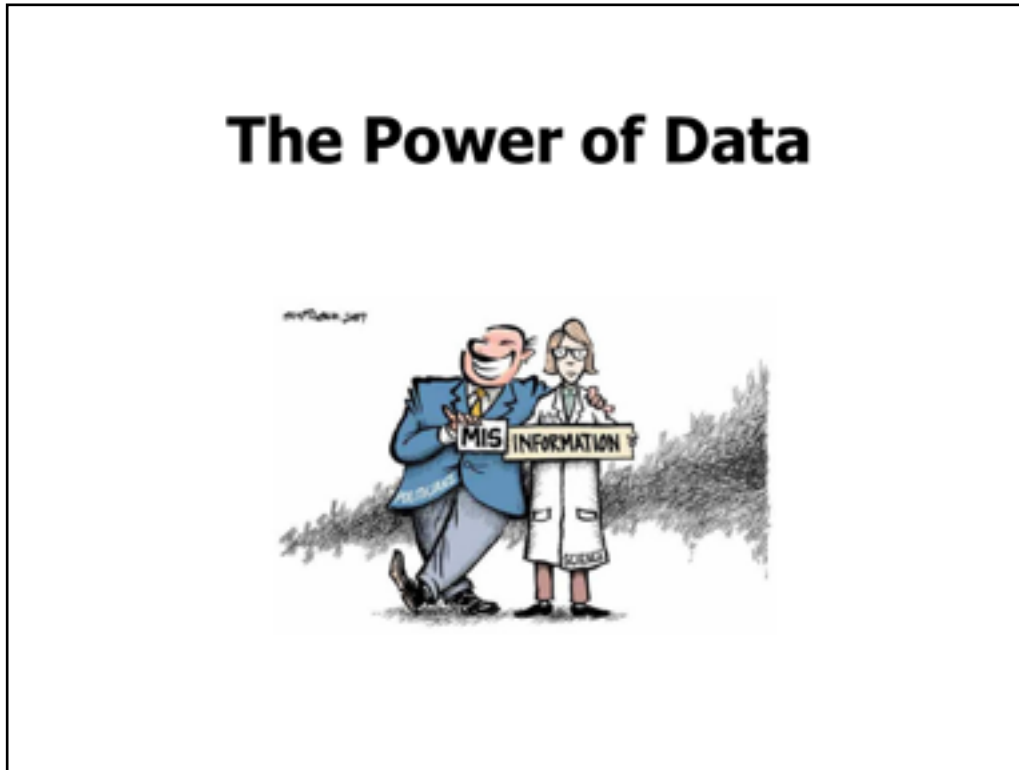


Better Pesticide Use Data Means Better Resources for Growers

Broad Spectrum Insecticides (sprays / A)

- 94% reduction in pyrethroids
- 85% reduction in carbamates
- 82% reduction in OP's
- 67% reduction in endosulfan
- 62% reduction overall in broad spectrum
- 62% reduction in all insecticides

Al Fournier, Peter Ellsworth, Wayne Dixon & Naomi Pier



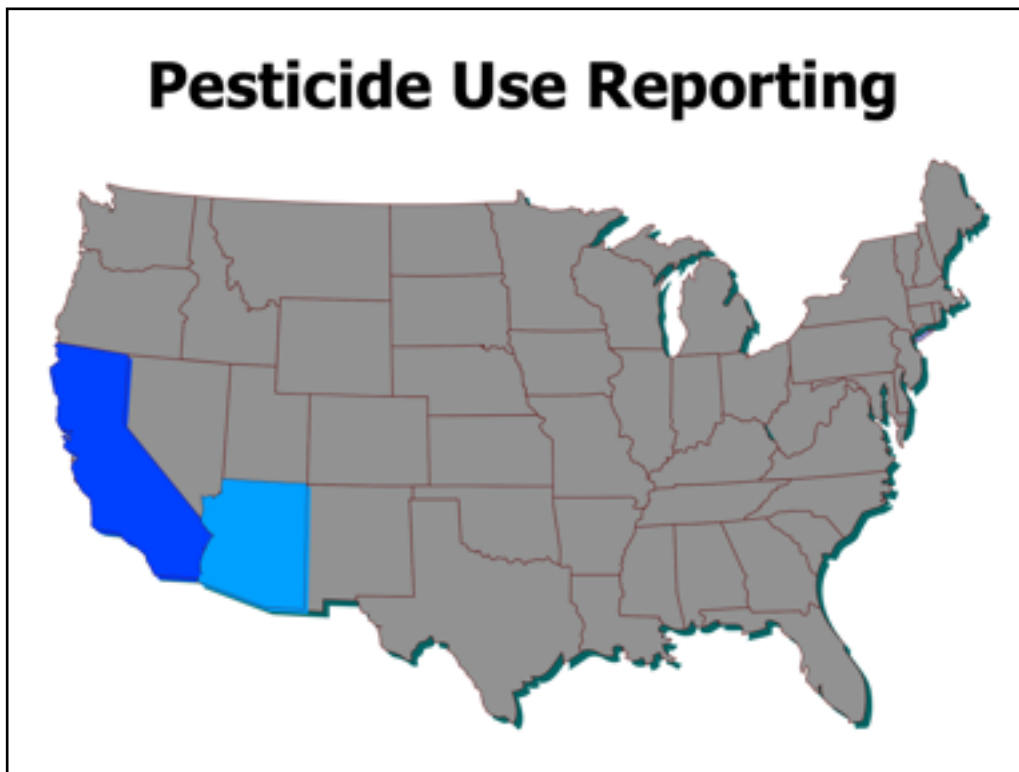
Increasingly, it seems like we live in an era where perception is more important than facts. This is apparent in situations where legislation and political forces rather than science seem to be driving decisions about which pesticides should be available to farmers. Recent examples include EPA revocation of all tolerances for chlorpyrifos, an organophosphate in use since 1965, and cancellation order for all previously registered sulfoxaflor products on November 12, 2015, This cancellation order is in response to the September 10, 2015, order of the Ninth Circuit Court of Appeals. Without REAL DATA on how these chemistries are used and why they are important to growers, we are all but powerless. Whether you know it or not, The Arizona Pest Management Center is working hard to respond to these proposed changes in regulation with REAL DATA, much of which all of you provide to the state in the form of 1080 use reports and/or through our crop pest losses and impact assessment program workshops.

Value of Pesticide Data

- Provide real data to support registration reviews & policy decisions that affect AZ crops
- Educate growers, PCAs, Extension colleagues and others about AZ pest management
- Evaluate impact of new technologies and IPM
- Document long-term pesticide use trends that reveal a progressive industry and active environmental stewardship
- Increase funding for IPM research & education



Access to accurate agricultural pesticide use data allows us to defend useful and important chemistries on behalf of Arizona agriculture. The data also inform education and outreach, and allow us to analyze long term trends and secure competitive grant funds to address pest management problems.



It might surprise you to learn that AZ along with CA are the only states that have active programs for agricultural pesticide use reporting. These data simply do not exist elsewhere. California has 100% use reporting while Arizona does not. Mostly, EPA and others rely on grower surveys or distributor sales data to estimate pesticide use. These data sources can inaccurately represent what growers are doing on the ground. Unfortunately, for most states these are the best data available.





Arizona Data Resources

- **APMC Pesticide Use Database**
 - ~25 years of AZ use records
 - From state use reports (ADA)
 - Verified, corrected data
 - Searchable database (all crops)
 - Up to date
 - Integrated with other useful information

- **Crop Pest Losses Surveys**
 - Impact assessment: pests, pesticides and economics
 - Real world data developed by PCAs
 - AZ statewide (+ S.E. CA)
 - Lettuce, Cotton, Melons
 - Unique insights into the intent of sprays made




We use two major sources of Arizona pesticide use data. The first resource is the Arizona Pest Management Center (APMC) pesticide use database, which contains all applications reported to Arizona Department of Agriculture. The second resource is the Crop Pest Losses surveys we conduct in lettuce, cotton and previously in melons with funding through the Western IPM Center Signature Program.




Examples

How we use (1080) Pesticide Use Report data




Pesticide Info Requests

- Since 2006, the APMC has responded to over 50 federal requests, including...
- 2,4-D, Carbaryl, dimethoate, endosulfan, imidacloprid, maneb, methomyl, spirotetramat, dicrotophos, soil fumigants, Sulfoxaflor, chlorpyrifos, **pollinators**
- Reports include data from 1080 reports, crop pest loss surveys and end-user comments




The University of Arizona,
ARID SOUTHWEST IPM NETWORK
COOPERATIVE EXTENSION



cals.arizona.edu/apmc/Arid_SWPMC_Info_Requests.html

We monitor EPA registration reviews and other calls for public comment and examine the Pesticide Use Data to identify chemistries that may be important to Arizona agriculture. We then gather input from growers, PCAs and other stakeholders to document how and why a chemical is used and whether viable alternatives are available. The combination of real Use Data and stakeholder comments carry weight with EPA. We know of several cases where uses were retained in Arizona as a result of our comments.

Central Experiment Station
Cooperative Extension



THE UNIVERSITY
OF ARIZONA

COLLEGE OF AGRICULTURE
AND LIFE SCIENCES
COOPERATIVE EXTENSION
Arizona Pest Management Center

37860 West Smith-Linko
Maricopa, Arizona 85133
FAX: (520) 568-2556

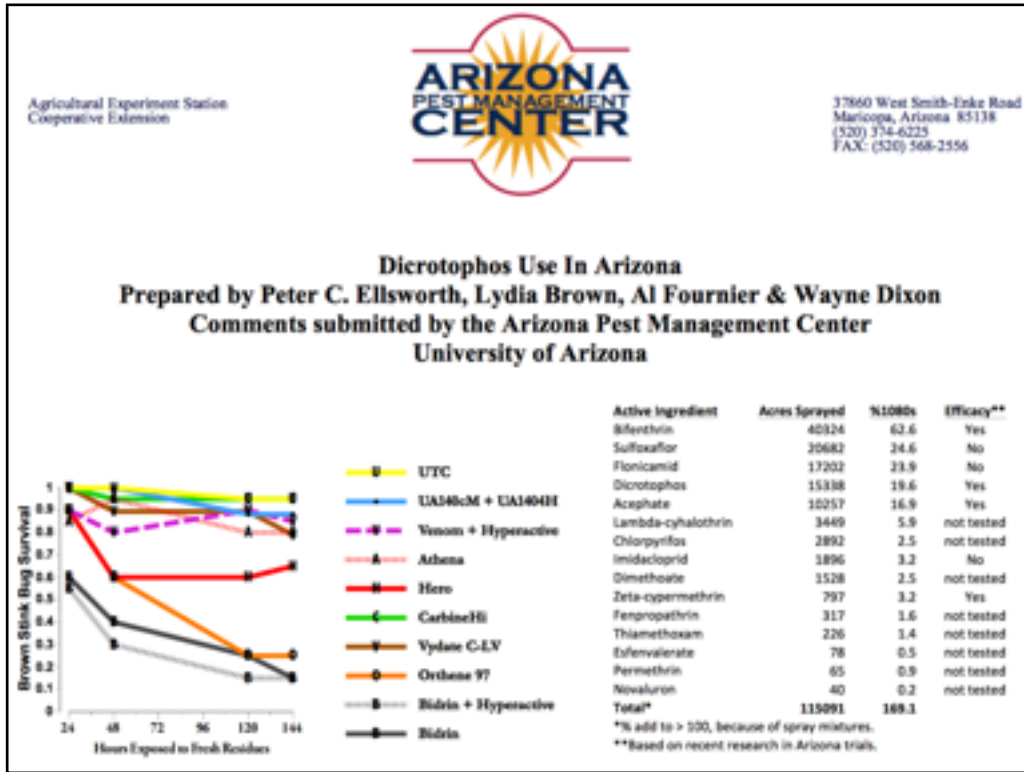
Chlorpyrifos Use In Arizona
Prepared by Peter C. Ellsworth, Al Fournier, Wayne Dixon, Channah Rock
Comments submitted by the Arizona Pest Management Center
University of Arizona

EPA Docket: EPA-HQ-OPP-2015-0653

Key Points

- *Current EPA risk assessment models for chlorpyrifos do not address many of the realities of Arizona agriculture (e.g., realistic use patterns, minimal runoff due to laser leveling, solar degradation of compound, lack of water bodies in proximity to agriculture, and actual groundwater measurement data). Furthermore, current label restrictions limit the use of chlorpyrifos more than an order of magnitude below the level of use assumed in EPA models.*

One of the most recent reports we developed, for chlorpyrifos, was Submitted Jan 5, 2016 and made use of Pesticide Use Data.

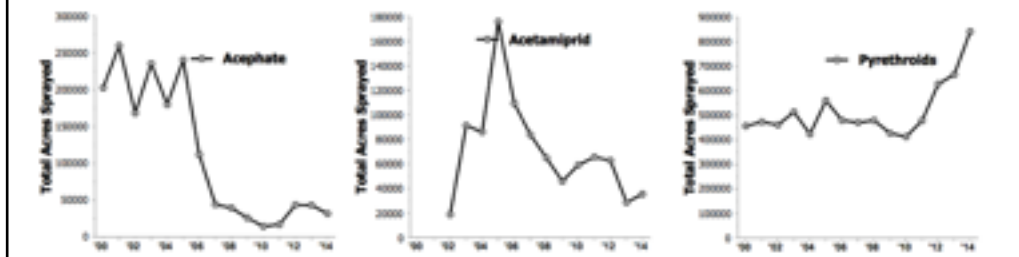


Our dicrotophos, response dated Nov 10, 2014, made use of the APMC Pesticide Use Database to characterize use patterns in Arizona.

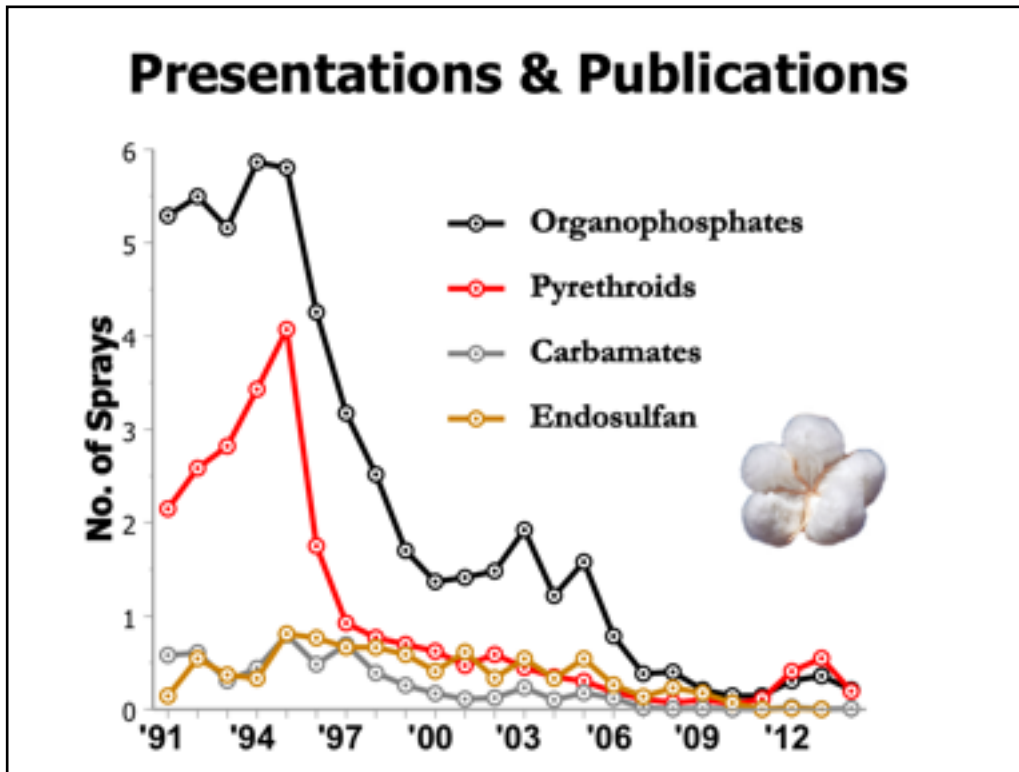
Pollinator Issues

Issues identified included:

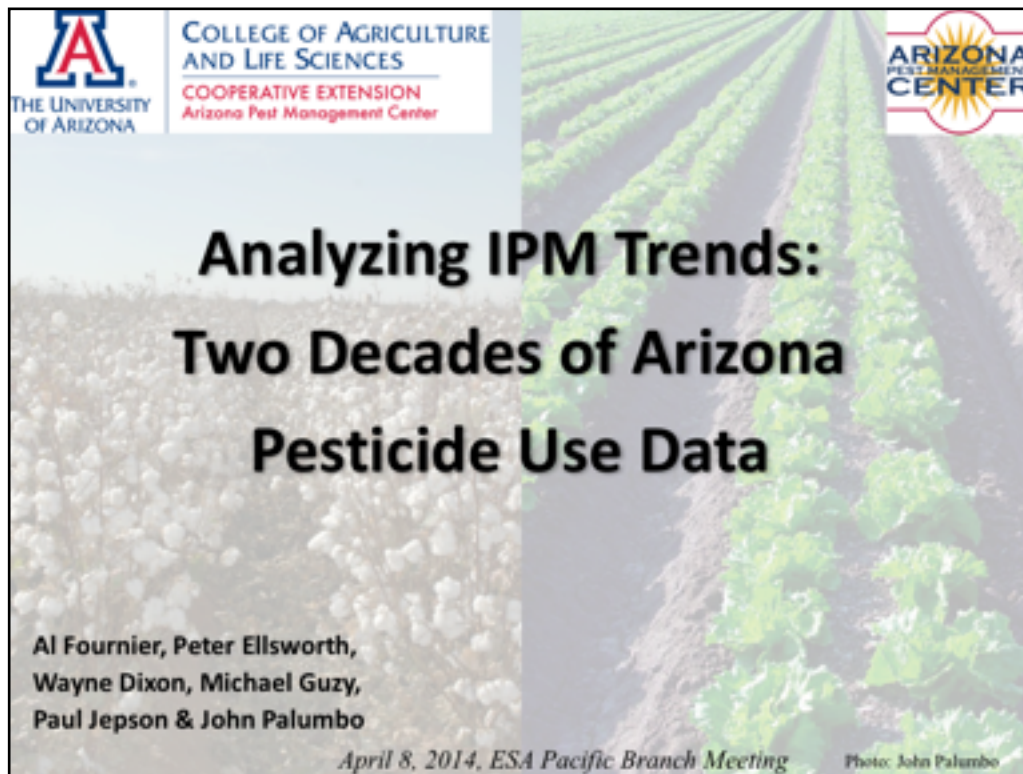
1. Concern about the loss of important pest control tools.
2. Economic harm to growers expected to result from the proposed label changes.
3. These products are now effectively and safely used in many crops without harming bee populations.
4. This proposal will not only affect growers who are contracting 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).



In 2015, we responded to an EPA open comment period on the topic of pollinator protection. The EPA proposal would eliminate the use of 76 active ingredients (insecticides and herbicides) in crops with managed (contracted) pollinators while crops are in bloom. We presented data on the use of several key chemistries in Arizona and collected stakeholder input on how the proposal would impact Arizona agriculture.



Charts like this one, based on Pesticide Use Data, have frequently been used in Extension presentations, publications, impact reports, and have been presented at academic conferences. Our national and international colleagues often marvel that we have access to this kind of data. As well, they are amazed at the progress made in Arizona agricultural pest management as depicted by these trends.



In collaboration with colleagues at Oregon State University, we analyzed over 20 years of Pesticide Use Data in Arizona lettuce and documented stunning reductions in environmental risks as a result of reduced-risk technologies and the outstanding stewardship practices of our produce industry.

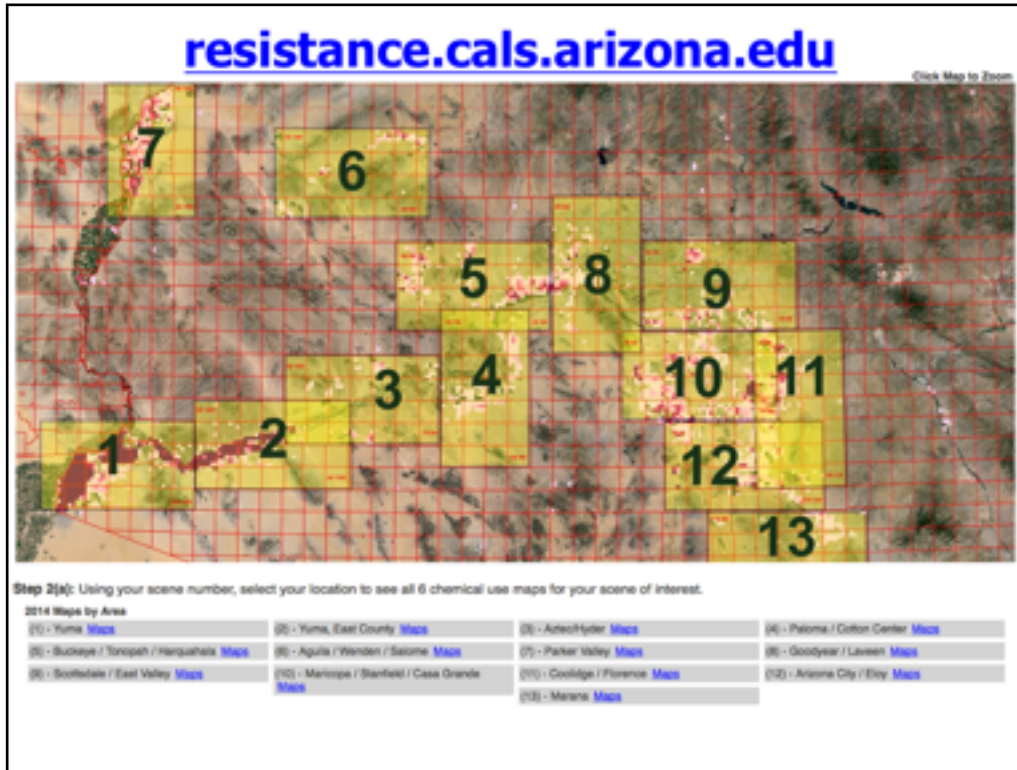


Chemical Use Maps for WF Resistance Management

- **Develop maps of key whitefly chemistries – last year’s use patterns based on 1080**
 - Outreach
 - Support PCA pesticide decisions
- **Research: examine relationship between chemical use and resistance in the field**
 - Sampling & testing for resistance in lab
- **Evaluate adoption and use of maps**
 - Surveys, surveys, surveys!

Funding: USDA ARDP, Monsanto IKRP, Cotton Inc.



Our most recent project, led by Dr. Peter Ellsworth, is development of Chemical Use Maps that show where 6 key modes of action for whitefly control were used in 2014. In July 2015, we made the maps available to PCAs to help inform whitefly management decisions, with an eye toward reducing over-reliance on any single chemistry within a geographic area.



We developed a set of 6 maps (one for each mode of action) for each of 13 geographic regions. The maps show all reported uses of these chemistries for 2014.



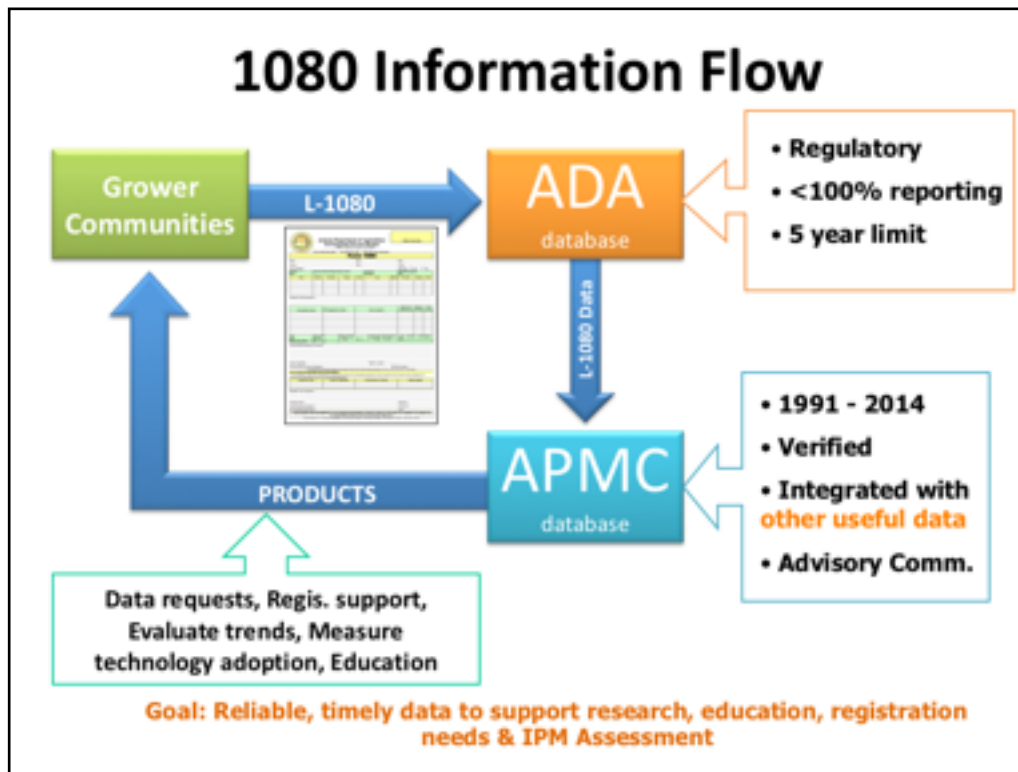
Here is one example map that shows neonicotinoid use in part of central Arizona (Pinal County). [Slide intentionally blurred to protect data.]



APMC Pesticide Use Database

- **Partners:**
 - Arizona Dept. of Agriculture
 - Stakeholder Advisory Committee
- **Funding:**
 - USDA Specialty Crops Block Grant
 - USDA-ARDP (Chemical Use Maps)
 - Monsanto-IKRP (Chemical Use Maps)
 - USDA Extension Implementation Program
 - Cotton Inc.
- **Goal:**
 - **Reliable, timely data to support research, education, registration needs & IPM Assessment**

All of these projects are possible only because of the partnerships we have formed with Arizona Department of Agriculture and with our stakeholders. Our Advisory Committee includes growers, PCAs, agrochemical industry reps, applicators and representatives from ADA and UA. Much of our work in developing the database has been funded through a series of USDA Specialty Crop Block Grants, Cotton Incorporated, and the USDA-NIFA Extension Implementation Program. The Chemical Use Maps specifically are funded through 2 grants, one from USDA-NIFA and another from Monsanto.



After grower communities submit the data to ADA, it gets entered into their local 5-year database, used for regulatory purposes. Data older than 5 years is not maintained by ADA. We have tapped into their data and expanded it with historical 1080 data back to 1991. We verify their data, correct errors and integrate other data sources, including tables from EPA. We use the data to produce products that bring information back to grower communities.




Lots of data!

- Almost 25 years of data (1991 - 2015)
- 612,000+ 1080s (~24,000/yr)
- 1,005,000+ sprayed locations
- 2,100+ products
- 120+ different crops

Errors do occur!




The stats on this slide give you an idea of the size of the pesticide use database. Errors do occur and we invest a lot of personnel time into identifying and correcting these errors.



Data Verification

- Screening data during import from ADA
- Queries to identify potential errors
 - High and low rates
 - High acres treated
 - Location errors
 - Missing products (new ones)
- Review of potential errors and resolution
- PDF forms of 1080s from ADA help
 - No PDFs for Agrian data submitted electronically


A database is only as good as the data it contains. Garbage in means garbage out. For this reason, we proactively review the data, seek out potential errors and correct them. We have access to PDF scans for a high percentage of the submitted 1080 forms, which greatly improves our ability to correct data.



Data Issues (1)

- **Data entry errors (ADA)**
 - Error rate is small, but can add up
 - Many fields can be affected
- **Rates**
 - Decimal errors
 - Math errors
 - Acres incorrect
 - Typos
- **Product errors**
 - Product identification (based on EPA#)
- **Crop identification errors**

These are some of the types of data errors that can be seen in a small proportion of the data. With over 100 different data fields on over 1 million 1080 forms in our database, even a low error rate can result in a large number of records that need to be manually reviewed and corrected. This requires a large investment of personnel time.




Data Issues (2)

You can help!

- **Duplicated records!**
 - Faxed twice
 - faxed and mailed
 - Agrian electronic submission, also mailed or faxed
 - Sprays over multiple days, resubmitted

Outreach to Custom Applicators...and others?

One disturbing error we see is when a single 1080 form is submitted more than once to ADA. Sometimes the form may be entered multiple times, leading to an overestimate of chemical use. We have worked with ADA to help reduce the potential for entering the same data twice. However, you can help by making sure any applications get submitted to ADA via only a single route. For example, if data are sent electronically through Agrian, do not submit a hard copy to the state.



Data Issues (3)

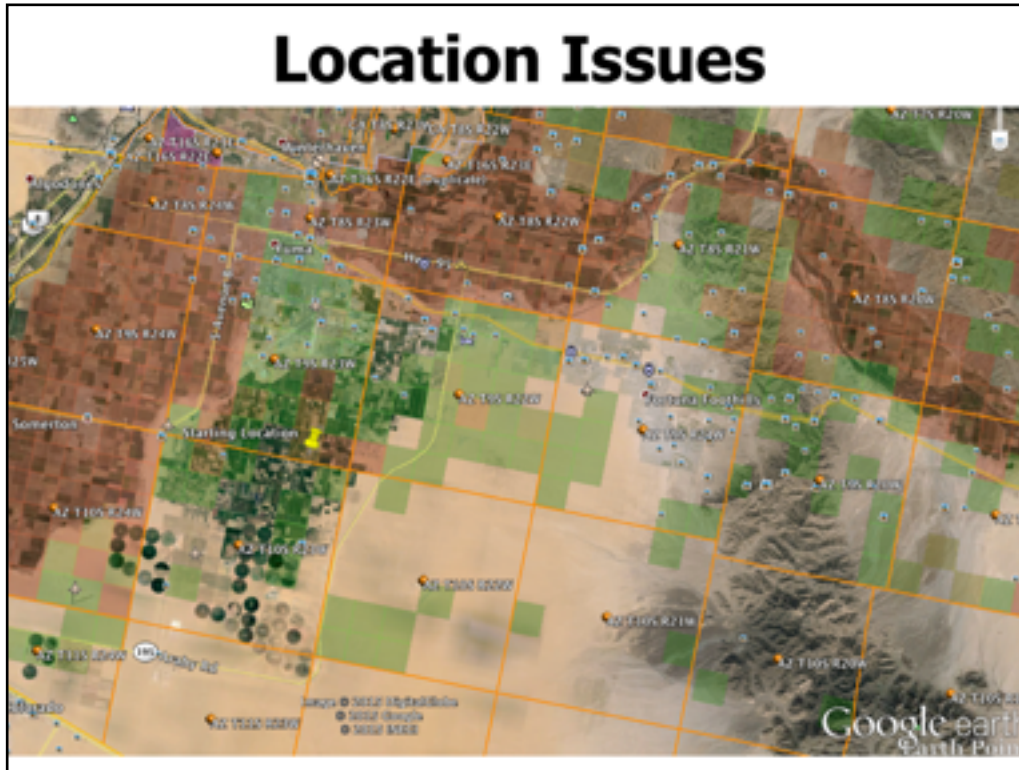
You can help!

- **Location errors**
 - **Data entry at ADA (not common)**
 - **Wrong TRS on 1080, often repeated**
 - **Additional field notes and site information important to resolving these issues**

We can help!

- *We are developing web resources including TRS maps and links to useful apps.*
- *I will visit one-on-one with office staff or others, or present at company meetings*

In developing the Chemical Use Maps in 2015, we realized we have a significant number of location errors in the database, where Township, Range, and / or Section are incorrect. We created a template that indicates where all agricultural land sits (by section) throughout the state. We use this to check for reported uses in non-agricultural areas. We found that sometimes when a TRS is entered incorrectly for a field, the same error gets repeated with each subsequent 1080 that is turned in. There are online tools that include a Township-Range-Section grid to help growers and PCAs identify and correct these errors. (See below.)



This map shows what our data looked like at the beginning of the mapping project, before data corrections. Pesticide applications (brown and green squares) are sometimes shown outside of valid agricultural areas. Each of these records had to be examined and in many cases we made calls to PCAs or growers to make them aware of these errors and to help us find the valid location.

You may hear from me...



You may hear from me if you are a PCA or grower and we find a record with invalid location information. I can use your help to make sure we get the information right in our database.

Resources

- **Earth Point – Integrates with Google Earth, provides TRS grid**
 - www.earthpoint.us
 - \$50/yr per user with discounts for multiuser accts
 - \$10 pre-pay option
- **Public Land Survey System (PLSS)**
 - www.metzgerwillard.us/plss/plss.html
- **UA developing a portal plus AZ-specific map resources**
 - Coming soon!

These two websites are available, and can help you if you are not sure about the legal description for a field location. You can download a simple App that works with Google Earth on your computer or tablet. It places the Township-Range-Section grid over the map to help you identify where you are. Both of these links can be found on a UA webpage with other resources, including maps, to help improve 1080 data.



Thank you!

Photo credit: J. Silvertooth