

# WHY USE BIOPESTICIDES IN AN IPM PROGRAM?

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# BARRIERS TO BIOPESTICIDE DEVELOPMENT / ADOPTION

- Snake oil image.
- Small companies. Recognition, Prestige \$
- Don't necessarily stand out in university trials.
- Why risk an unknown?
- Lack distribution network –Handle small volumes

# DO BIOPESTICIDES WORK OR ARE THEY JUST SNAKE OILS?



# Products do fail.....

## Excerpts from biopesticide reports

- Phytophthora following \_\_\_\_\_ and \_\_\_\_\_ treatment were not different than the untreated control.
- Botrytis infection was similar to the control when treated with \_\_\_\_\_ or \_\_\_\_\_.
- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ did not control blueberry midge

Can you guess the product names-Fill in the blanks?

# Products Do Fail.....

- Phytophthora following **Subdue** and **Truban** treatment were not different than the untreated control.
- Botrytis infection was similar to the control when treated with **Daconil** or **Insignia**.
- **Malathion**, **Thiamethoxam**, **Spinosad** did not control blueberry midge.

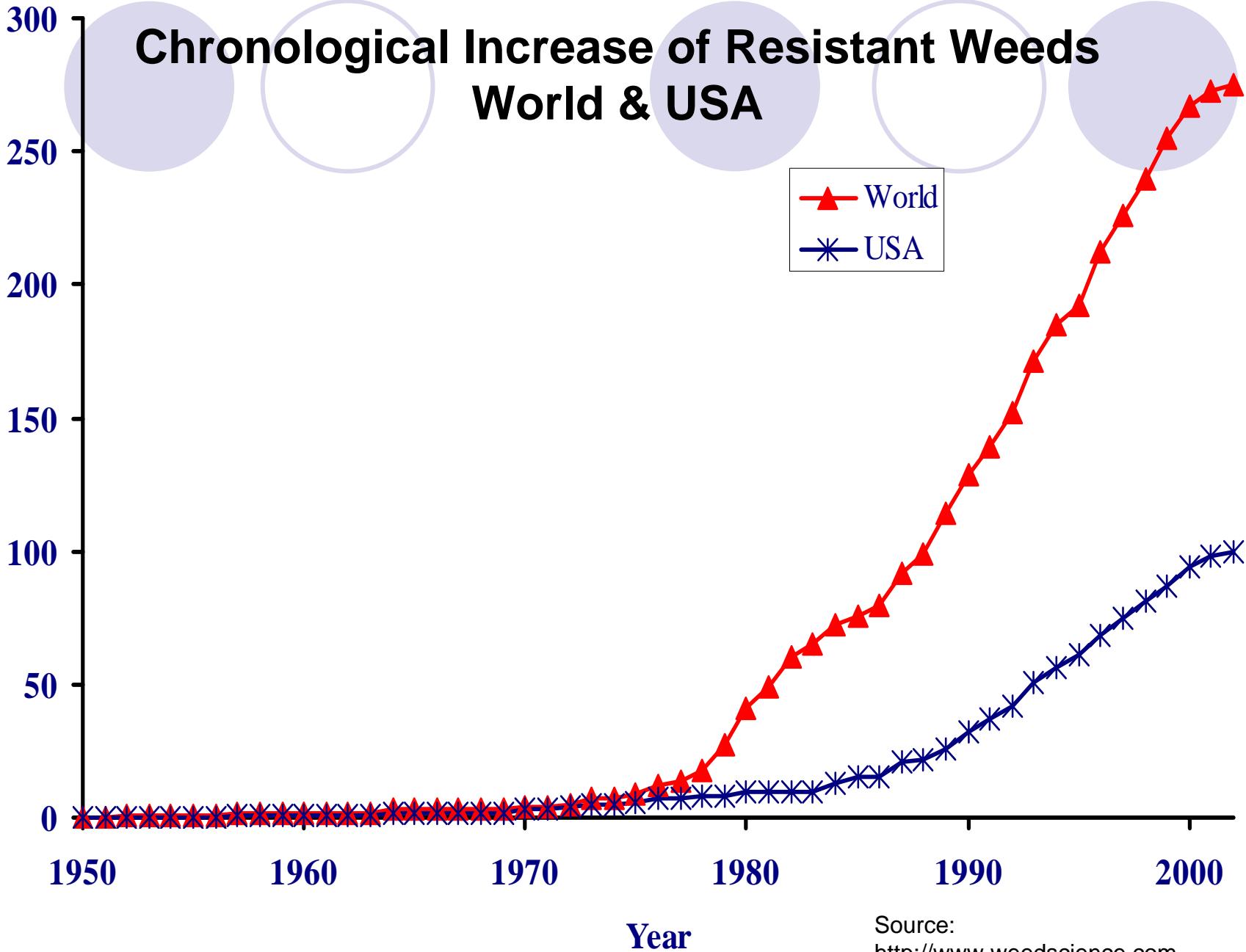
The point is that all products have variable performance.

# Top Pesticide Resistant Arthropods

Rank	Common name	# of pesticides	chem. groups	first report
1	Two-spotted spider mite	70	7	1943
2	Diamond-back moth	68	8	1953
3	Peach/Potato aphid	67	4	1955
4	Colorado potato beetle	40	8	1955

# Chronological Increase of Resistant Weeds World & USA

Number of Resistant Biotypes



Source:  
<http://www.weedscience.com>

# Documented cases of disease resistance to turf fungicides

Dollar spot	Rubigan, Bayleton, Banner, Chipco 26019, Vorlan
Pythium	Subdue and related products
Pink snow mold	Dicarboximides (Chipco 26019, Vorlan)
Anthracnose	Heritage, Compass, thiophanate-methyl (Cleary's 3336, Fungo)
Gray leaf spot	Heritage, Compass

# AF36- Atoxigenic *Aspergillus flavus* reduce aflatoxin in cottonseed



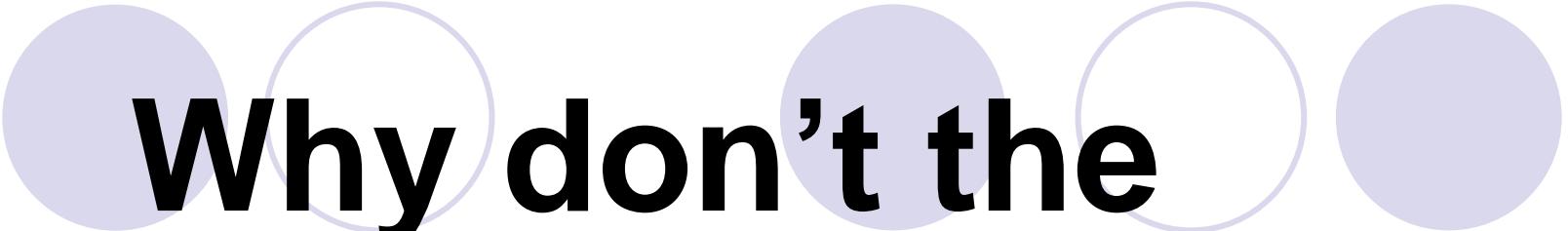
# Growers Aren't Interested in Biopesticides



# Arizona Cotton Research and Protection Council- Registrant , Manufacturer and Distributor of AF36

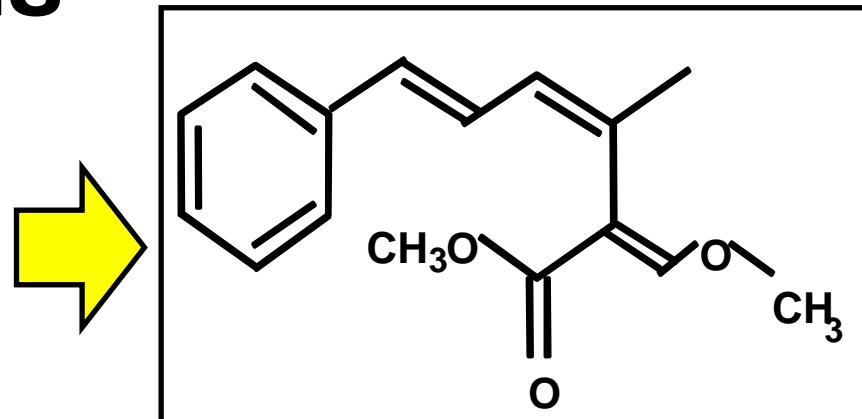
MANUFACTURED  
BY GROWERS -  
FOR GROWERS





**Why don't the  
major  
companies  
work with  
Natural  
products?**

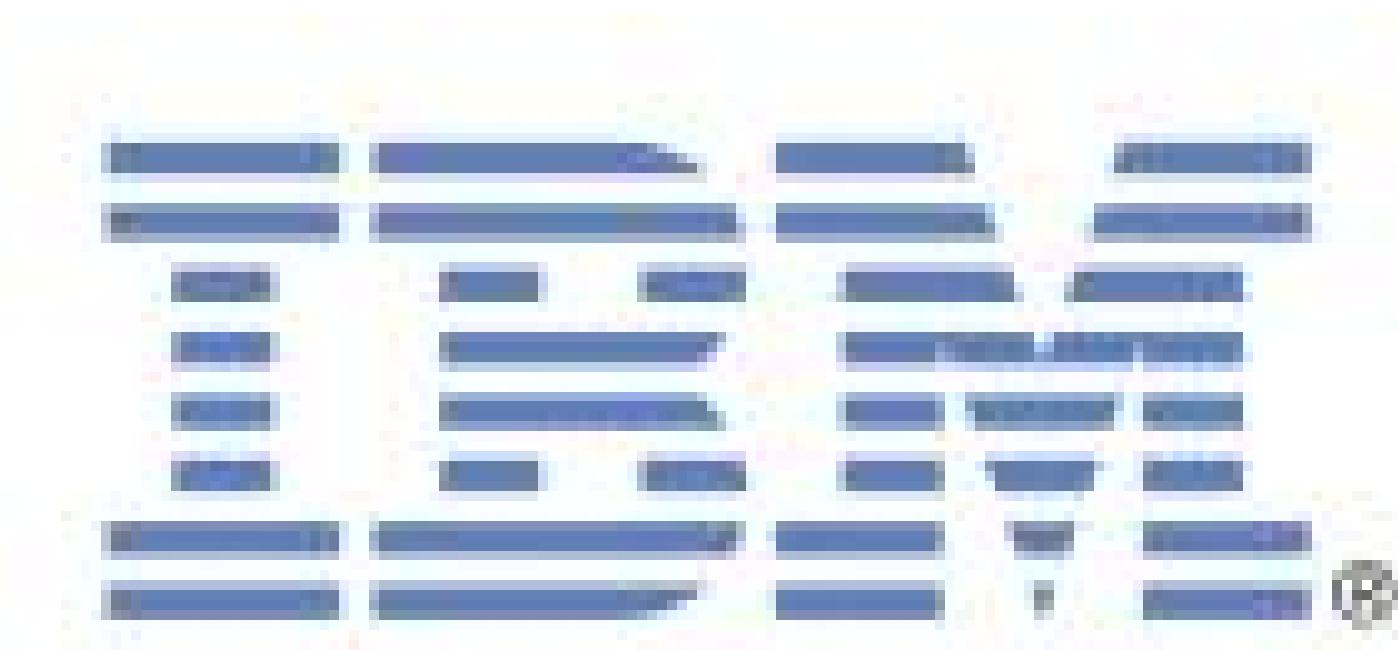
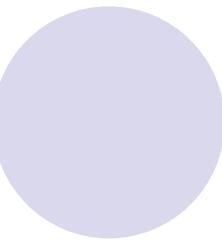
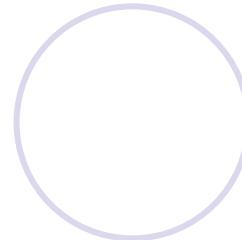
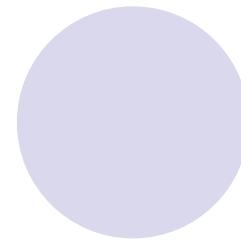
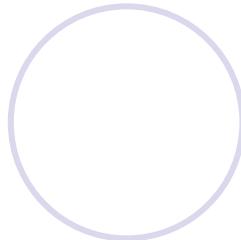
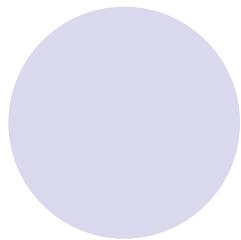
# Major companies work with natural products- Natural leads

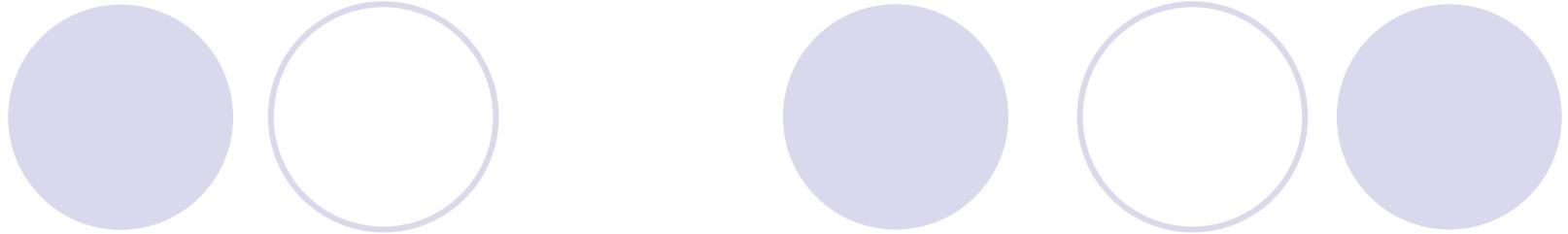


**Strobilurin A**

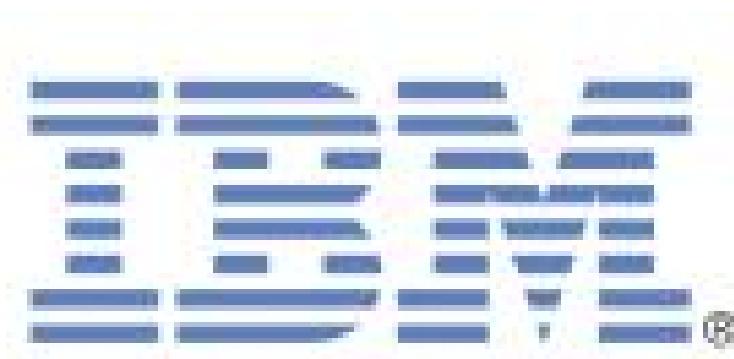
***Strobilurus tenacellus***

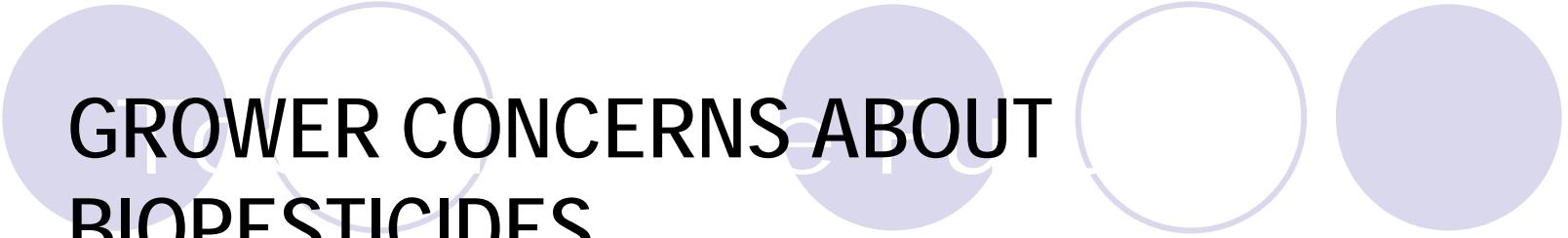
Wow. All of the newer strobilurin fungicides are  
based on a mushroom!





# **INTEGRATED BIOPESTICIDE MANAGEMENT**





## GROWER CONCERNS ABOUT BIOPESTICIDES

DOES IT WORK?

HOW MUCH DOES IT COST?

DOES IT WORK?

*Maybe the real question is.....* **DO WE  
KNOW HOW TO MAKE THEM WORK?**

# DO WE KNOW HOW TO MAKE BIOPESTICIDES WORK?

**FACT:** Biopesticides work best in rotational programs.

If you test them as head to head comparisons versus conventional products, most may not perform as well as conventional products. This is misinterpreted as they are not useful.

**REPEAT:** Biopesticides work well in rotational programs.  
So **rotate-rotate-rotate**.

**ACTION:** If you run field trials try biopesticides in rotational programs.

**It's not Conventional versus Biopesticide.**

**It's Biopesticides and Conventional**

How should I interpret results? *The glass is half empty. Hypothetical data*

- Conventional alone - 83% a
- Conv-Biopest rotation - 79% a
- Control - 0% b

There was no advantage to rotating the conventional treatment with a biopesticide

# How should I interpret results? *The glass is half full*

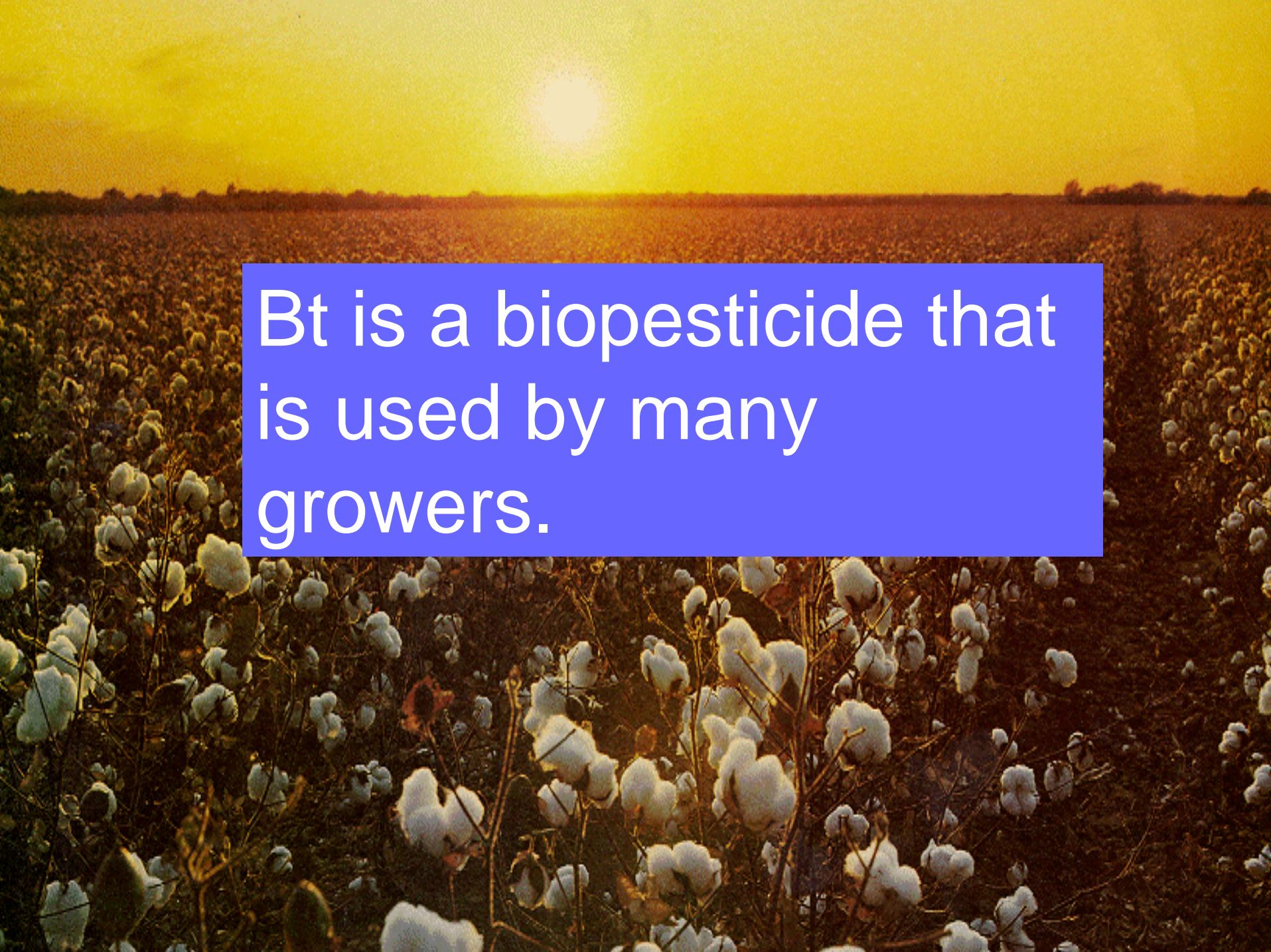
- Conventional alone - 83% a
- Conv-Biopest rotation - 79% a
- Control - 0% b

The level of control was maintained while gaining the following:

- **Resistance management**—Conventional weak-resistance prone
- **Re-entry period**- Flexibility labor intensive operations
- **Reduced time to harvest**- Multiple harvest
- **Residue management**- Don't produce illegitimate fruit!

Rotations/integrations are delivery mechanisms for biopesticides in that they enable their utility-Are delivery mechanisms important to biopesticide adoption?

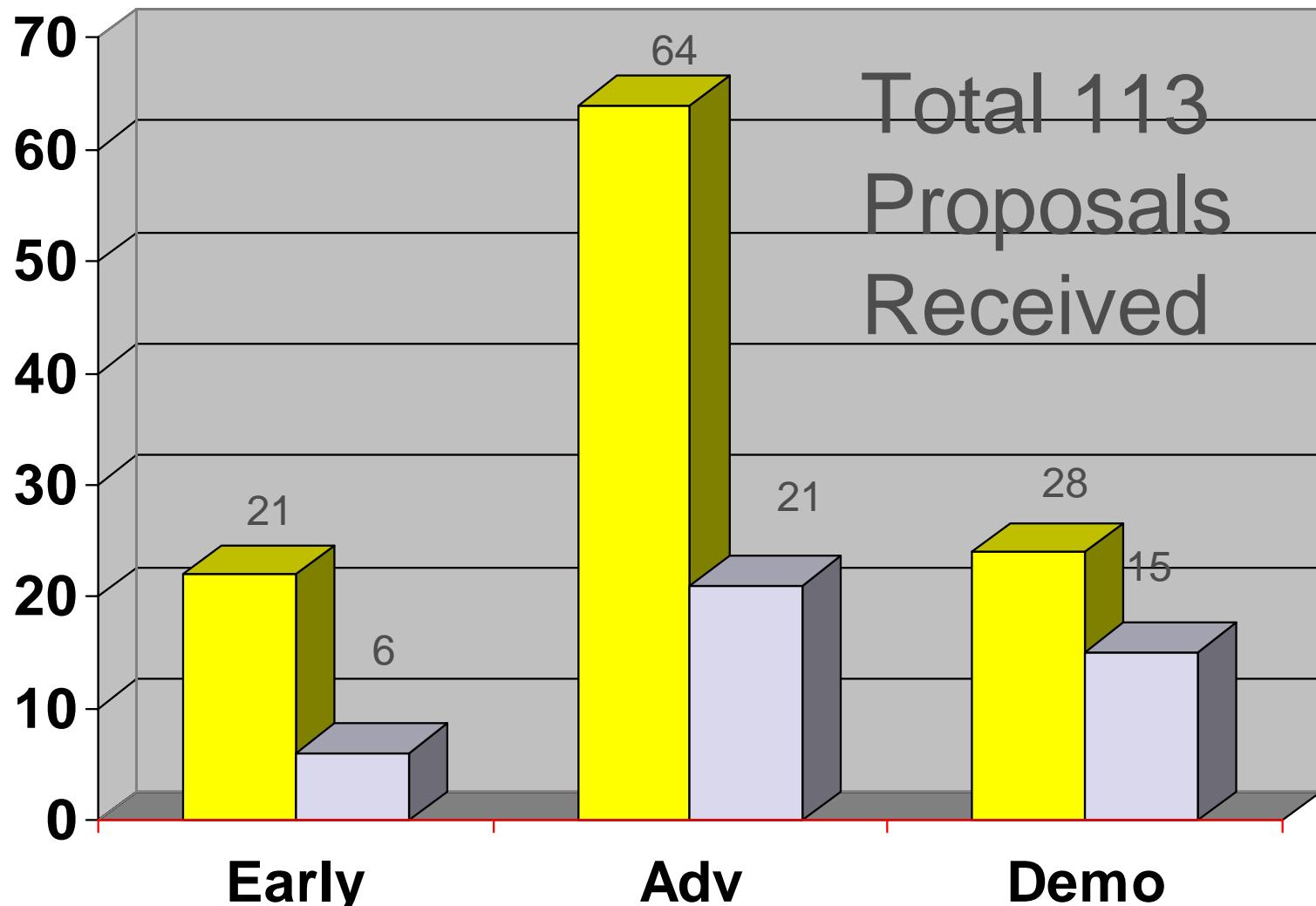
Can delivery mechanisms revolutionize grower adoption?

A photograph of a cotton field at sunset. The sky is a vibrant yellow, and the field is filled with cotton plants bearing white, fluffy bolls. A large, semi-transparent blue rectangular box is overlaid on the image, containing the text.

Bt is a biopesticide that  
is used by many  
growers.

# Proposal Statistics

■ Received ■ Funded





**Providing Safe and Effective Pest Management Solutions for Specialty Crop Growers**



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## Biopesticides Database

### General Search

1. Pest [hold Ctrl key to select multiple items]:

 All

2. Crop [hold Ctrl key to select multiple items]:

 All

3. State [hold Ctrl key to select multiple items]:

 All  
 AK  
 AL  
 AR

List only organic products [YES](#) [NO](#)

[Reset](#)

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# WHY USE BIOPESTICIDES?

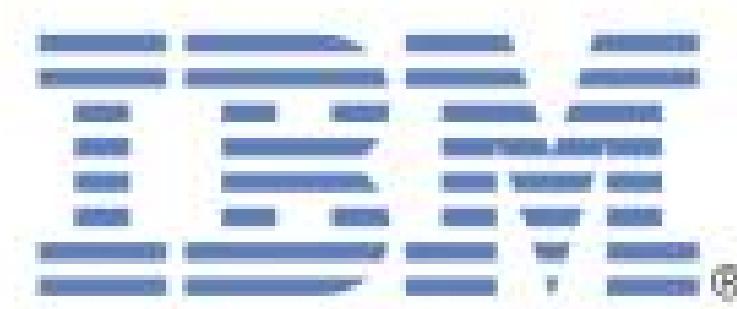
- 1. Resistance management**
- 2. Re-entry period**
- 3. Reduced time to harvest**
- 4. Residue management**

# Integrate Biopesticides and Conventional It's not Biopesticides versus Conventional

A BALANCED SYSTEM  
IS IMPORTANT!



Remember : Think Big Blue



Integrated  
Biopesticide  
Management