of bee incidents in the state of Arizona are telling.

Dr. John Palumbo who helps the development of cucurbit IPM programs has noted that, despite significantly increased pesticide practices in melons to prevent transmission of CYSDV by Bemisia whiteflies, there have been no reports of problems with bees, their hives or for the beekeeping industry contracted for pollination services for these melons.[6] Furthermore, Dr. Palumbo notes that he has communications with stakeholders about bee health / safety about 1–2 times per year. These are discussions that support stakeholders in the selection and safe use of pesticides used in flowering crops and related best practices issues. Despite these regular

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[5] Comments submitted to this docket on behalf of pest control advisor Mike Arbogast, comment tracking number 1jz-8kr8-2rbv.

[6] Dr. John Palumbo, IPM Specialist, University of Arizona, personal communication, 8/28/15. Dr. Palumbo also provided input to a comment submitted by the Yuma Fresh Vegetable Association, comment tracking number 1jz-8k9b-1mvw.

communications with stakeholders, Dr. Palumbo is aware of only two adverse bee incidents in more than decade.

Similarly, Dr. Peter Ellsworth who develops cotton IPM programs for Arizona interacts with stakeholders regularly regarding bee health and safety with respect to pesticide and other pest control practices. On average, Dr. Ellsworth receives inquiries about bees about 4 times per year. These discussions centered around pesticide selection, spray timing and other practices, and communications with beekeepers. Similar to observations of others, Dr. Ellsworth has only been aware of two negative bee incidents in the last 16 years, both involving applications related to cotton pest control.

Given the dearth of evidence for a chronic and widespread problem in Arizona — a place with a very large beekeeping industry, many flowering and other crops in need of pollination services, and at times very intensive and year-round pesticide practices — it appears that the USEPA has developed proposed rules for a problem that does not exist here. This is not to say that there are not improvements that could be made and the USEPA should follow-through on its support of state initiatives to develop MP3s. Perhaps with better and more uniform reporting, the USEPA will become more informed about pesticide practices, contractual agreements involving growers and beekeepers, and any real and perceived issues for bees.

The following section reveals concerns of stakeholders regarding the unintended consequences of these additional regulations and supported by APMC analyses of pesticide use and grower behaviors.

4. Unintended Consequences 1: This proposal will not only affect growers who are contracting for bee services, it will impact other growers.

While the intent of the proposed changes is to impact situations where growers are contracting for pollinator services, comments from stakeholders clearly indicated that neighbors and other growers would be impacted by the changes as well. Bees do not recognize farm boundaries and neighbors of those growers contracting for services will be compelled to change their spray practices as well, to their own economic detriment. Grower: “This affects neighboring growers. If the bees decide to leave the crops they are contracted on, they could potentially be impacted by insecticides used on neighboring crops.” Since pollinator services are cost effective only for high value crops, neighbors growing cotton or other lower value crops would be compelled by the neighboring growers contracting the services to change their spray practices.

5. Unintended Consequences 2: Bees will be harmed and have less harborage in agricultural areas of Arizona.

Bees are maintained during much of the year in crops that do not contract for pollinator services, including (in Arizona) cotton and alfalfa. Bees benefit by foraging in these nutrient-rich crops, and in the past growers have been agreeable to the presence of the bees on or near their property. Growers of these crops have expressed concerns about the proposed label changes and potential liability for use of these pesticides if bees are present (see next point). In the past, bees have been

left on grower's land by verbal agreement, which might be interpreted as a contract under the proposed label changes. (It was stated on an EPA public webinar on June 23 that the phrase "under contract" would also apply to verbal agreements between growers and beekeepers.) This will make it tough for the bees to survive between contracts in Arizona. Arguably, a grower who permits bees to be harbored on or adjacent to their property has not engaged in a contract for "pollination services". Nevertheless, many growers are risk averse and have already stated that they will forgo this practice in the future. This action will severely limit harborage and foraging opportunities for bees in Arizona. It will also force beekeepers to turn to artificial means to nourish their bees. This very practice has been called into question as a key feature in colony health.

6. Unintended Consequences 3: A litigious, rather than cooperative, culture will result; complaints will be litigated in the courts and divert resources from SLAs responsible for human and environmental safety.

Because of the breadth of this rule, the extensive list of AIs involved, and the broadest of definitions for contracted agreements, growers, beekeepers, and regulators will be tied up in courts litigating the biology, ecology, and management of bees. This will divert resources from all parties that would be better invested in cooperative, collaborative, and educational efforts (such as the proposed MP3s) that might better secure bees, the beekeeping industry, the allied agricultural industries. This intrusion into contract law will be challenged by others, who otherwise simply wish to establish or preserve good working relationships between grower and beekeeper. Furthermore, **the very act by USEPA of placing this diverse set of AIs all in one list to suggest equal risks to bees is counter to the science-based mission of USEPA and fuels ill-considered and uninformed debates about these pesticides.** This will embolden 3rd party actions and law suits any time a member of the public wishes to advance a self-serving or punitive agenda against agriculture, SLAs, or the USEPA.

The APMC has analyzed grower behaviors and pesticide use patterns in Arizona agriculture and found extremely broad and frequent usage of many AIs in the list, some for more than 20 years. At the same time, APMC entomologists, who address questions and field informal inquiries daily, have reported no unusual patterns of beekeeper complaints or other bee incidents. Most inquires made by stakeholders to Cooperative Extension involve learning more about procedures and chemical tools that can be used safely without harm to neighboring crops or the bees contracted there for pollination services.

7. Unintended Consequences 4: Potential negative impacts on crop production and Integrated Pest Management (IPM).

In comments submitted separately to the EPA[7], Entomology Farm Advisor with University of California Cooperative Extension, Imperial County, Eric Natwick, provides examples of unintended consequences of broad bans or restrictions of insecticide use by government agencies

[7] Comments submitted to this docket on behalf of Entomology Farm Advisor Eric Natwick, comment tracking number 1jz-8krx-493j.

in Europe and Saudi Arabia, which resulted in "negative impacts on the cost of crop production, increased risk to the environment, increased risk to people and disruption of IPM programs." He concludes, "The wide reaching action of restricting use of insecticides in such crops when bee services are contracted is very likely going to have foreseen and unforeseen negative impacts on crop production, negative impacts on the environment and negative impacts on human health and on IPM programs." One grower I talked to concurred, saying that this proposal **will negatively impact food production** at a time when we need to increase food production to meet growing demands.

Pesticide Use Patterns in Arizona

Arizona Pesticide Use Data Document Significant Use of Several Active Ingredients with Proposed Label Changes.

The Arizona Pest Management Center (APMC) maintains a database of agricultural pesticide use in Arizona, based on use reports submitted to the Arizona Department of Agriculture in accordance with state regulations. This includes all "custom" or for-hire applications and aerial applications, but does not include many grower-applied pesticides, for which reporting is not required. An analysis of 11 active ingredients (acephate, acetamiprid, besulide, cyantranilaprole, dinotefuran, diuron, imidacloprid, indoxacarb, spinetoram, spinosad, and sulfoxaflor) and one chemical class (all pyrethroids combined) showed significant use across major Arizona crops. Yet, there is a dearth of evidence of any kind of widespread problem with respect to bee health and safety in Arizona.

Figure 1 shows use from 2000 to 2014 as total acres sprayed by active ingredient for major crops (alfalfa, cotton, lettuces, melons and all crops combined). Despite the scope of the Arizona agriculture industry and the concomitant beekeeping industry, and the significant use of many of these AIs, there have been almost no reported incidents of alleged bee kills.

Notes to Figure 1

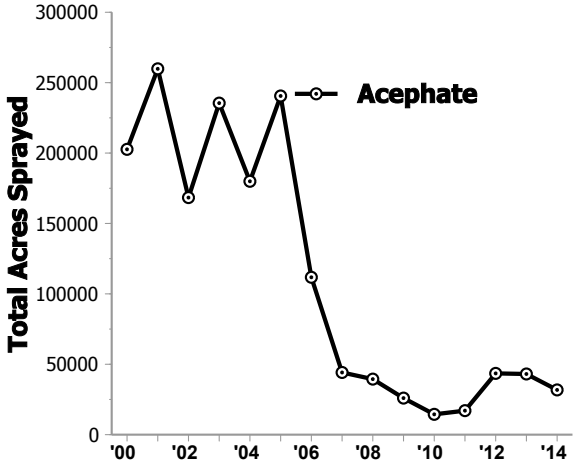
"All Crops" depicts the reported usage for the aforementioned AIs that are deemed very important to agricultural producers in this state. Acephate use has greatly declined since 2006 when the reduced-risk feeding inhibitor, flonicamid, was registered for use in the control of *Lygus hesperus* in cotton (also see cotton charts). Acetamiprid use has moderated over the last few years as other whitefly and aphid active options become registered or lowered in price. Pyrethroid use is up heavily in recent years due to a plethora of factors, demonstrating the wide utility of this important class of chemistry in controlling the invasive Bagrada bug, in attempts to overcome large influxes of the brown stink bug, and in addressing widespread and historic aphid outbreaks in alfalfa. Bensulide use is steady and a key soil-applied herbicide with no real exposure risk for bees — experts wonder why this AI is on USEPAs proposed list. Dinotefuran is another soil-applied and foliar insecticide with utility for whitefly and aphid control. Spinetoram usage has increased and replaced much of the spinosad usage in Arizona.

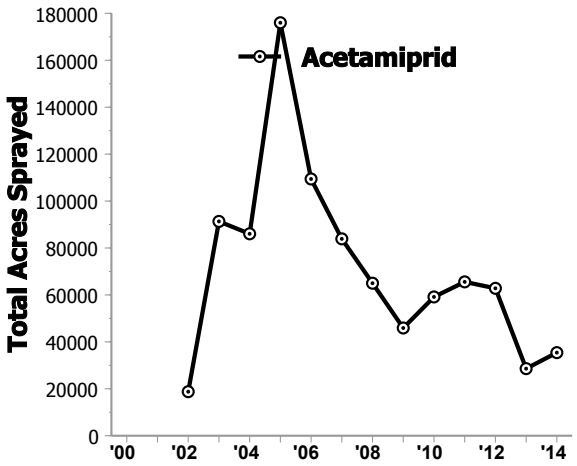
"Melons" includes many members of the musk melon family as well as other melons that are typically grown in two seasons in Arizona and reach very strategic and valuable market windows. The most significant challenge to melon production is CYSDV, a yield and quality-robbing viral disease transmitted by Bemisia whiteflies. Dinotefuran and acetamiprid are two important whitefly insecticides that are needed to accomplish commercial production of melons in Arizona. Despite significant usage of these and other pesticides and the large interaction with the bee industry through contracted services, there have been virtually no complaints regarding bee health or safety. Growers work directly with their beekeeping industry.

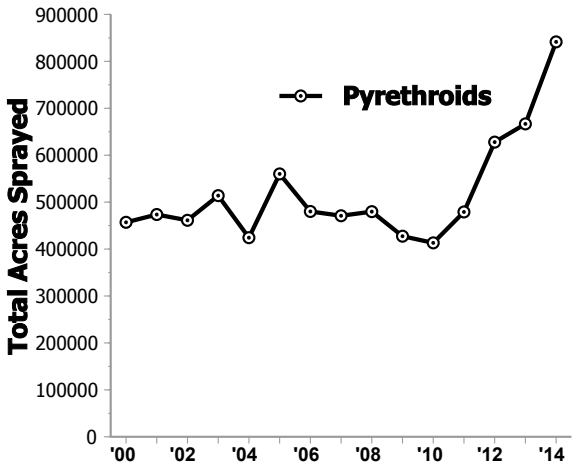
"All Lettuces" represent the wide array of lettuce crops grown in the winter in Arizona and that supply leafy greens to the entire country for nearly 6 months. While not a flowering crop, there are parts of Arizona where flowering crops and crops requiring pollination services are in close proximity to lettuce fields. As well, lettuce pesticide use patterns are a representative example of the pesticide practices used to grow many different kinds of vegetable crops in Arizona. Please refer directly to a more complete dataset on grower pesticide practices available in Palumbo 2015, cited in footnote 3.

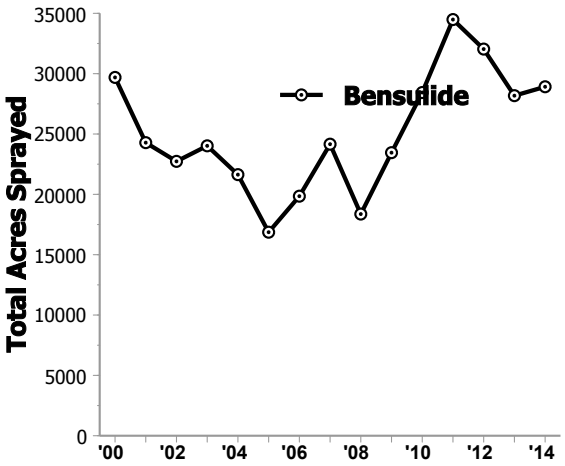
"Cotton" does not require pollination services; however, as one of the two most dominant summer flowering crops in Arizona — the other being alfalfa — bees are often harbored nearby and might make use of cotton and adjacent lands as a summer forage. As already mentioned acephate usage has drastically declined since flonicamid (2006) and sulfoxaflor (2013) have been registered for the control of Lygus hesperus. Unfortunately the latter is on USEPAs proposed list. This AI enables a much-needed rotation with flonicamid to avert selection pressures for resistance. Lygus hesperus, incidentally, is a major seed feeding insect in many of our high value seed crops that do require pollination. Acetamiprid is the only insecticide that gives producers the opportunity to control whitefly adults along with immatures. The other alternatives are excellent but only directly effective on the immatures. Thus, when whiteflies are migrating across the landscape, acetamiprid is often the only option a cotton grower has to prevent losses due to this insect. Whiteflies have the capacity to destroy the cotton industry should the region ever be associated with "sticky" cotton caused by the honeydew excreta of this animal contaminating cotton fiber. Pyrethroids saw a brief resurgence as producers attempted to control brown stink bug outbreaks and underscore the broad utility of this class of chemistry any time a major, new arthropod pest breaks out or invades our region.

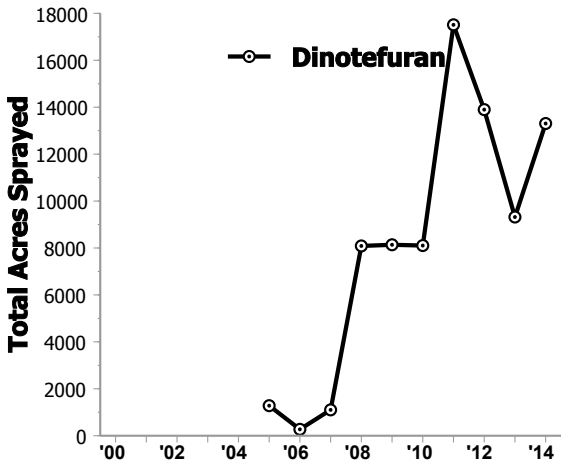
"Alfalfa" is the other major summer, flowering crop that is available for foraging bees and other pollinators. Pyrethroid usage spiked in the last two years because of historic outbreaks of aphids there. Some forage alfalfa is "converted" for seed production during the summer, when it becomes very attractive and susceptible to Lygus hesperus. The damage caused by Lygus can ruin a seed crop. Alfalfa seed growers often contract with honeybee providers as well as with leafcutter bee providers. They have cooperated for generations in Arizona to develop control regimens that have little or no impact on these valuable pollinators.

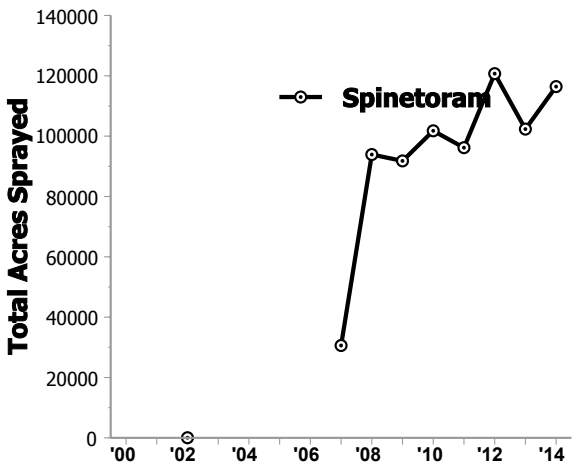


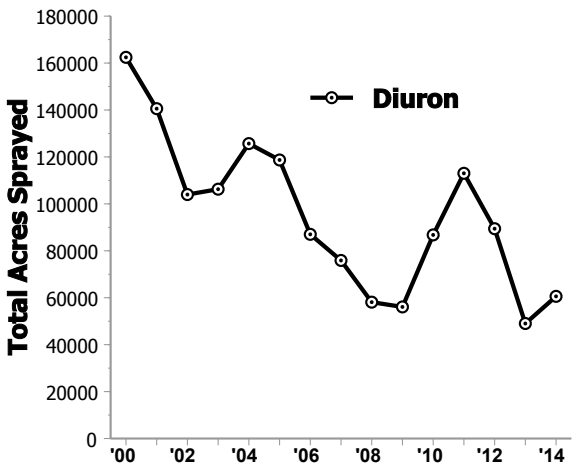


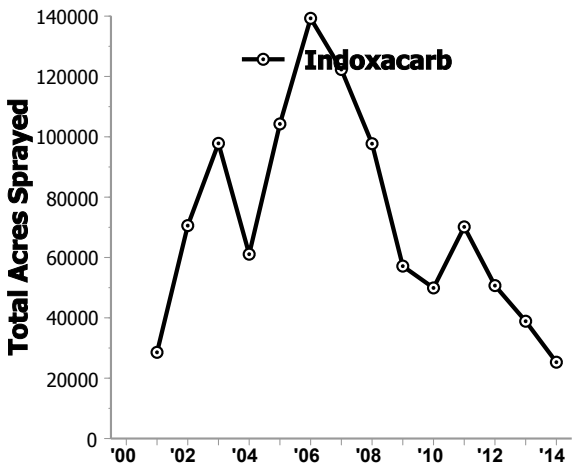


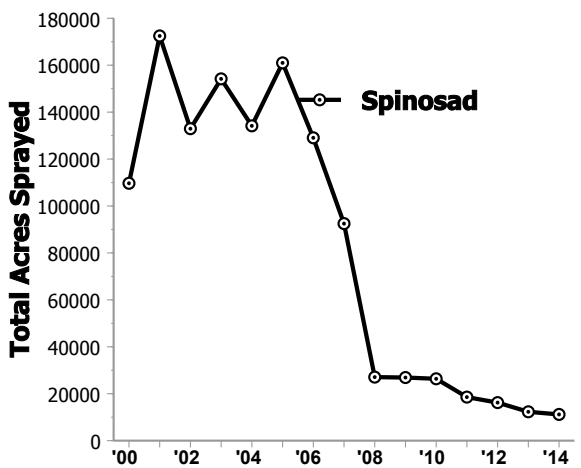




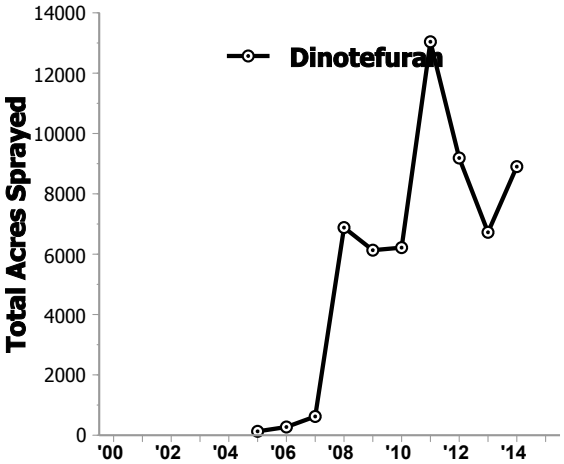


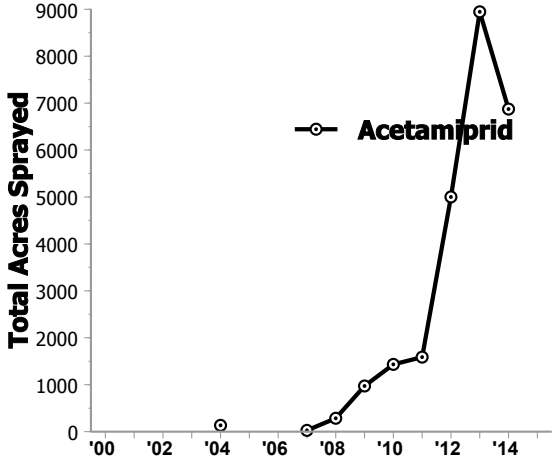


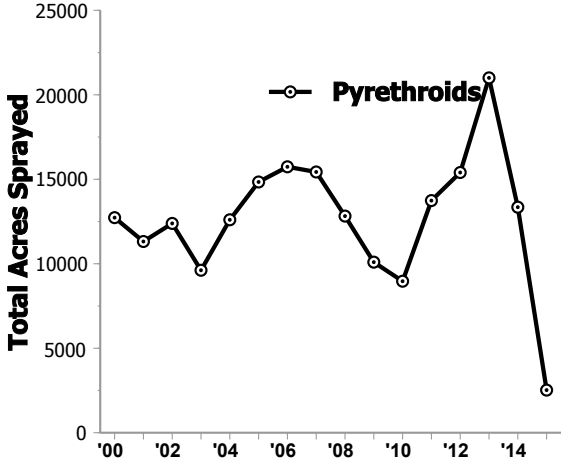


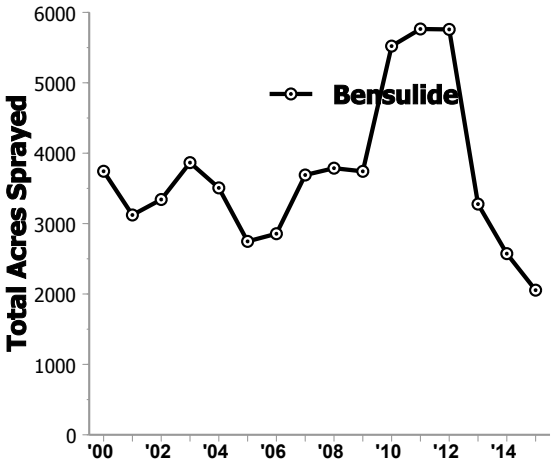


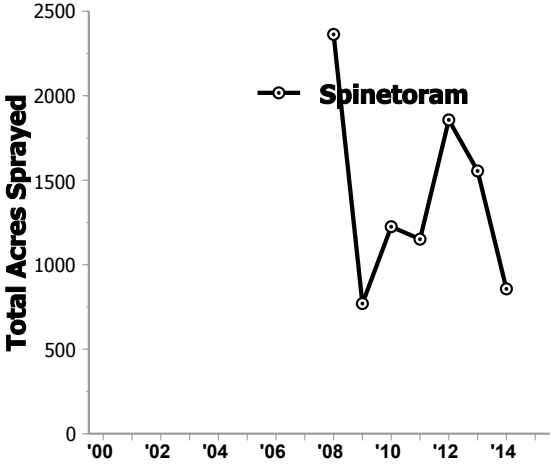
Source: APMC PUD, 8/2015, All crops; University of Arizona

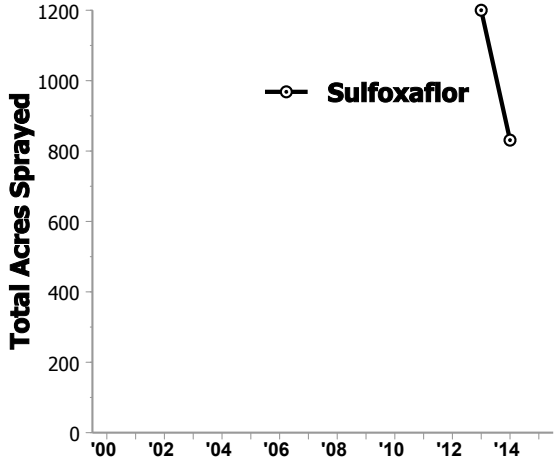


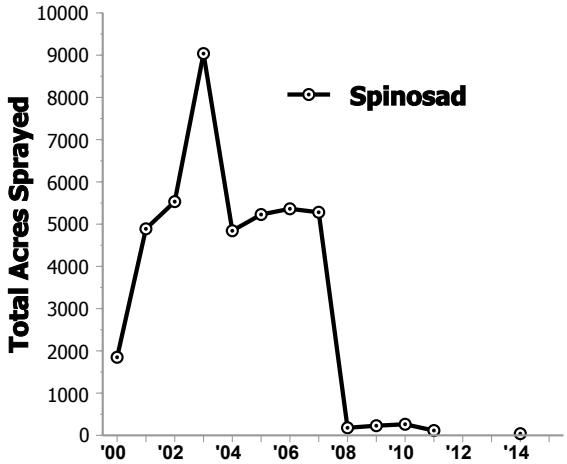




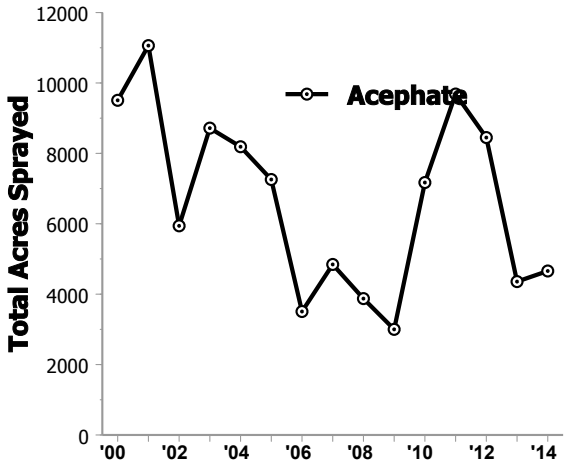


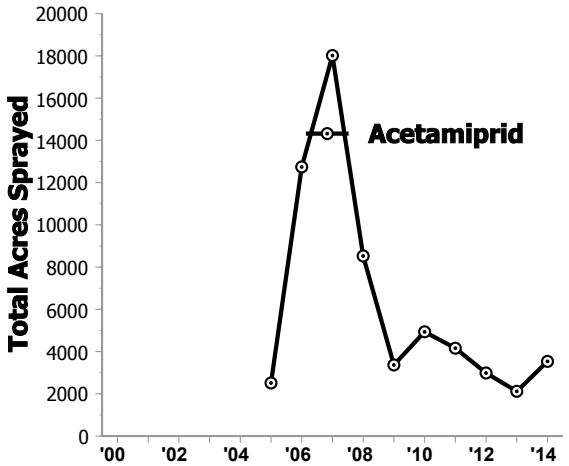


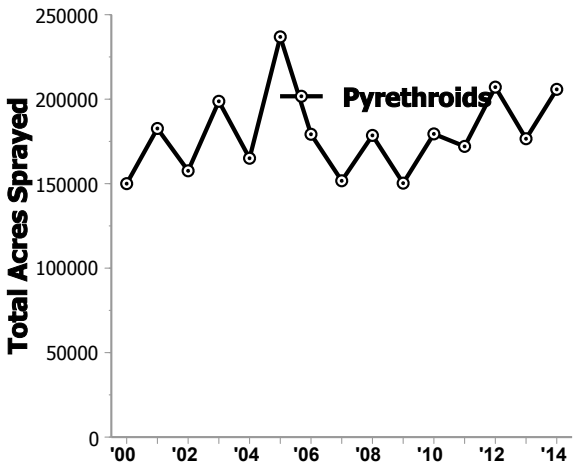


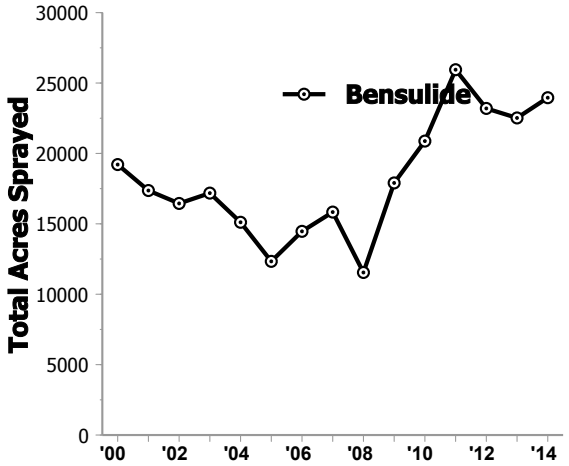


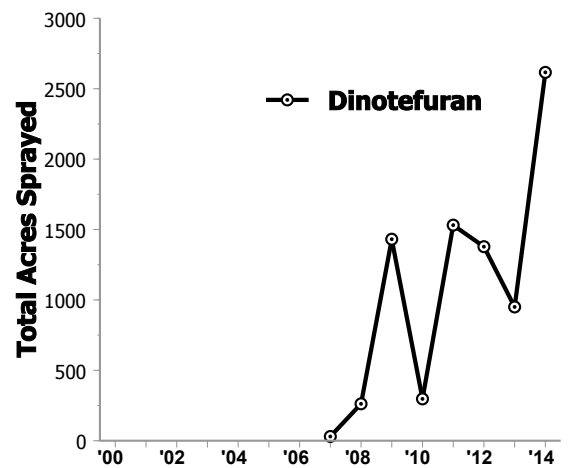
Source: APMC PUD, 8/2015, Melons; University of Arizona

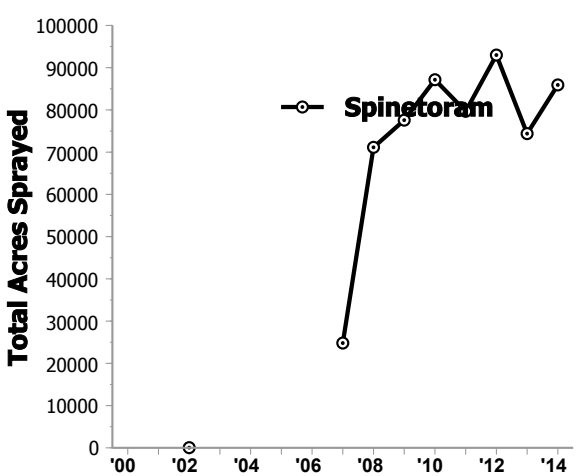


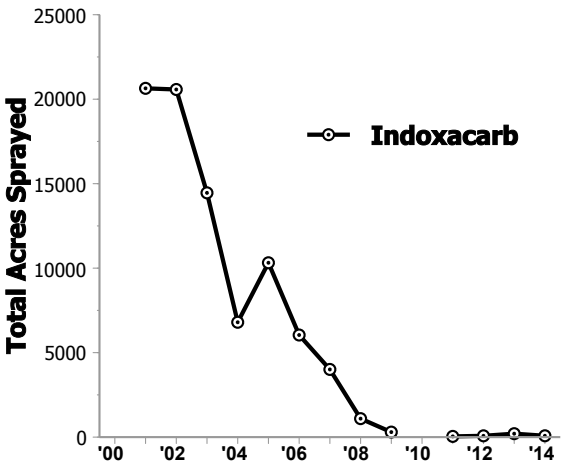


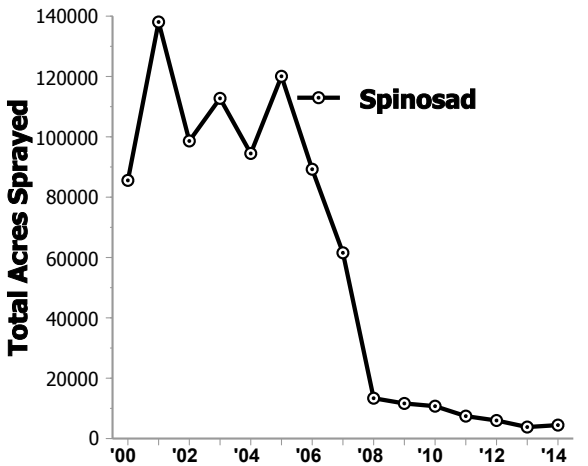


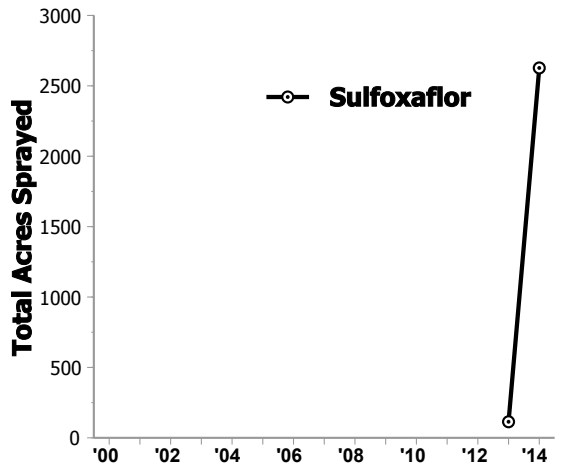




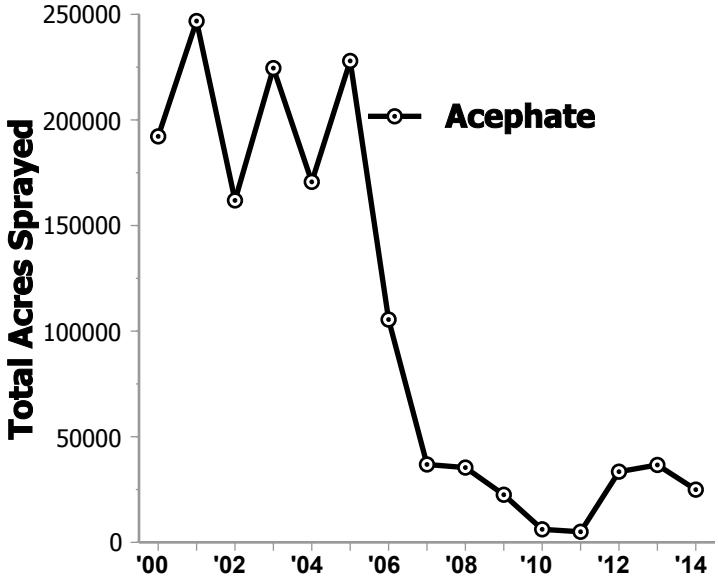


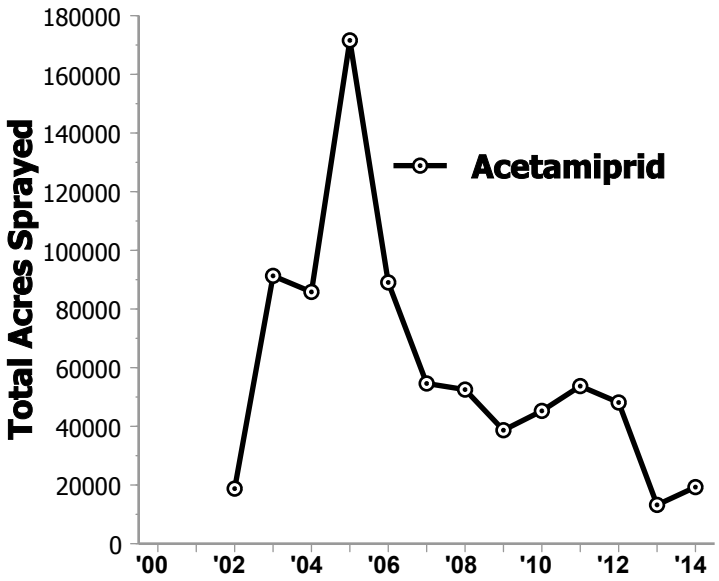


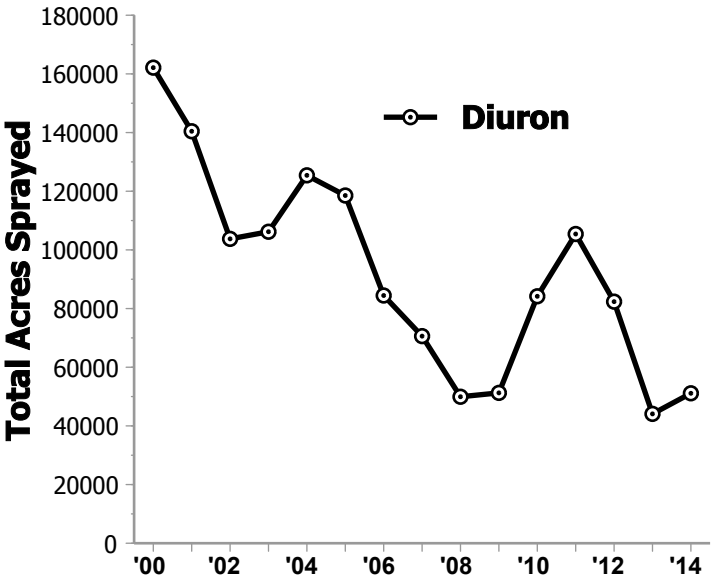


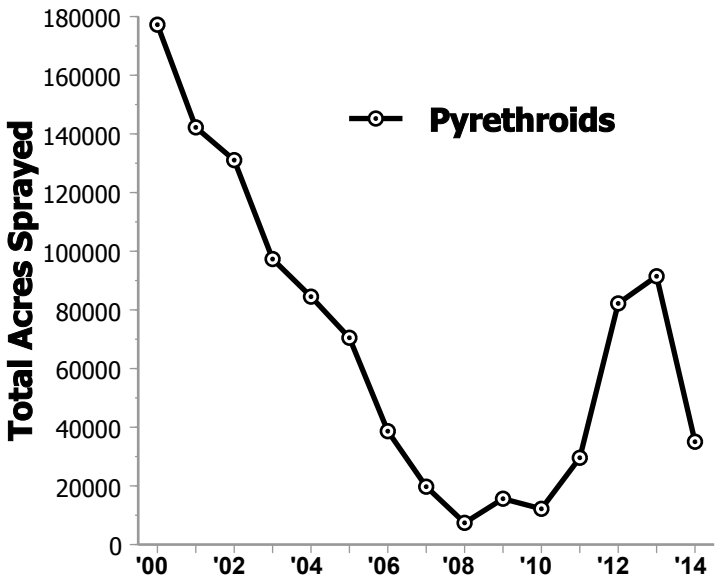


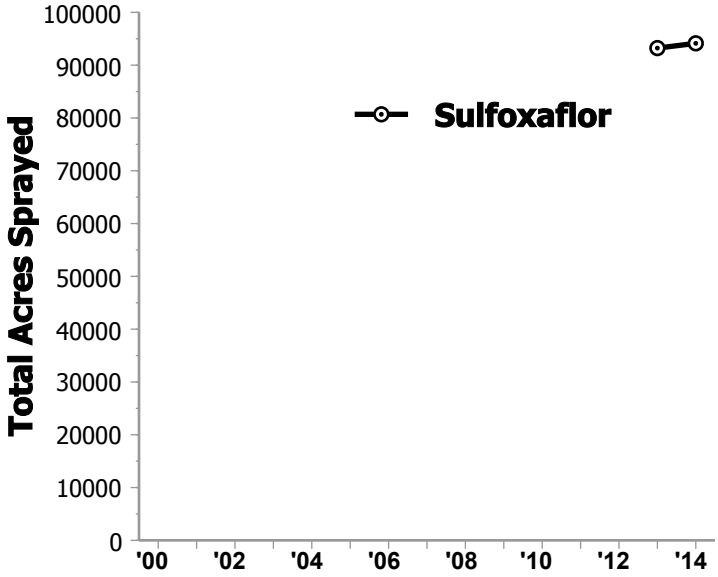
Source: APMC PUD, 8/2015, All lettuces; University of Arizona



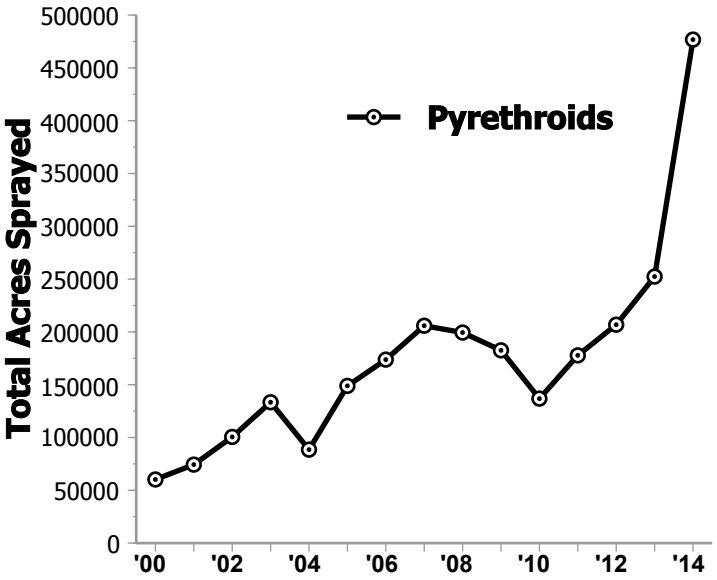


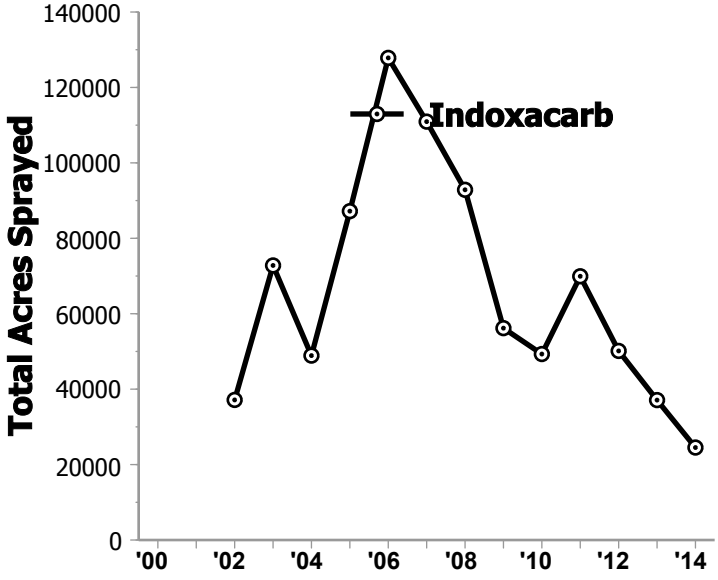






Source: APMC PUD, 8/2015, Cotton; University of Arizona





Source: APMC PUD, 8/2015, Alfalfa; University of Arizona