

# Conventional Cotton Varieties and Management of the Bollworm/Budworm Complex

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DELTA

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# FARM PRESS

TIMELY, RELIABLE INFORMATION FOR MID-SOUTH AGRICULTURE

## Cotton, rice, soybean yields climb higher

By Elton Robinson  
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USDA forecasted higher average yields for cotton, rice and soybeans in its Oct. 11 Crop Production report, and lowered average yield for corn once again. Several Mid-South states are projecting record rice yield.

U.S. rice production in 2012-13 is forecast at 198.9 million hundredweight, up  
(See MID-SOUTH, Page 2)

## Conventional cotton variety promising



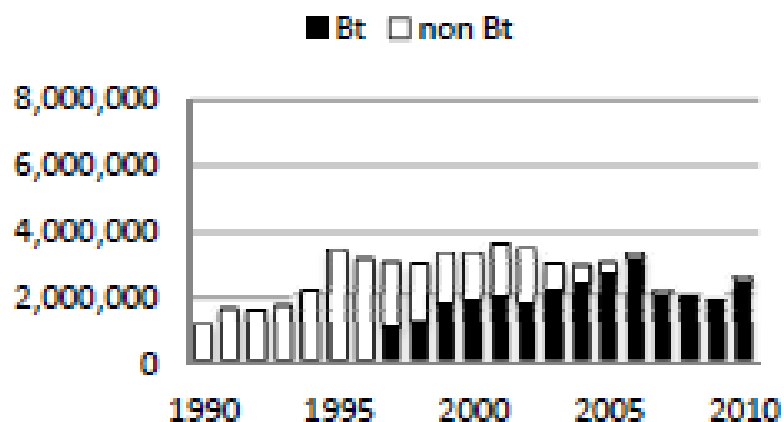
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Are the stars aligning for a revival of conventional cotton varieties? They could be for producer Keith Mayberry, who farms around Essex, Mo. This season, he planted 200 acres of AM UA48, a conventional variety developed by University of Arkansas plant breeder Fred Bourland and which was subsequently commercialized by Americot.

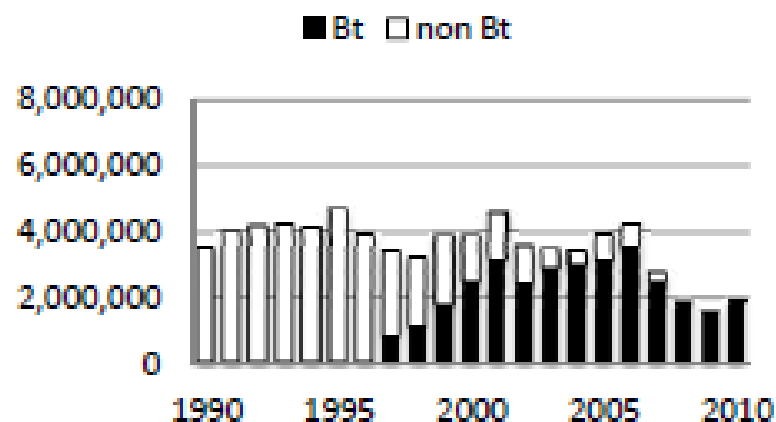
The variety boasts some interesting fiber properties — a staple range of 39-41, which is solidly in the premium range, and strength of 34-35. As the season was coming to a close, yield potential was also very promising for Mayberry.

Mayberry farms about 800 acres of cotton, 1,000 acres of corn, and 1,200 acres of soybeans with his sister, Kim Mayberry-Holfield, a sales representative for BASF

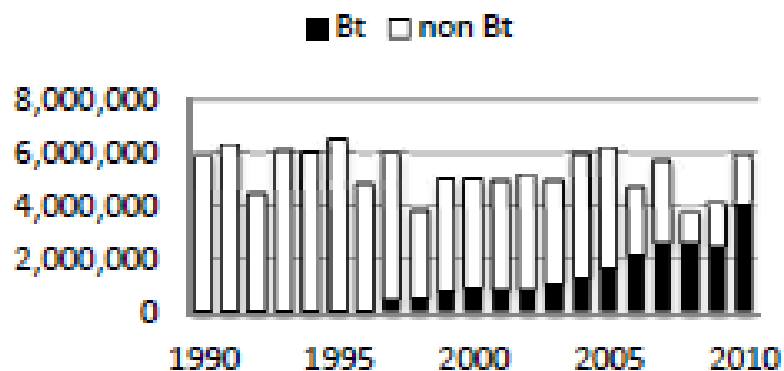
## Southeast Region



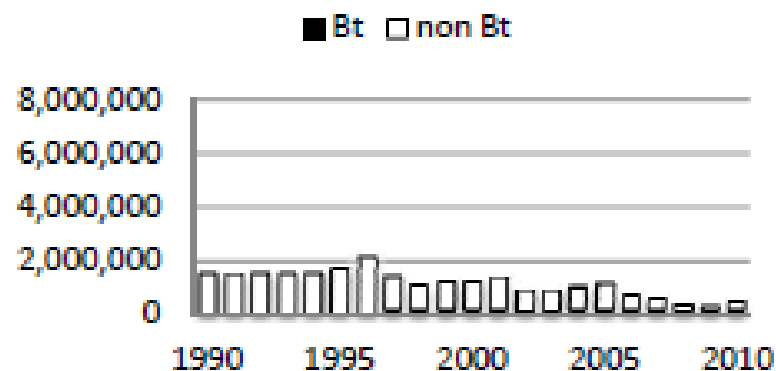
## Midsouth Region



## Southwest Region

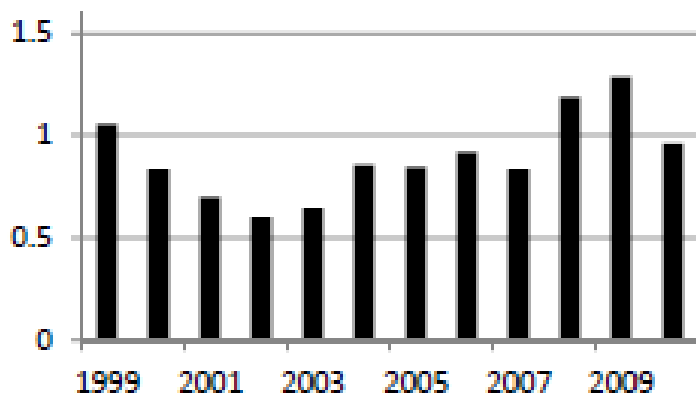


## West Region

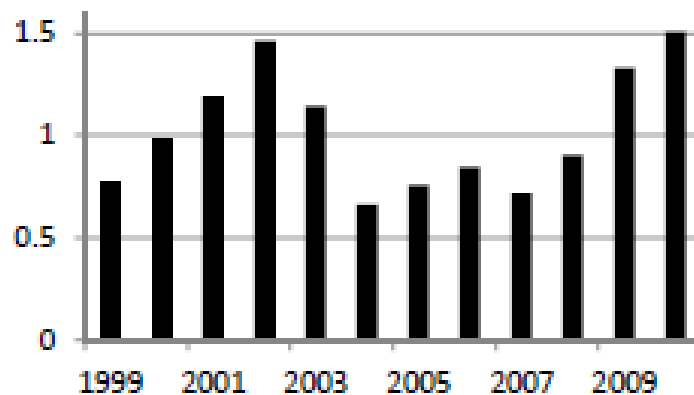


# Adoption of Bt Cotton in U.S. Cotton Belt

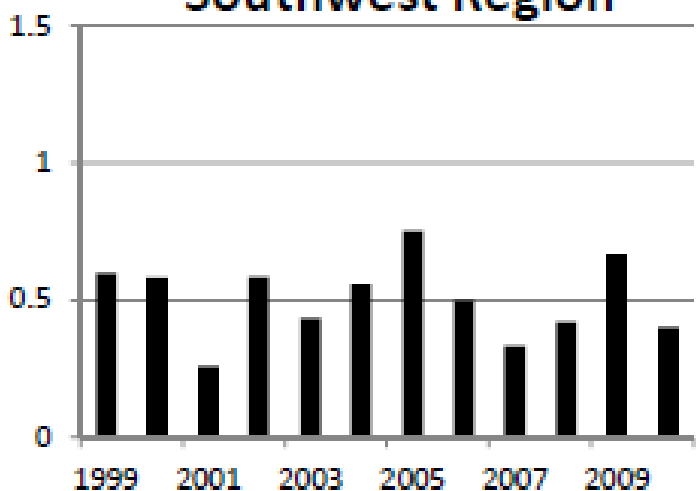
### Southeast Region



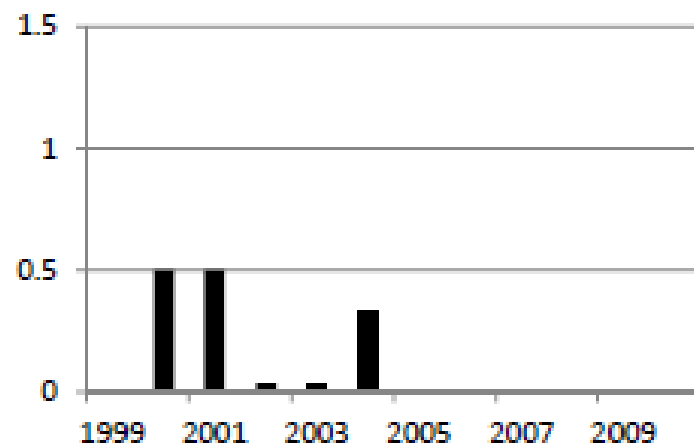
### Midsouth Region



### Southwest Region



### West Region



**Average Number of Bollworm Sprays Per Acre**

# Components of 2011 & 2012 Studies

- Cotton Varieties
  - Early Maturity Lines
    - Bourland Variety (BVAR) – ARK48
    - Conventional (non Bt) Comparison – DP121
    - Bollgard 2 Comparison – DP0912
    - Widestrike Comparison – PHY375
  - Full Season Lines
    - Meredith Variety (MVAR) – MD25
    - Conventional (non Bt) Comparison – DP174
    - Bollgard 2 Comparison – DP1048
    - Widestrike Comparison – PHY499
- Insecticide Spray Options
  - Untreated
  - Sprayed with Karate (pyrethroid)
  - Sprayed with Prevathon (diamide)

# Components of 2011 & 2012 Studies

- Cage Studies (1/8 acre)
  - Release of high densities of *H. zea* and *H. virescens* moths
  - 1 or 2 applications of Karate, Prevathon (Coragen)
  - Weekly plant maps, end-of-season box map
- Replicated Plot Studies – Stoneville
  - Split plot – untreated, Prevathon (Coragen), Karate sprays based on average scouting data for treatment and MSU larval thresholds
- On-Farm Comparisons
  - 4 locations in 2011, 10 locations in 2012
  - Same treatments as Cage and Replicated Plot studies, varieties varied to some extent, no ARK48 or MD25

# 2011& 2012 Cage Studies

- Three 1/8 acre cages – each with seven varieties managed without insecticide, treated with Karate twice, treated with Coragen twice
- Cages infested three times (1<sup>st</sup> bloom, 1<sup>st</sup> bloom + 2 weeks, 1<sup>st</sup> bloom + 4 weeks) – 400 *H. zea* and 400 *H. virescens* released each time
- Plants mapped weekly for insect damage and fruit retention on first positions
- Plants box mapped at harvest for yield and maturity
- Data studied by AOV and yield plotted versus estimated time post cotyledon (assume 3 days for mainstem node expansion and 6 days for branch nodes)





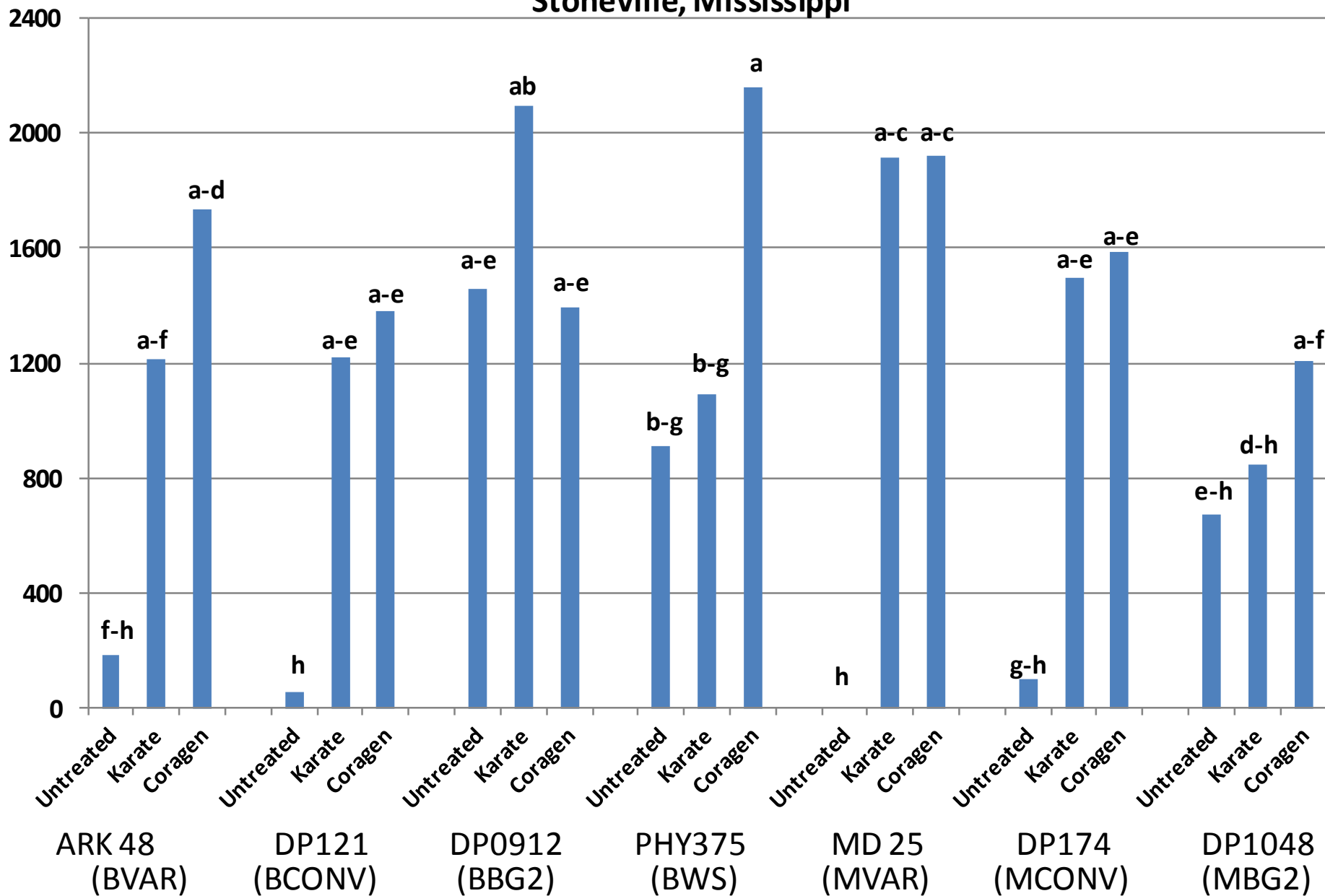


## Analysis of Variance

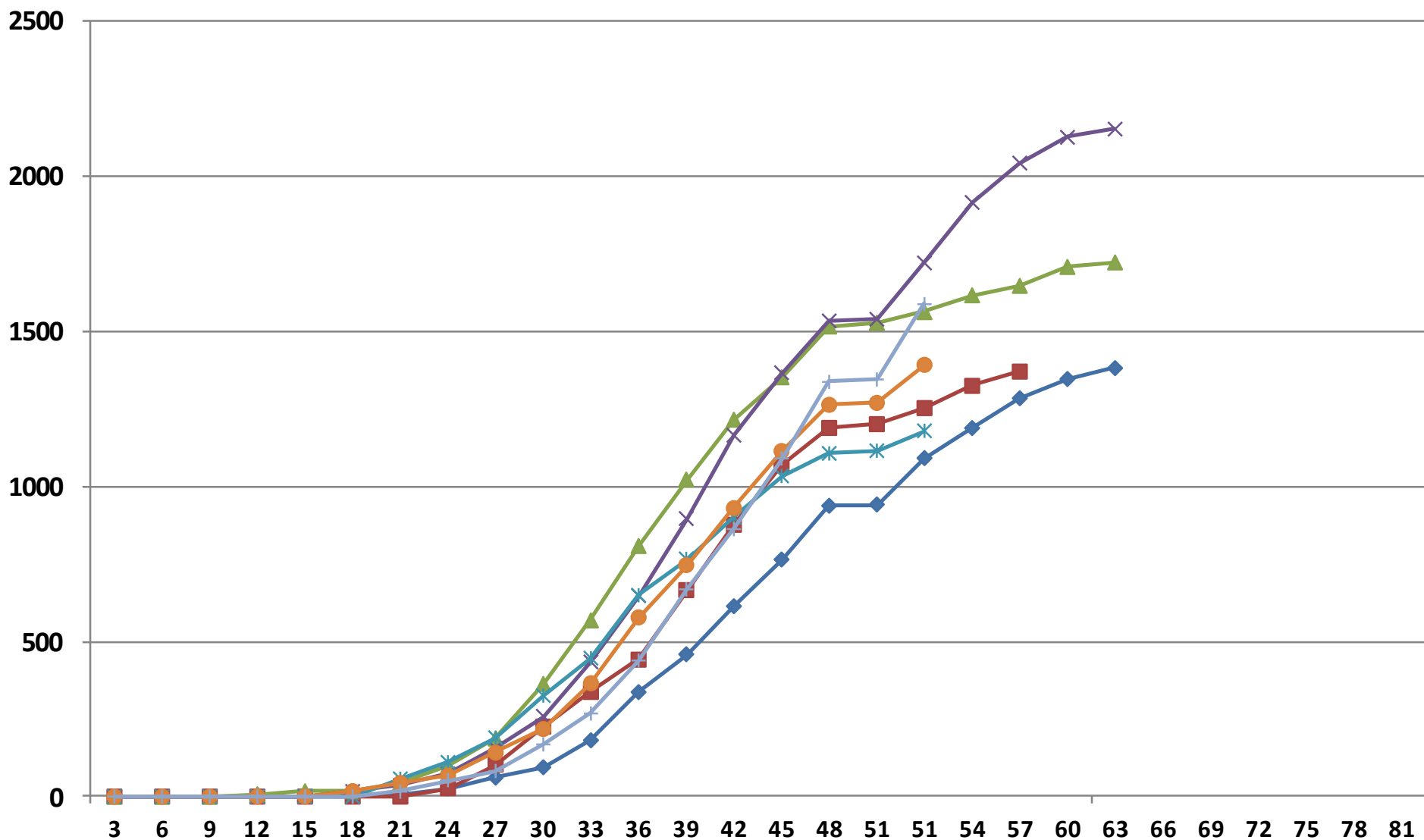
### Response – Lint Yield Per Acre (Box Mapping of Cage Study)

| <b>Source</b>                | <b>df</b> | <b>F ratio</b> | <b>Prob. &gt; F</b> |
|------------------------------|-----------|----------------|---------------------|
| <b>Variety</b>               | <b>6</b>  | <b>1.8089</b>  | <b>0.1206</b>       |
| <b>Insecticide</b>           | <b>2</b>  | <b>19.6442</b> | <b>&lt;0.0001</b>   |
| <b>Variety * Insecticide</b> | <b>12</b> | <b>1.4745</b>  | <b>0.1728</b>       |

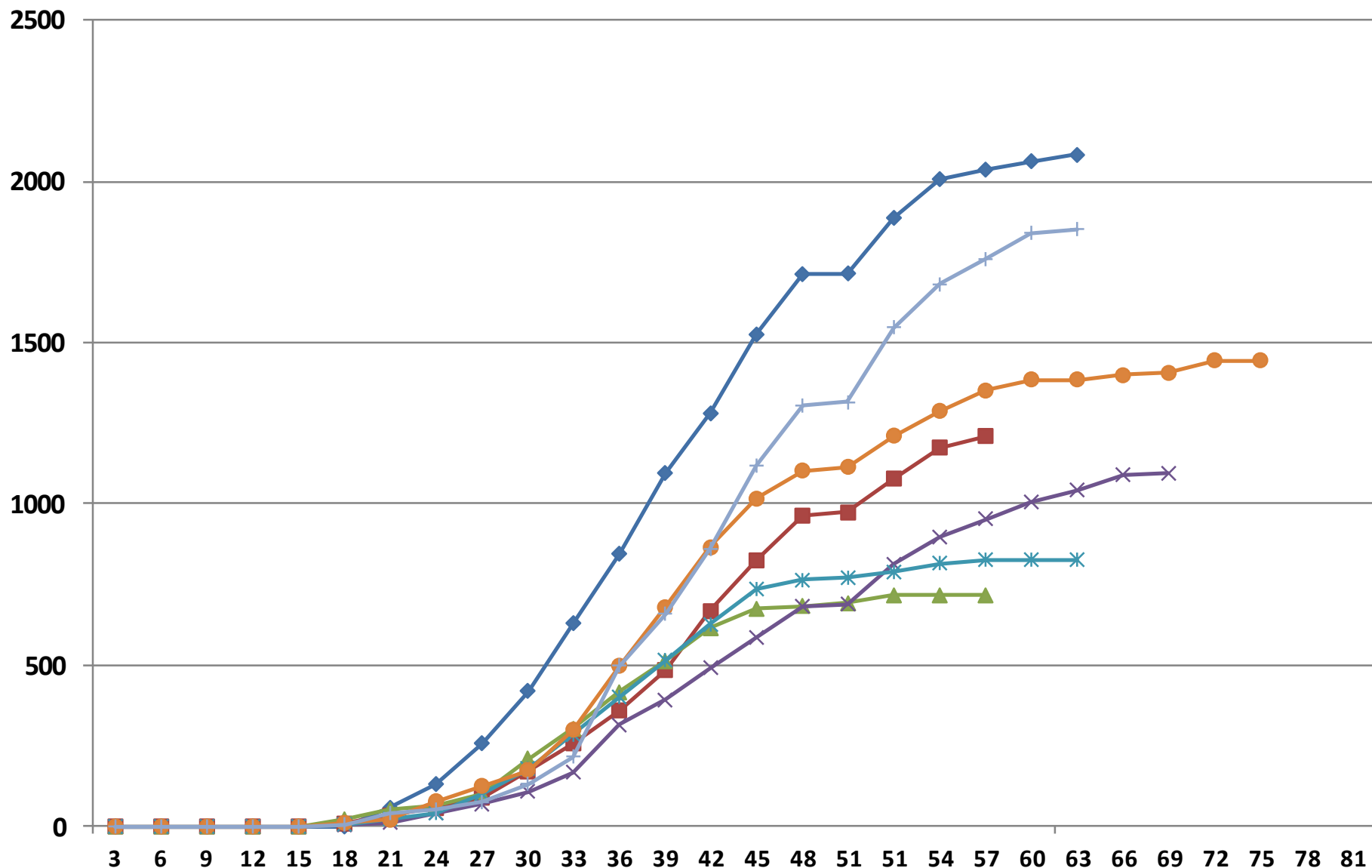
**Lint Yield Per Acre – 2011 Value Added – Box Mapping of Cage Study**  
**USDA, ARS Southern Insect Management Research Unit**  
**Stoneville, Mississippi**



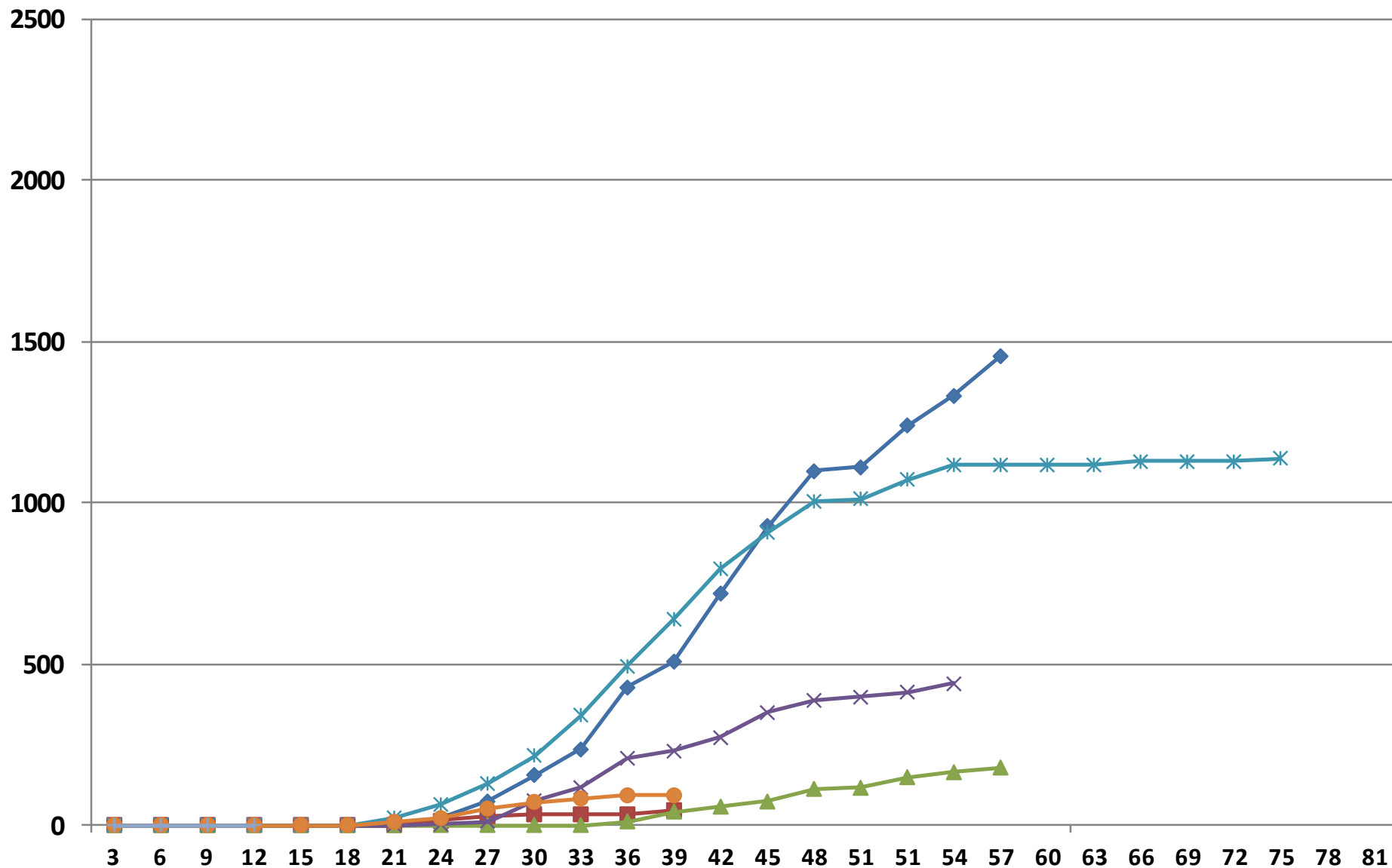
DP0912-Coragen DP121-Coragen ARK48-Coragen PHY375-Coragen  
DP1048-Coragen DP174-Coragen MD25-Coragen



DP0912-Karate DP121-Karate ARK48-Karate PHY375-Karate  
DP1048-Karate DP174-Karate MD25-Karate



DP0912-Untreated DP121-Untreated ARK48-Untreated PHY375-Untreated  
DP1048-Untreated DP174-Untreated MD25-Untreated



# Summary

- Under conditions of extreme insect damage, unsprayed non-Bt did not produce economic yield. No yield in some instances.
- No difference observed among varieties in yield when treated with Coragen.
- Yields of most varieties treated with Karate were statistically similar to those treated with Coragen, except for PHY375.

# Summary

- Coragen treated non Bt cottons (ARK 48, DP121, MD25, and DP174) were as good as or better than some untreated Bt cottons.
- First year results suggest that high yielding non Bt cottons can be protected from extreme insect pressure if managed correctly.
- Additional work needed to refine estimates of damage rates and repeatability of first year observation.

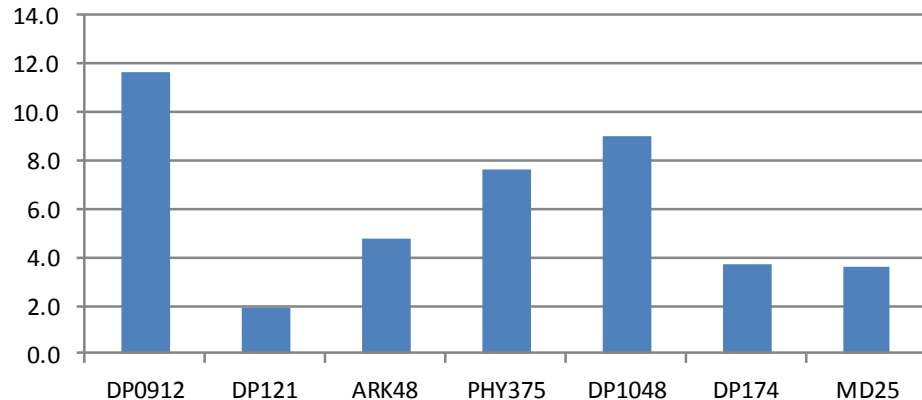
# Total Bolls Counted on Plant Maps on August 15

Release 200 zea and 200 virecens/cage  
on 7/18 and 7/24

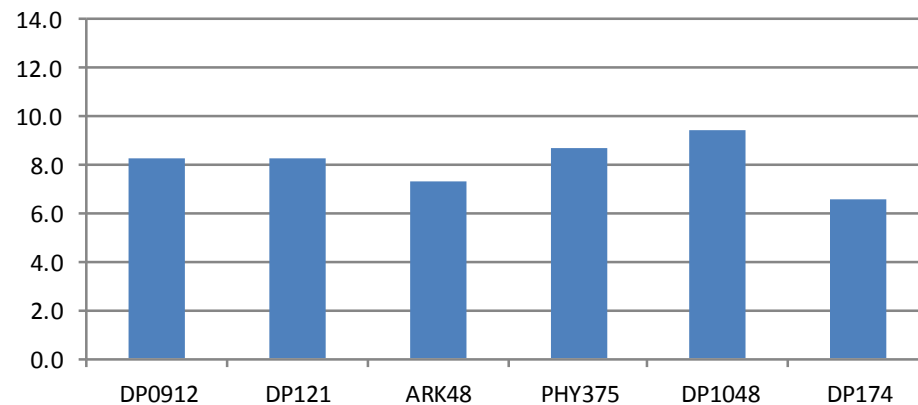
Spray 1<sup>st</sup> time on 7/24, Spray 2<sup>nd</sup> time  
on 8/2

## Plant Map – Cage Study August 15, 2012

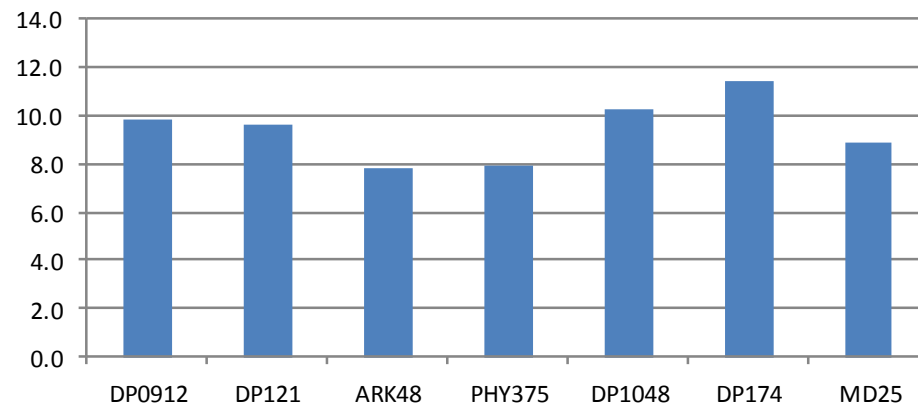
**Bolls/Plant  
Untreated**



**Bolls/Plant  
1 Spray Karate**

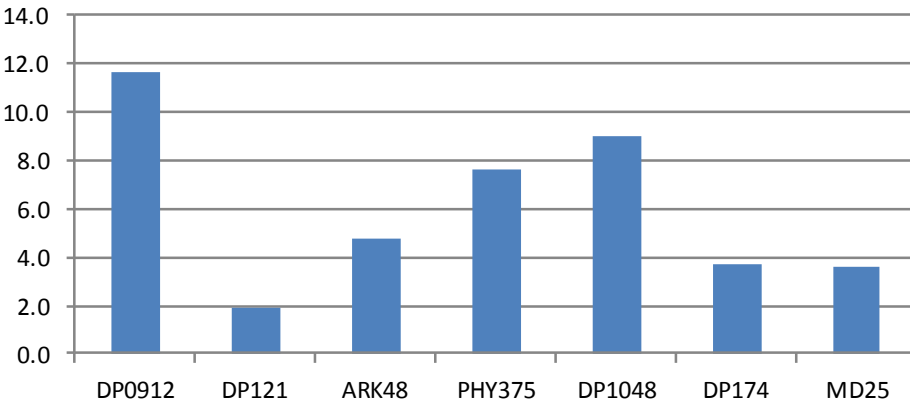


**Bolls/Plant  
2 Sprays Karate**

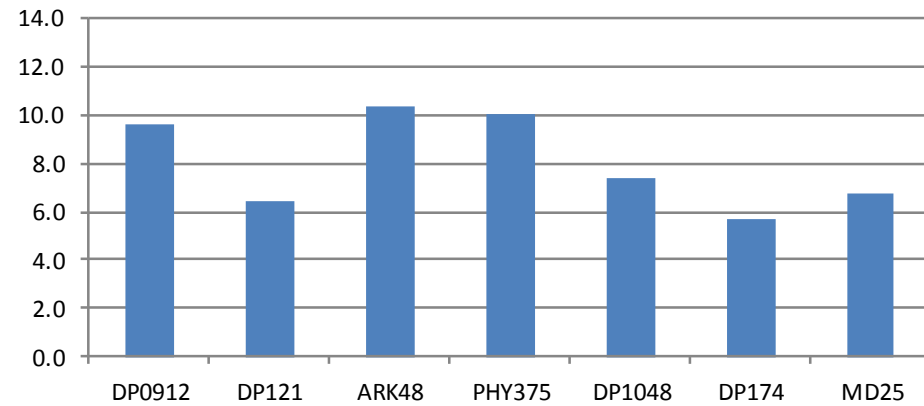


## Plant Map – Cage Study August 15, 2012

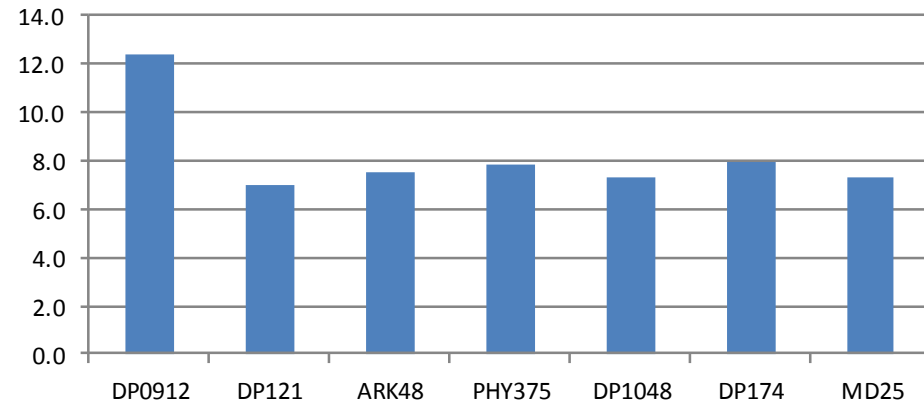
**Bolls/Plant**  
**Untreated**



**Bolls/Plant**  
**1 Spray Prevathon**

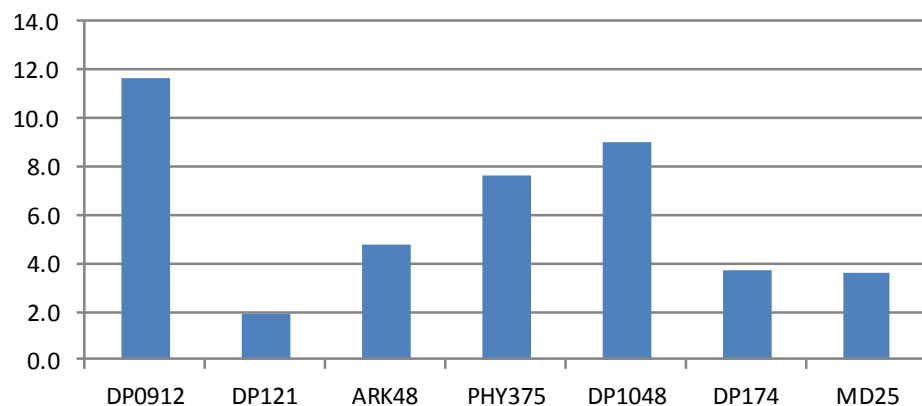


**Bolls/Plant**  
**2 Sprays Prevathon**

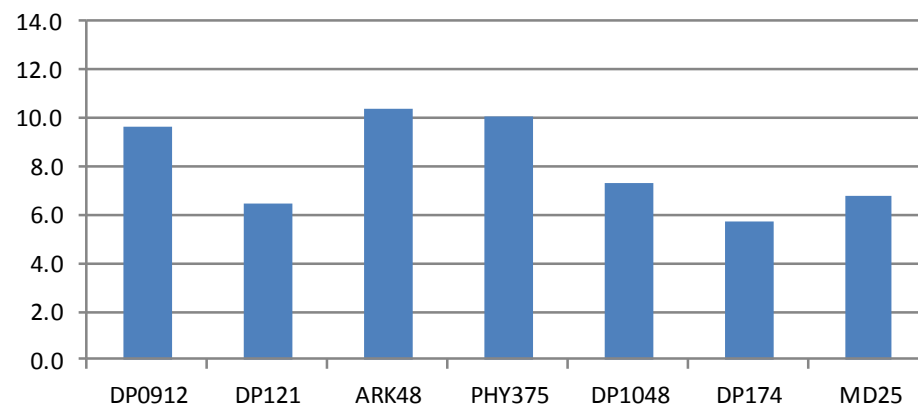


## Plant Map – Cage Study August 15, 2012

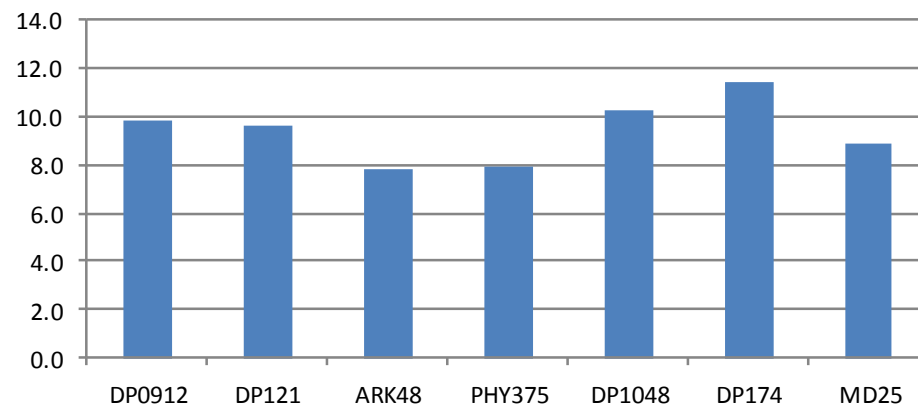
**Bolls/Plant  
Untreated**



**Bolls/Plant  
1 Spray Prevathon**

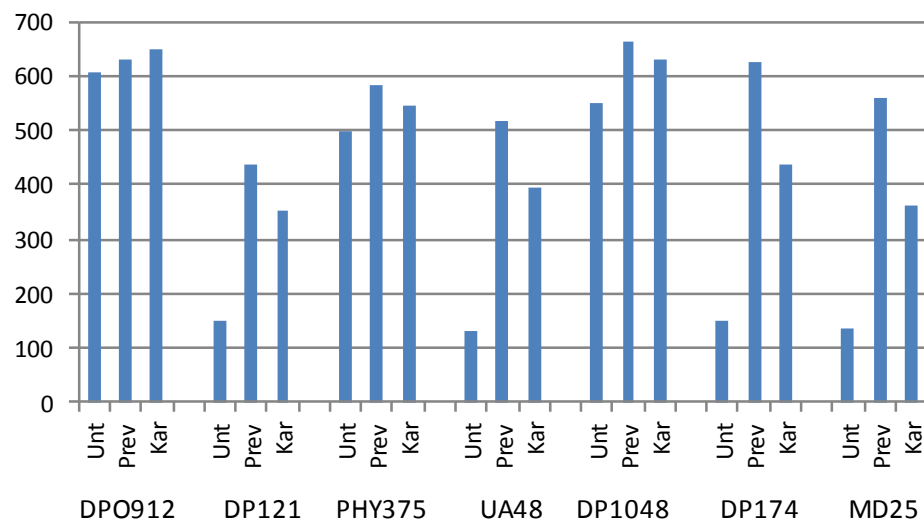


**Bolls/Plant  
2 Sprays Karate**

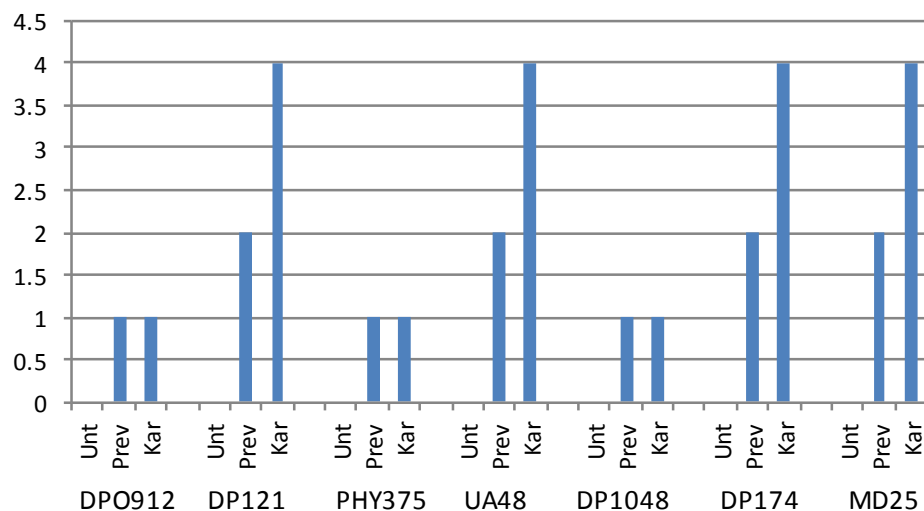




## Yield (lb lint/acre)

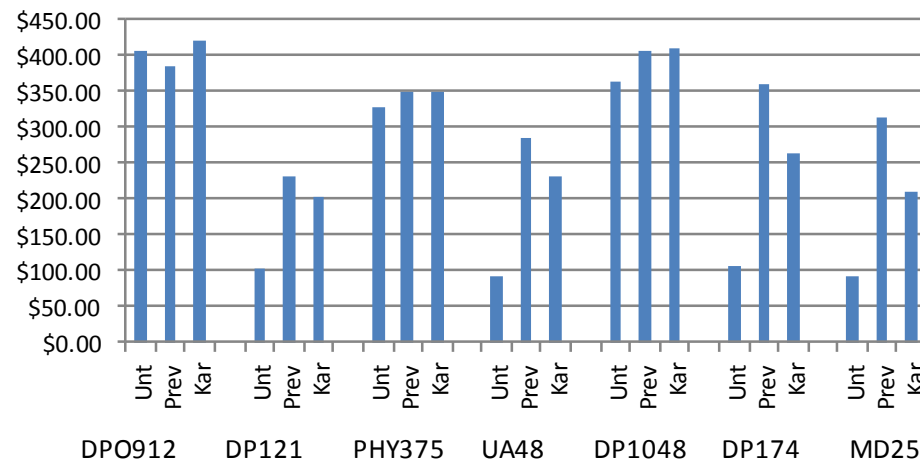


## No. Sprays



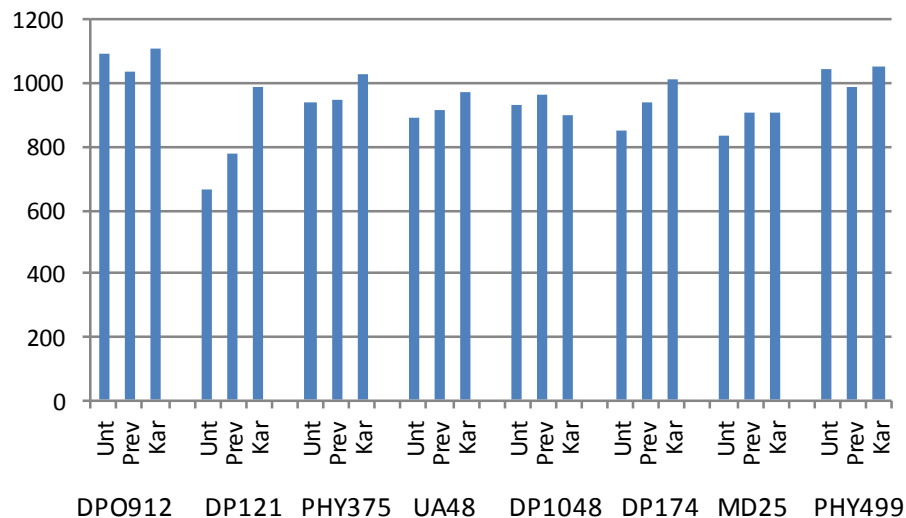
## Ryan Jackson Plot Study Stoneville, Mississippi 2011

## Returns Above Lepidoptera Control (\$0.70 cotton -- 2011)

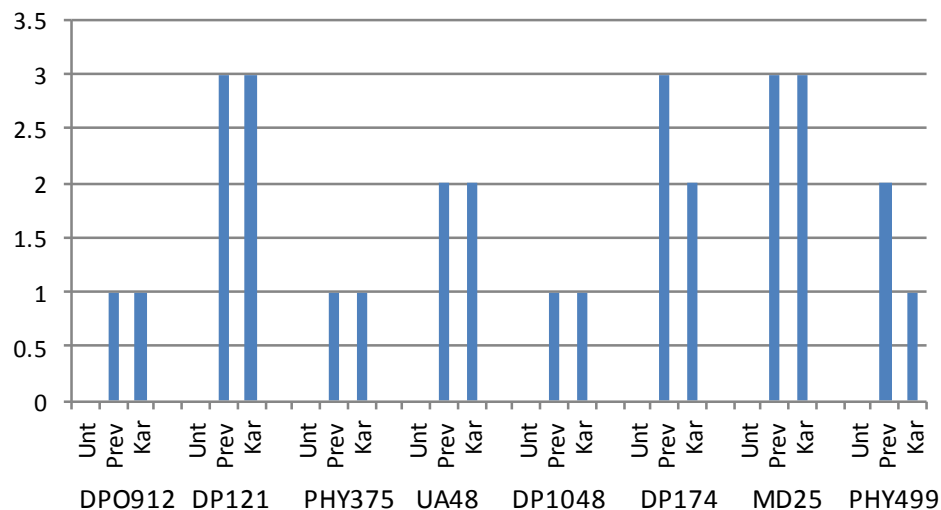


**Estimated Lepidoptera Control Costs/Acre**  
**Bt Technology Fee -- \$20.25**  
**Karate + Application -- \$11.00**  
**Prevathon + Application -- \$37.75**

## Yield (lb lint/acre)

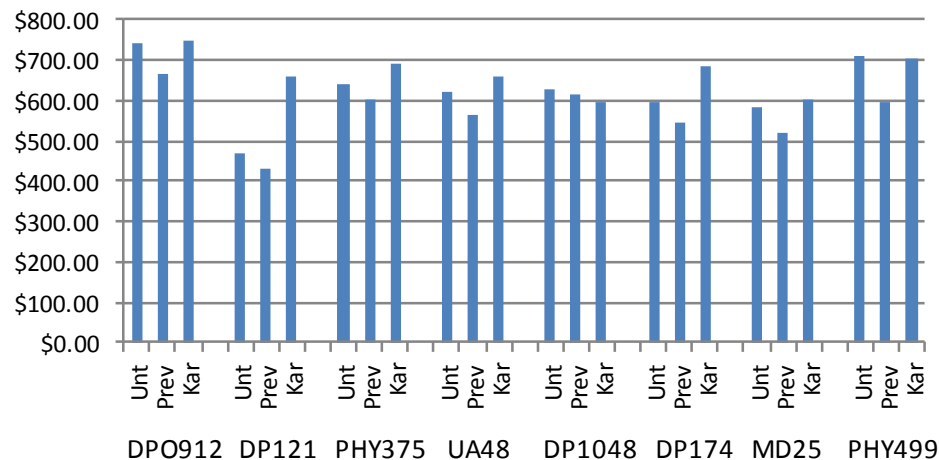


## No. Sprays



## Ryan Jackson Plot Study Stoneville, Mississippi 2012

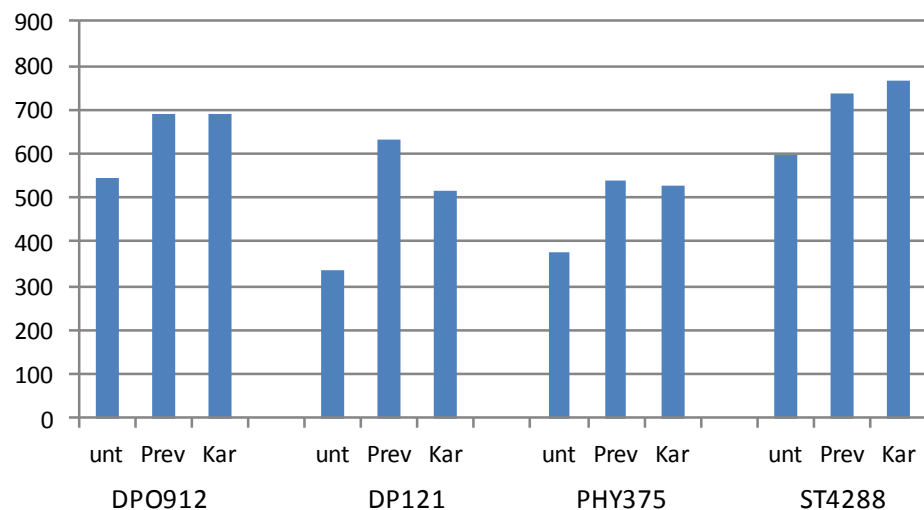
## Returns Above Insect Control (\$0.70 cotton -- 2012)



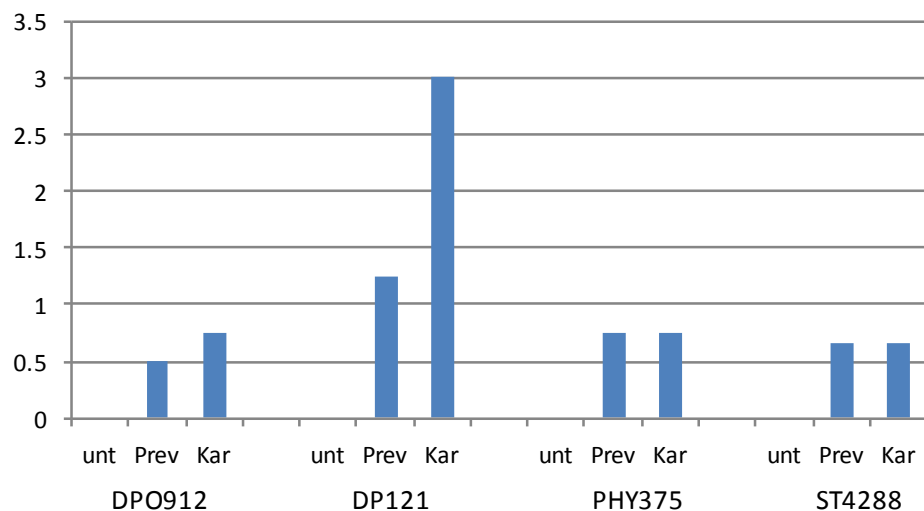
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## Yield (lb lint/acre)

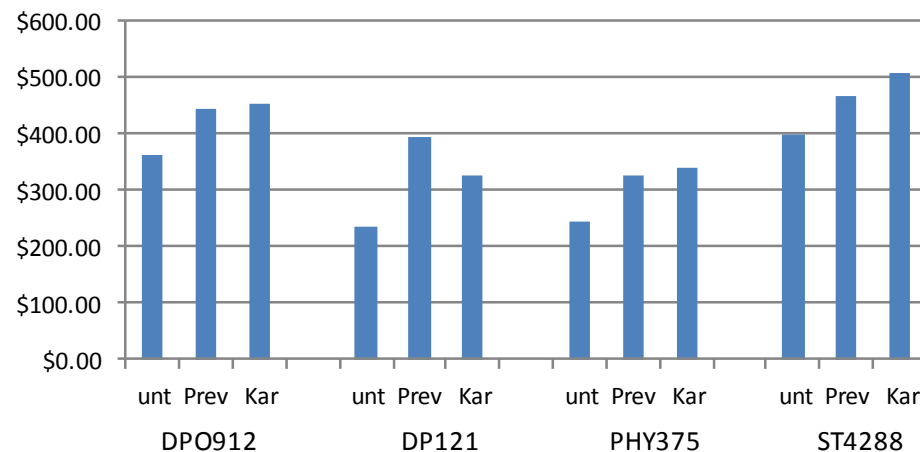


## No Sprays



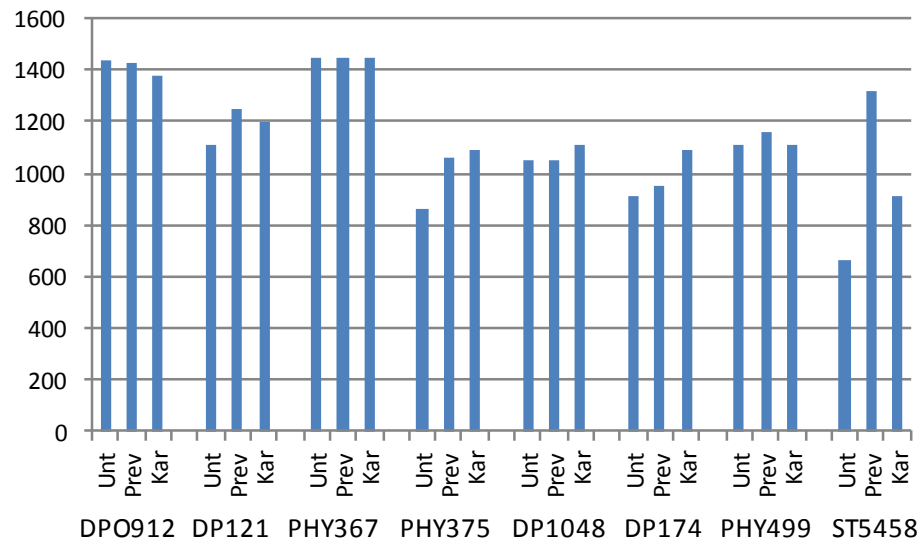
## Ryan Jackson Delta Farm Plot Study 2011

## Returns Above Lepidoptera Control (&0.70 cotton)

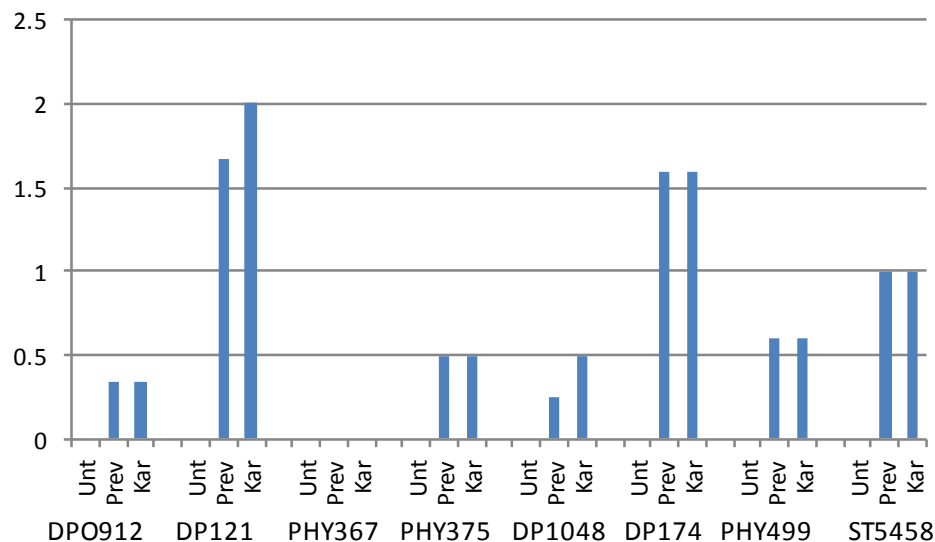


**Estimated Lepidoptera Control Costs/Acre**  
 Bt Technology Fee -- \$20.25  
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## Yield (lb lint/acre)

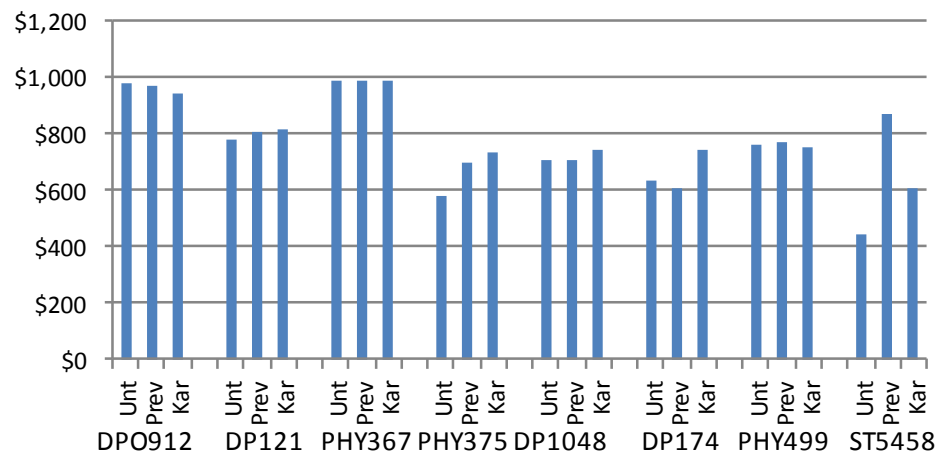


## No. Sprays



## Ryan Jackson Delta Farm Plot Study 2012

## Returns Above Lepidoptera Control (\$0.70 cotton -- 2012)



**Estimated Lepidoptera Control Costs/Acre**  
**Bt Technology Fee -- \$20.25**  
**Karate + Application -- \$11.00**  
**Prevathon + Application -- \$37.75**

## Ranked Yield Response

|           | Cage 2011 | Cage 2012 | Stn Fld 2011 | Stn Fld 2012 | Combined |
|-----------|-----------|-----------|--------------|--------------|----------|
| BG2       | 10.8      | 11.0      | 9.7          | 8.0          | 6.9      |
| WS        | 10.0      | 5.6       | 4.2          | 7.0          | 9.7      |
| nonBt     | 11.3      | 13.7      | 14.8         | 13.8         | 13.4     |
| Prevathon | 6.7       | 12.0      | 6.8          | 11.0         | 9.1      |
| Karate    | 9.4       | 6.7       | 11.1         | 7.7          | 8.7      |
| Untreated | 16.8      | 14.3      | 15.0         | 14.3         | 15.1     |
| early     | 9.5       | 10.8      | 11.3         | 9.5          | 10.2     |
| full      | 14.0      | 11.3      | 10.6         | 13.0         | 12.1     |

*Interactions must be considered.*

*Different environments require different combinations of insect management options.*

- Bt technologies provide economic control of Lepidoptera.
- Options for managing Lepidoptera include new insecticides (Prevathon) and high yielding nonBt varieties.
- Spraying Bt cotton may be cost effective. Choice of insecticide and efficient management depends upon a knowledge of the abundance and types of insect pests present.
- Under some situations early maturing varieties avoid late season insect damage.
- Controlling bollworm/tobacco budworm is important when damaging densities are present.
- Damaging densities are not always present.

