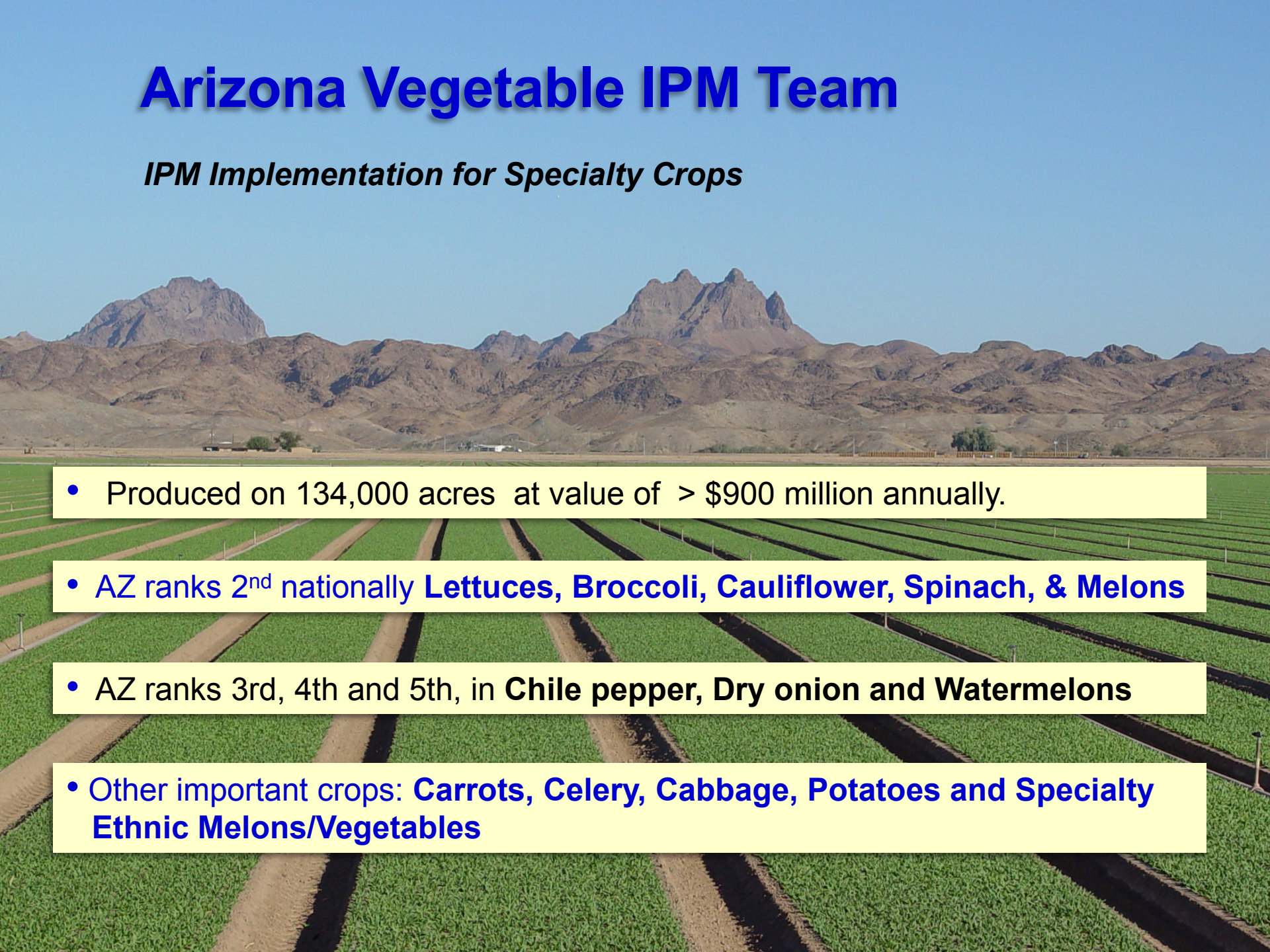
Arizona Vegetable IPM Team

IPM Implementation for Specialty Crops



- Produced on 134,000 acres at value of > $900 million annually.
- AZ ranks 2nd nationally **Lettuces, Broccoli, Cauliflower, Spinach, & Melons**
- AZ ranks 3rd, 4th and 5th, in **Chile pepper, Dry onion and Watermelons**
- Other important crops: **Carrots, Celery, Cabbage, Potatoes and Specialty Ethnic Melons/Vegetables**

Team Justification

- Diversity and intensity = demands for IPM

- Maintenance of existing IPM programs essential for vegetable production.

"All IPM is local"

- IPM programs in AZ are research-based.

- Resources for IPM education are scarce.

Goal of the Vegetable IPM Team:

1) Science-based, multidisciplinary outreach program.
2) Delivery of relevant information and IPM technologies for desert vegetables.
3) Reduces reliance on broadly-toxic pesticides without sacrificing yield, quality and profitability, while minimizing dietary and environmental risks.

Vegetable IPM Team Approach

To synergize the UA's outreach efforts in Vegetable IPM by strategically investing in an extension educator to assist Vegetable team members in delivering relevant IPM information in a timely and practical manner.

The extension educator, Mr. Marco Pena, was hired in late November 2009 at a 1.0 FTE (0.5 FTE funded by ADA SCRBG grant).

Vegetable IPM "Core" Team Members:

- John Palumbo — *Entomology Specialist*
- Mike Matheron — *Plant Pathology Specialist*
- Barry Tickes — *Area Weed Specialist*
- Kurt Nolte — *Area Vegetable Specialist*

*** **Collectively > 80 yrs experience in IPM**

Expected Impact and Measurable Outcomes

1. ***Our primary expected outcome is to increase awareness and technical knowledge of IPM among target audiences*.**

    * Increased delivery to stakeholders

2. ***Another expected outcome is the increase use of IPM tactics.***

    * Measure changes in IPM-related behavior

Activities, Outputs and Their Use

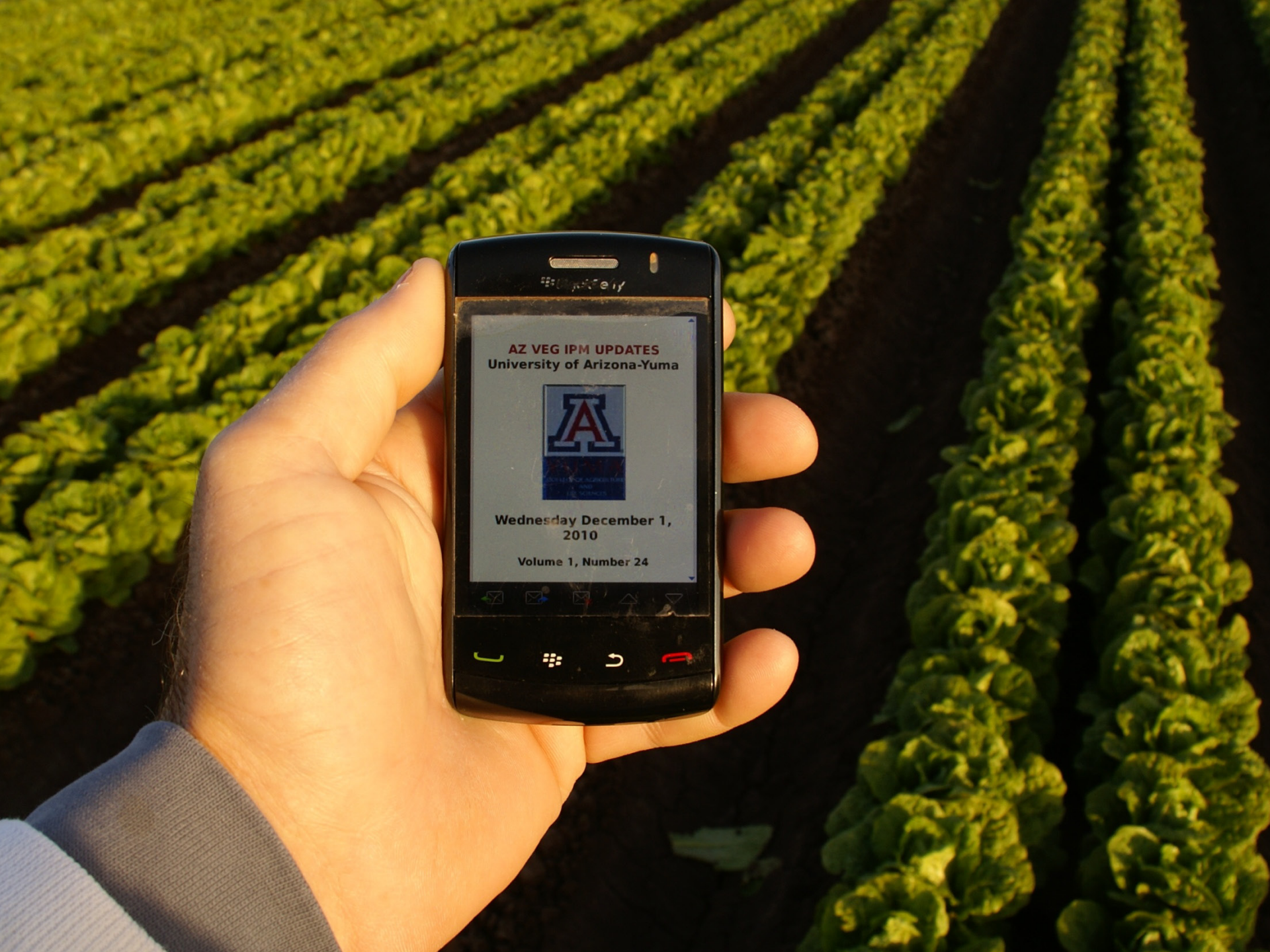
1. Stakeholder Engagement & Needs Assessment

2. Translational Science & On-Farm Demonstration

3. Educational Meetings, Updates & Events

4. Dissemination of Technical Resources

5. Troubleshooting and Field-Site Visits


AZ VEG IPM UPDATES
University of Arizona-Yuma
Wednesday December 1, 2010
Volume 1, Number 24

Vegetable IPM Updates for April 6, 2011 - Message (HTML)

Message | Adobe PDF

Reply | Reply to All | Forward | Delete | Move to Folder | Create Rule | Other Actions | Block Sender | Safe Lists | Not Junk | Categorize | Follow Up | Mark as Unread | Find | Related | Select | Send to OneNote

From: Veg IPM TEAM [marcop@cals.arizona.edu]
To: Veg IPM TEAM
Cc:
Subject: Vegetable IPM Updates for April 6, 2011
Sent: Tue 4/5/2011 4:31 PM

AZ VEG IPM UPDATES

University of Arizona-Yuma

Wednesday April 6, 2011

- To subscribe email Marco Pena or call (928) 782-6871, at the University of Arizona, Yuma Agricultural Center.

Published every two weeks, this advisory provides current vegetable IPM updates, production information and future workshop and meeting reminders for those involved in the desert vegetable industries.

- **Insecticide Modes of Action on Desert Vegetables**

John Palumbo, Research Scientist and Extension Specialist

With the produce season winding down, now is a good time to review the insecticide chemistries that are commonly used on desert crops to control insect pests. This is important because to sustain the insecticide efficacy that annually provides growers with cost-effective crop protection requires a conscious effort to prevent insecticide resistance. Over the past 20 years, the Agrochemical Industry has developed and brought to the market an unprecedented number of new chemistries. However, the development of new chemistries appears to be decreasing considerably, and older chemistries are continually being phased out of the marketplace (don't forget, endosulfan will be gone in 2013). Thus, it is imperative to sustain the efficacy of the newer IPM tools currently available, and makes insecticide resistance management (IRM) more important than ever. The most fundamental approach to IRM is to minimize the selection of resistance to any one type of insecticide. Historically, alternating or rotating compounds with different modes of action has provided sustainable and effective IRM in our desert cropping systems. The Insecticide Resistance Action Committee (IRAC), a coordinated crop protection industry group, was formed to develop guidelines to delay or prevent resistance. Using their most recent MOA grouping brochure, we have produced a table which provides the modes of action for the insecticide chemistries commonly used on desert crops (see: Insecticide Modes of Action on Desert Vegetables). We also provide general information on the routes of activity and pest spectrums for each chemistry. These classification lists will provide you with an additional set of guidelines to the selection of insecticides that can be used in desert IPM programs.

Start

Desert Magazine – 1939
AZ Historical Review 1929

ARIZONA INSECTICIDES

Alyssum on VAC
Label with BP

Veg IPM updates
– IRM
– Lit. data
– Weather
– Thrips data re Resistance
– Veg Edu Prod. – BMP vol 2

Mixtures
Seed TMT
Spin/Thon

jpalumbo

From: Veg IPM TEAM [marcop@cals.arizona.edu]
Sent: Wednesday, October 06, 2010 8:42 AM
To: Veg IPM TEAM
Subject: Veg IPM Updates for October 6, 2010
Attachments: image001.jpg

AZ VEG IPM UPDATES

University of Arizona-Yuma

Wednesday April 6, 2011

- ### Bagrada Bug Update

[John Palumbo](), **Research Scientist and Extension Specialist**

Bagrada bug pressure on desert cole crops appears to finally be letting up. Based on our trials here at YAC and reports from numerous PCAs in Coachella, Imperial, Blythe and Yuma, the adult numbers on new stands have been much lower in the past week. On older stands, the plants now appear to be growing "normally" and insecticide applications are providing longer residual (go to this link for early results of an efficacy trial). In other research trials, it appears that soil applied neonicotinoids are proving some relief against adults as well. Broccoli plants and cauliflower transplants that were treated with soil applications of imidacloprid (Admire, Alias, Nuprid, etc) or clothianidin (Belay) at planting are significantly larger than untreated plants at 30 days after wet date. Although treated plants (at cotyledon or transplant stages) took some damage at stand establishment, it seems that once the plants produced fully expanded leaves the soil insecticides began to provide protection from Bagrada bugs. However, the ultimate impact of the Bagrada bug infestations may not be evident until harvest when we can assess maturity and quality of the crops that were heavily attacked early in stand establishment. Although bug numbers have declined, PCAs should still remain vigilant and scout fields thoroughly for the presence of adults, and signs of new feeding damage (tattoo like feeding scars) on cotyledons and young terminal leaves. Research here at YAC on Bagrada adult

activity has suggested that adults appear to be most active and abundant on plants in fields during the warmer parts of the day (9:00 AM to 4:00 PM), and least abundant on the plants early in the morning (4:00 AM to 8:00 AM) (see this link for preliminary findings). Thus, the highest probability of finding Bagrada bug adults on plants would be during mid-day. This may also be the best time to apply insecticides as well.

Melon Powdery Mildew

[Mike Matheron](), **Extension Plant Pathologist**

Melon growers need to keep in mind that powdery mildew can occur on fall melons in the desert. If you have dealt with powdery mildew on spring melons, you will recall that powdery mildew starts off as very small colonies that may be few in number; however, they will continue to grow and produce ever larger quantities of spores, which in turn initiate more infections to bring about a rapid increase in disease symptoms. In recent fungicide evaluation trials, several fungicides have provided excellent control of powdery mildew, including Microthiol Disperss (wettable sulfur) Quintec (quinoxyfen), Procure (triflumizole), Rally (myclobutanil), and Endura (boscalid). Thoroughly read the label for each product before use for critical information concerning that particular chemistry. Effectively managing powdery mildew with fungicides is best achieved by initial application ideally before the first visible presence of the disease. Subsequent applications of fungicides throughout the life of the crop may be necessary. The fungus responsible for powdery mildew on melons has developed resistance to some fungicides in the past, so maintaining long-term effectiveness of fungicides currently available requires the use of resistance management strategies. One effective approach is to alternate among products with different modes of action. The risk of powdery mildew on a particular melon planting will be affected by the genetic susceptibility of the melon cultivar to the disease as well as air temperatures during the growing season.

Postemergence Grass Herbicides

[Barry Tickes](), **Area Agriculture Agent**

Postemergence grass herbicides have been available for the past 20 to 25 years. These include fluazifop(Fusilade-1985), sethoxydim(Poast-1986, Segment, Vantage and others), and clethodim(Select-1991, Select Max, Arrow, Envoy, Volunteer, and others). They only control grasses and are registered on numerous broadleaf vegetable and field crops as well as trees and vines. These herbicides are all classified as lipid biosynthesis inhibitors. They work by inhibiting the production of an enzyme (ACCase) used to produce fatty acids which are needed in the formation of cell walls and other plant membranes. They are slow acting and have no soil activity. There are some herbicides that use this same mode of action but are used safely on wheat and barley. These include Discover(clodinafop), Puma(fenoxaprop), and Achieve(tralkoxydim) which are commonly used to control Canarygrass, wild oat and other grasses. These herbicides are all fairly broad spectrum and control most grasses although there are differences between them on some weed species. Clethodim will control sprangletop while sethoxydim and fluazifop will not. The same is true for annual bluegrass which is controlled only by clethodim when it is small. All of these are weak on sandbur. These herbicides have no soil activity and typically need to be applied 2 or 3 times to achieve season long weed control. They all require the use of a crop oil concentrate to help penetrate the leaf surface except for Select Max which requires either a non-ionic surfactant or crop oil. These herbicides are normally very safe to the crops that they are registered on. There have been only a few instances over the past 25 years where crop injury has occurred. One was to melons where above labeled rates of Select Max was applied in overlaps or at the ends of fields. This was only from Select Max. Another instance was several years ago on onions where liquid fertilizer (AN20) was previously sprayed over the onions for weed control. The third instance was to some leafy vegetables, especially arugula, where the crop oil concentrate caused leaf burn. Although these herbicides once seemed fool proof, each year more failures are being reported. Last year, for instance, Poast and Select did not control Rabbitfootgrass in a couple fields and Canarygrass was missed by Poast in others. The only documented case of herbicide resistance in this region has been the resistance of Canarygrass to sethoxydim, fluazifop and clethodim in the Imperial Valley. There are several potential causes for herbicide failures and resistance is only one of them and is rare in this region. Please let us know if you have failures so that we can help determine the cause. A video on this subject can be found on this link.

To see updates from previous weeks visit the Arizona Crop Information Site

Veg IPM Updates, 2010-11

http://ag.arizona.edu/crop/vegetables/advisories/archive.html

Insects

Aphids	3
Thrips	3
Worms	2
Bagrada bugs	5
Regulatory Issues	4
Whiteflies/ CYSDV	3
Leafminers	1
Miscellaenous pests	4
IPM practices	6

Diseases

Lettuce-mildews	5
Lettuce - fusarium wilt	4
Fungicide resistance	2
Lettuce drop	5
Lettuce virus	2
Melon powdery mildew	5
Pepper diseases	1
IPM practices	7

Weeds

Cole crop herbicides	2
Lettuce herbicides	7
Melon herbicides	2
Weed ID	3
Herbicide Resistance	2
Herbicide Injury	2
Regulatory Issues	4
Weed IPM	9

- **32** VegIPM Updates have been delivered to date.
- January 2010, listserve contained 172 email addresses.
- December 2010, the listserve contained 311 addresses.
- In addition:
  - La Paz Co. CES distributes to ~ 50 additional
  - Riverside Co., UCCE distributes to CA PCAs
  - Western Farm Press
  - Western Agri-Radio Network

Lettuce Weed Control/ Low Deserts

Barry Tickes
University of Arizona
Revised 6-08

				Grasses		Mustards			Goosefoot		Sunflower			Nightshade		Other			
Herbicide	**CA/AZ**	**Year first registered or expected**	**Available as a generic**	**Summer Annual**	**Winter annual**	**London Rocket**	**Shepardspurse**	**Wild mustard**	**Lambsquarters**	**Nettleleaf Goosefoot**	**Sowthistle**	**Sunflower**	**Prickly Lettuce**	**Groundcherry**	**Silverleaf Nightshade**	**Purselane**	**Malva**	**Pigweed**	**Comments**
Balan	CA/AZ	1965	Y	●	●	○	○	○	●	●	○	○	○	○	◗	●	○	●	Must be mechanically incorporated. Do not concentrate on bed top or injury can occur.
Prefar	CA/AZ	1968	N	●	●	○	○	○	◗	●	○	○	○	○	○	●	○	●	Incorporate with high volume of sprinkler irrigation to push down to where weed seeds are germinating.
Kerb	CA/AZ	1969	N	●	●	●	●	●	●	●	○	○	○	◗	◗	●	◗	◗	Will leach below weed seeds if applied too early or with too much sprinkler water. Delayed application often necessary.
Poast	CA/AZ	1984	Y	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	Will not control annual bluegrass or Sprangletop. Always use COC.
Select	CA/AZ	1987	Y	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	Use highest rates to control annual bluegrass and Sprangletop. Can use either NIS or COC with Select Max but only COC with Select

● Good Control ◗ Partial Control ○ No Control

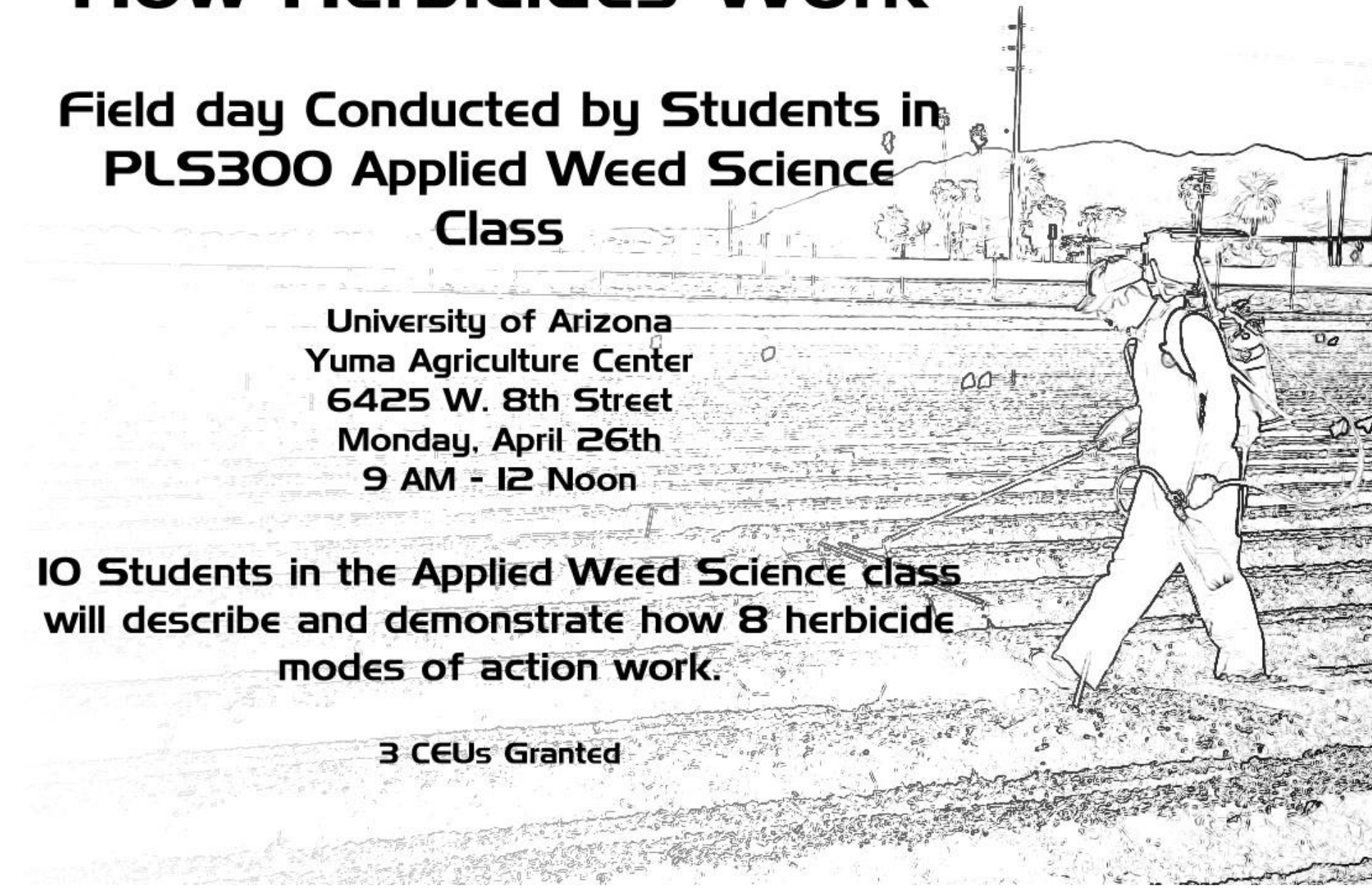
How Herbicides Work

Field day Conducted by Students in PLS300 Applied Weed Science Class

University of Arizona
Yuma Agriculture Center
6425 W. 8th Street
Monday, April 26th
9 AM - 12 Noon

10 Students in the Applied Weed Science class will describe and demonstrate how 8 herbicide modes of action work.

3 CEUs Granted



THE UNIVERSITY OF ARIZONA

Vegetable IPM Video Archive

COOPERATIVE EXTENSION

This page contains a collection of educational videos from current research work in vegetable crops by University of Arizona Researchers. The purpose is to inform interested parties of new trends, recommendatio and developments in the field. Another goal is to demonstrate the U of A Experiment Station's involvement a contributions to Vegetable Integrated Pest Management. We hope that the information provided here is helpfu for those involved in the industry.

Insect Management Videos:

Systemic Insecticide Evaluation

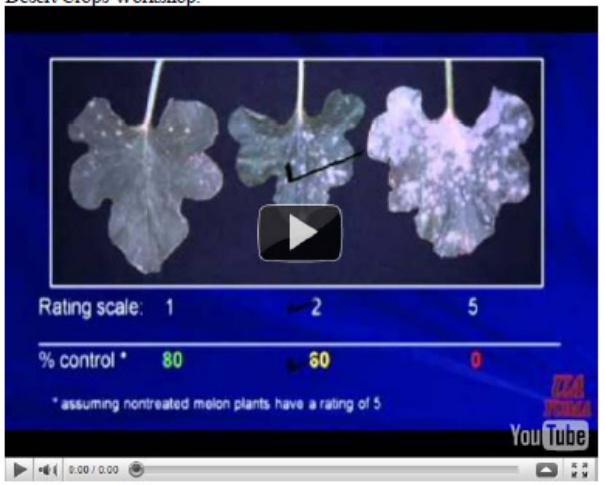
Describes how a systemic insecticides experiment was conducted by Dr. John Palumbo and his technicians at the U of A Yuma Agriculture Center.

How Herbicides Work: Part I

Students from the Applied Weed Science PLS 300 class participated in the Field Day: "How Herbicides Work", Barry Tickes explained one Mode of Action (MOA).

Effective Management of Melon Powdery Mildew in the Desert Part II

University of Arizona Plant Pathologist Mike Matheron's presentation on the 21st. Annual Fall Desert Crops Workshop.



http: //ag.arizona.edu/crop/vegetables/videos.html.

IPM Technical Outreach and Delivery

Grower Field Days / Demos

- Herbicide Mode of Action
- Herbicide Injury
- New Herbicide Registrations

On-farm Research Projects

- *Herbicide Residual on broccoli*
- *CYSDV Incidence on melons*
- *Diamide Uptake in lettuce*

Industry /PCA Educational Meetings

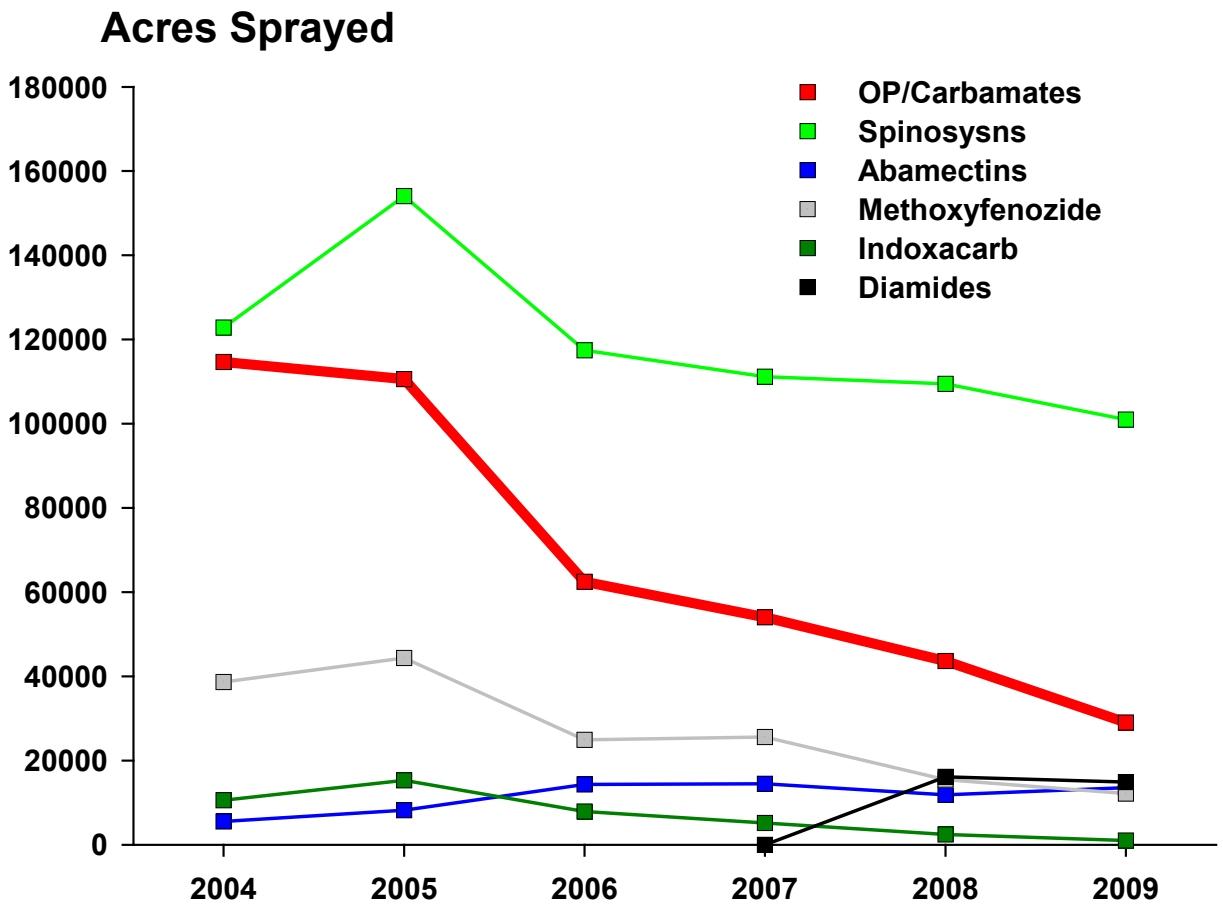
- *Southwest Ag Summit*
- *Desert Ag Conference*
- *Preseason Vegetable Meeting*
- *Fall Desert Crops Workshop*

Pest Crop Loss Workshops

- *Lettuce Workshop - YAC*
- *Melon Workshop - YAC*
- *Melon Workshop – MAC*

Lettuce Insect, Disease and Weed Losses Workshops

Changes in Insecticide Usage (2004-2009)

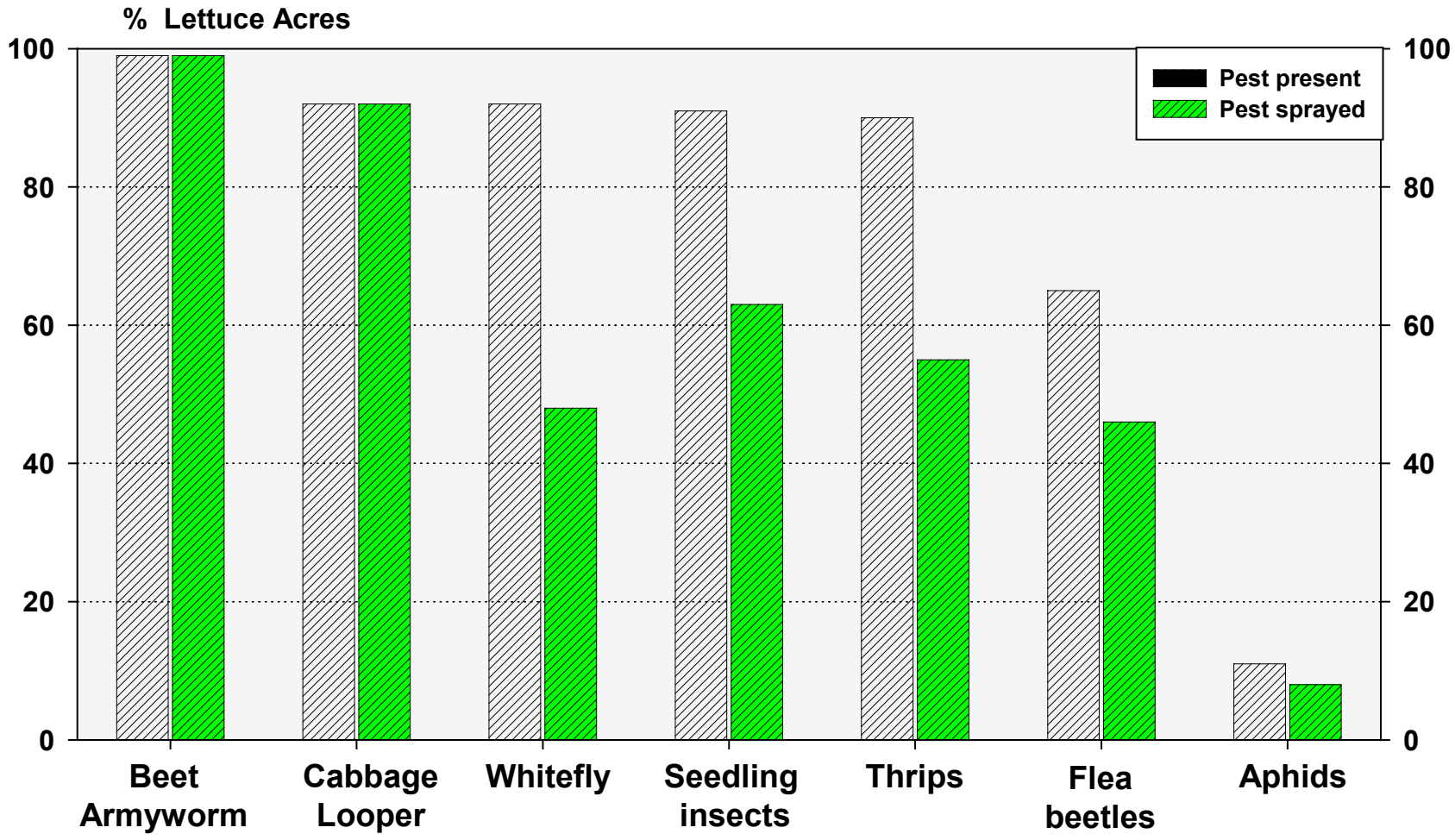


Leafy Vegetables are intensively scouted !

	Scouted acres (%)	Field visits/wk	Scouting costs ($/ac)
2004	100	3.1	$20.89
2005	100	3.6	$21.90
2006	100	3.5	$22.36
2007	100	3.4	$22.50
2008	100	3.6	$22.10
2009	100	3.6	$24.00

Source: UA LIL Workshops, 2004-2009

Fall Lettuce – Key Pest Status, 2004-2009



Source: UA LIL Workshops, 2004-2009

Do the Stakeholders Benefit ?


ARIZONA
VEGETABLES