Mid-South Evaluation of Plant Bug Sampling and Treatment Thresholds

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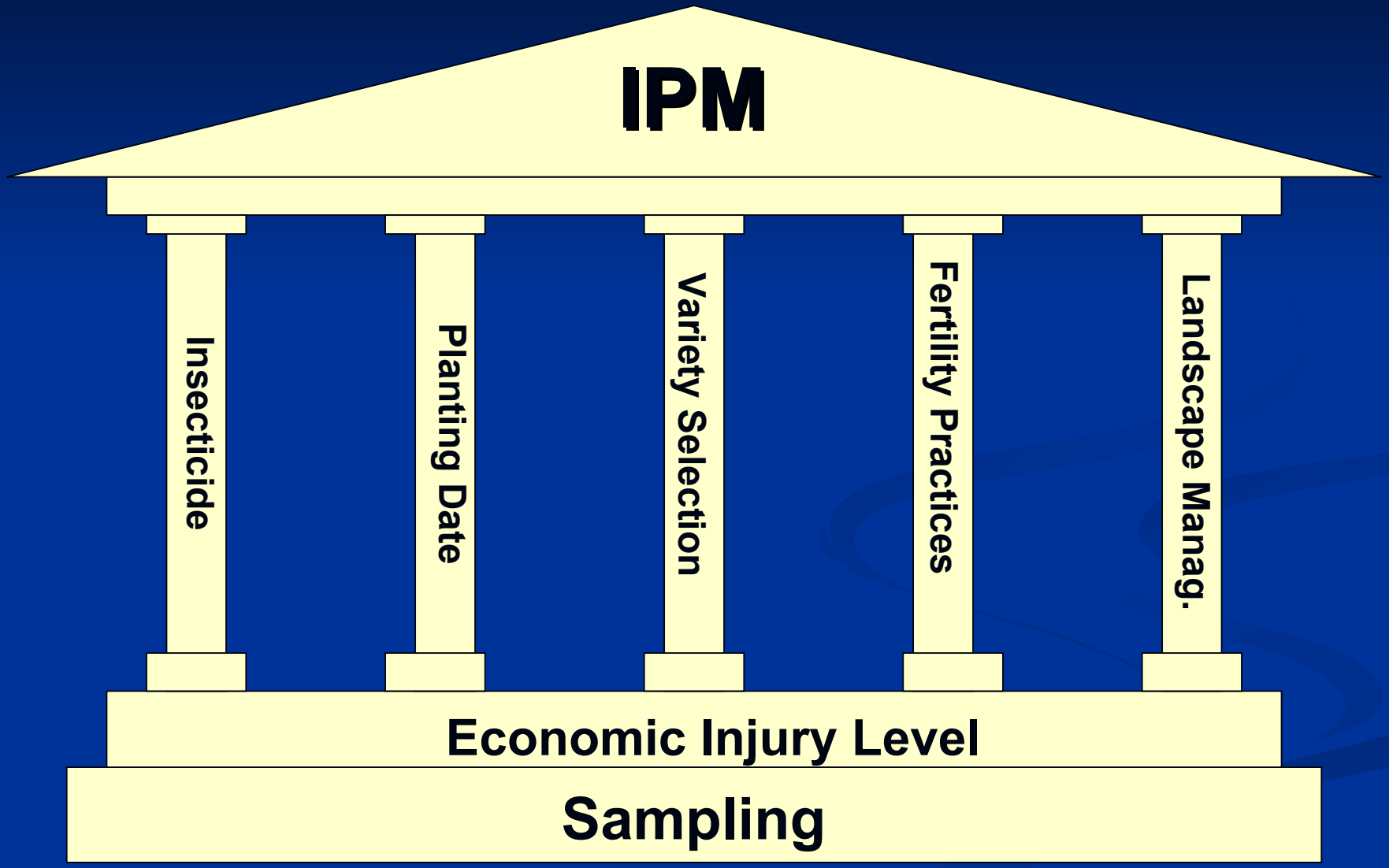
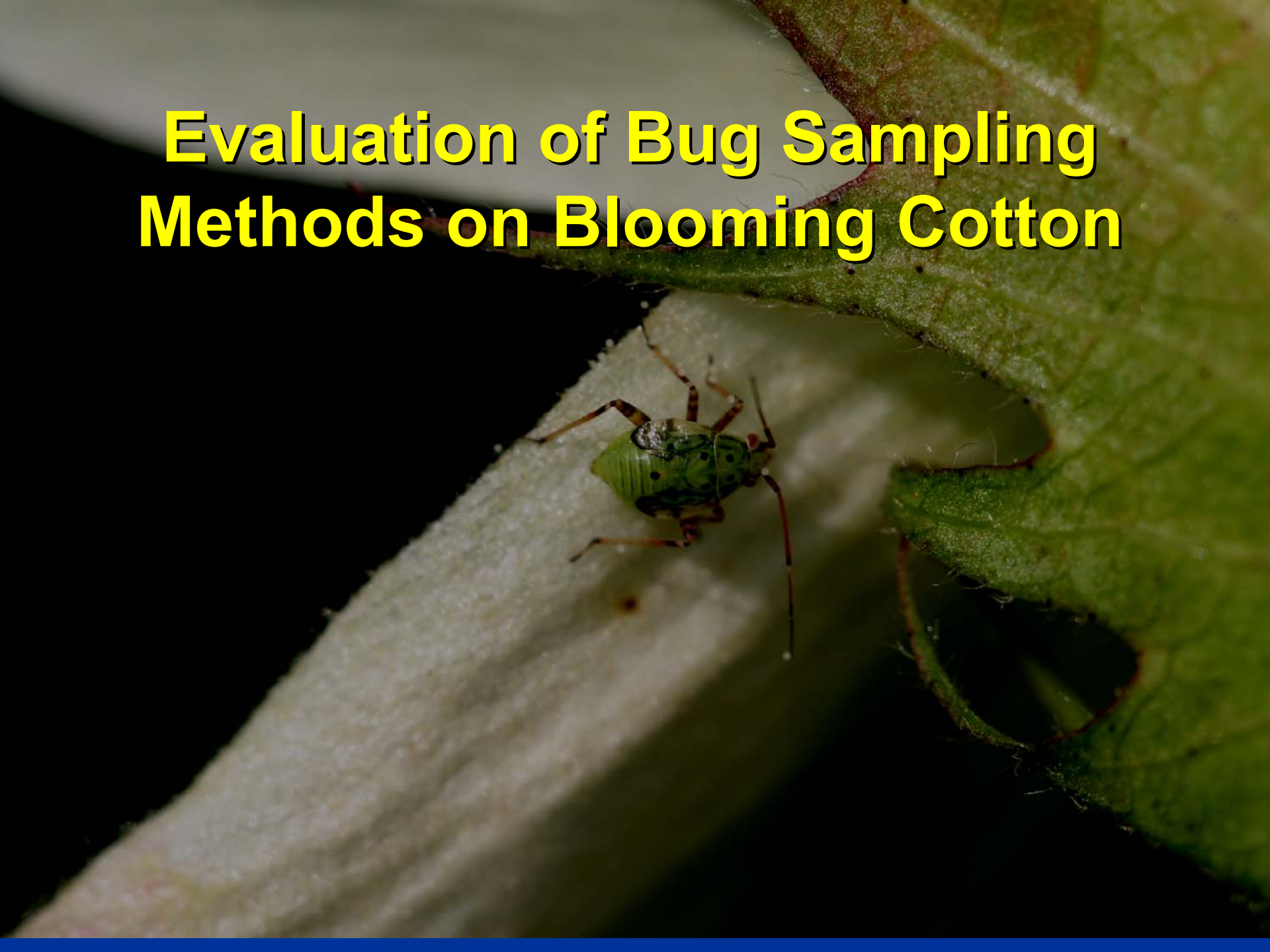

IPM
Insecticide
Planting Date
Variety Selection
Fertility Practices
Landscape Manag.
Economic Injury Level
Sampling

Evaluation of Bug Sampling Methods on Blooming Cotton



Bug Sampling Objectives

- **Identify efficient and accurate TPB sampling methods in mid-season cotton**
- **Verify or adjust current TPB thresholds**
- **Standardize recommended scouting procedures and thresholds in the mid-south**

2005 Sampling Methods

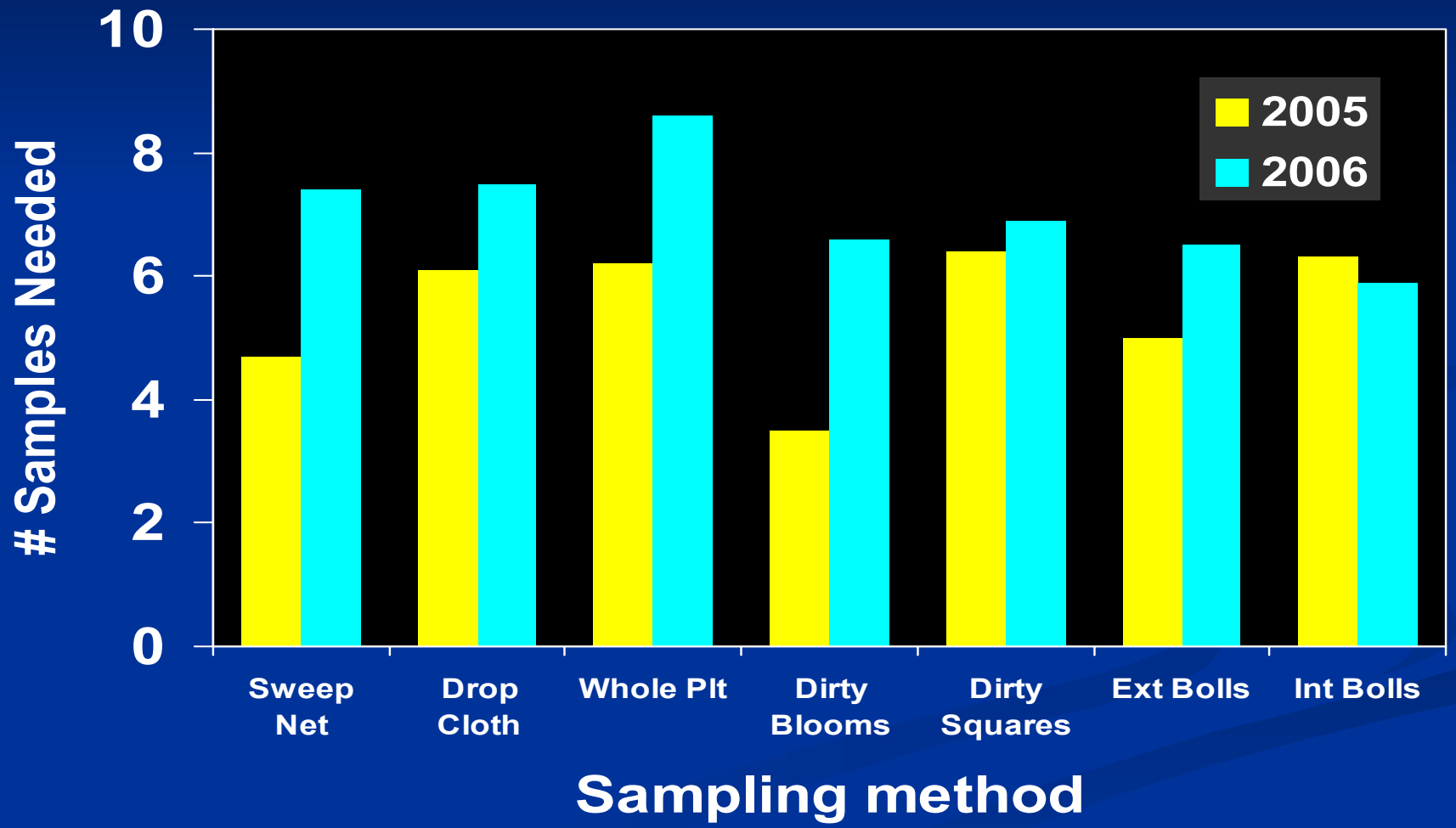
- 120 commercial fields in TN, MS, LA, AR
- 4 sites in each field
- 5 direct sampling methods (# bugs, time)
- 4 indirect sampling methods (damage, time)

2006 Sampling Methods

- 60 commercial fields in TN, MS, LA, AR
- 4 sites in each field
- 3X per day (6-9 AM, 11 AM-2 PM, 4-7 PM)
- 3 direct sampling methods (# bugs, time)
- 4 indirect sampling methods (damage, time)

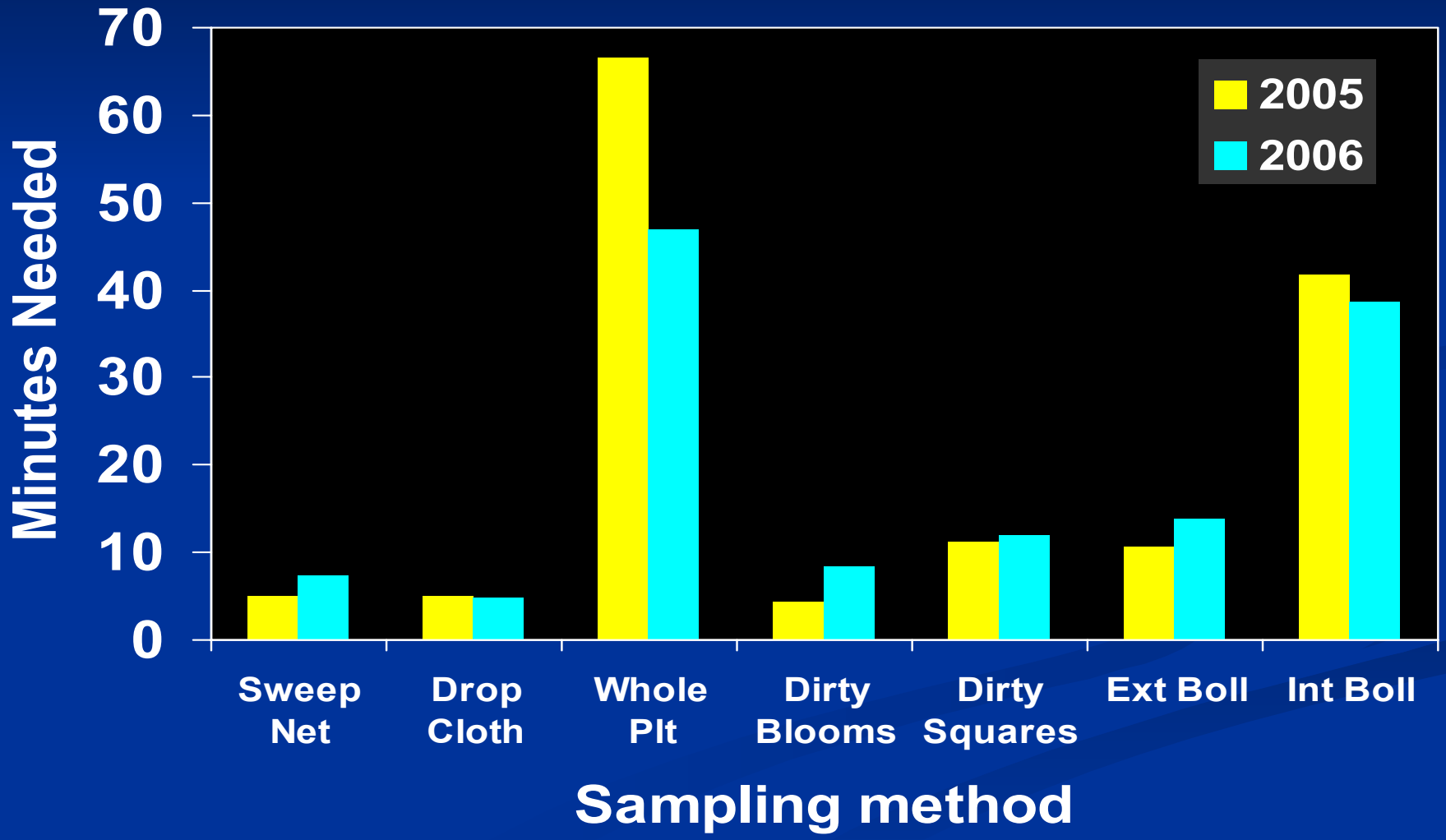
Sampling Precision, 2006

samples needed to make a correct decision 80% of the time when the actual pest density is 20% > threshold

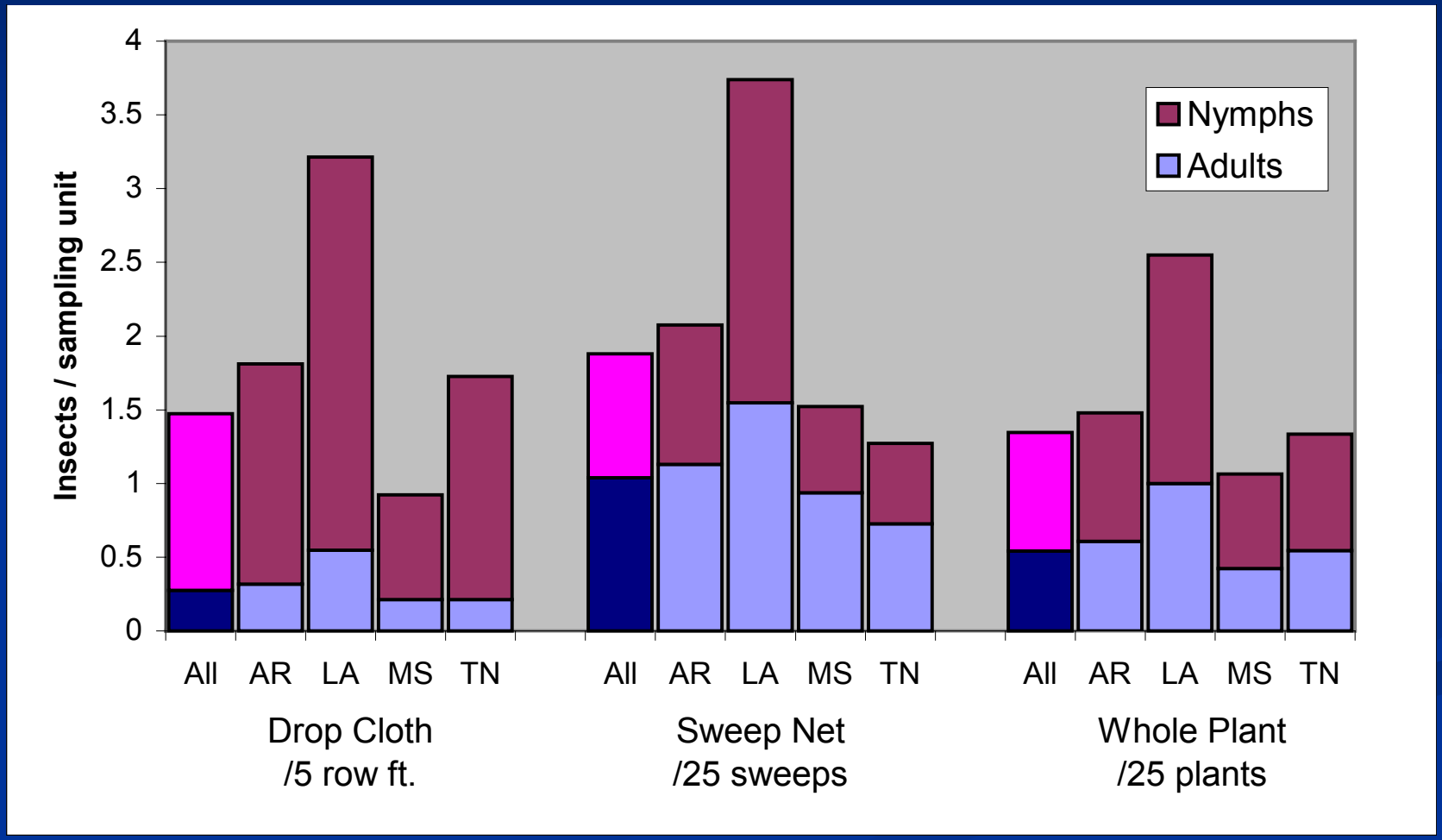


Sampling Efficiency, 2006

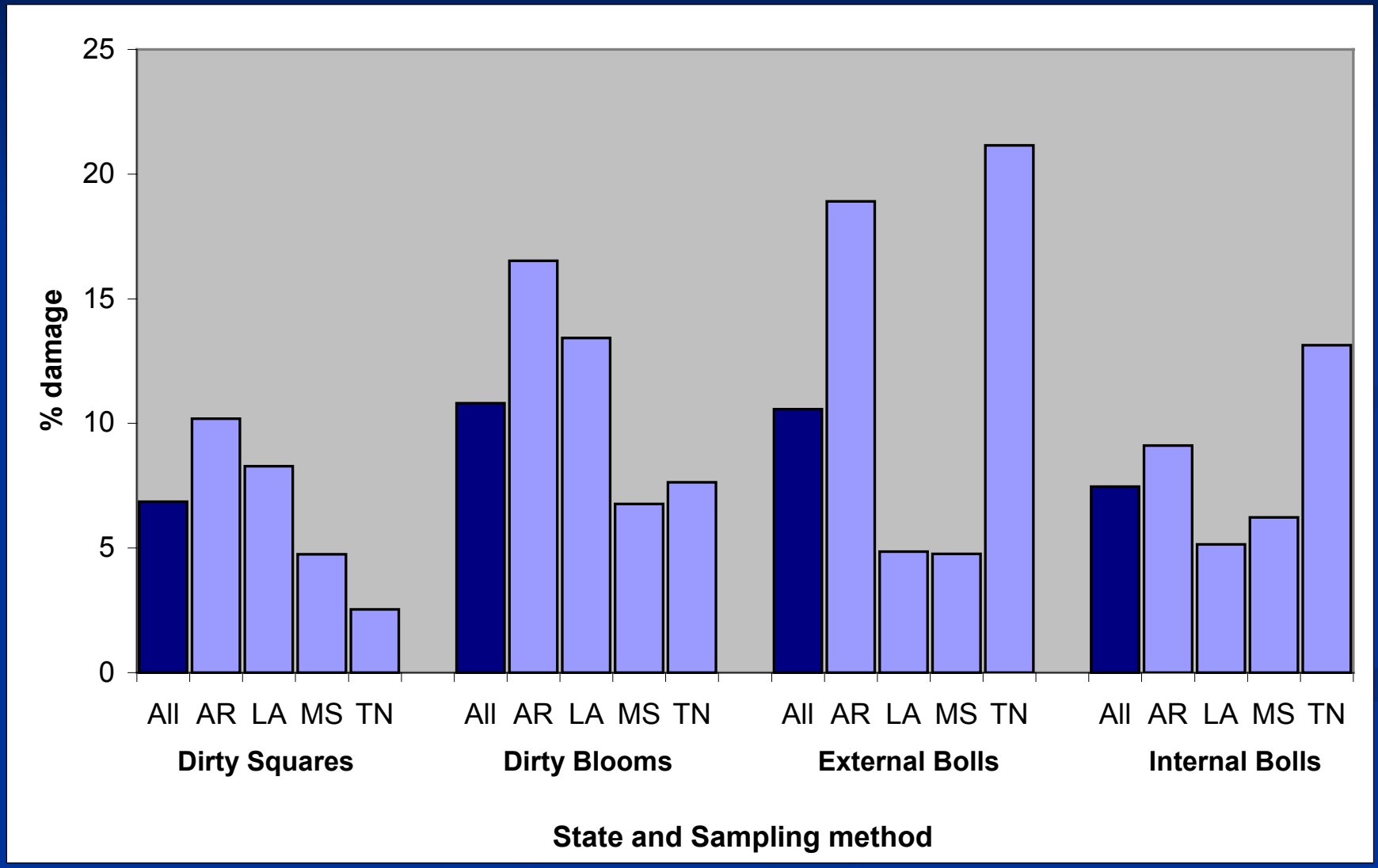
Minutes needed to make a correct decision 80% of the time when the actual pest density is 20% > threshold



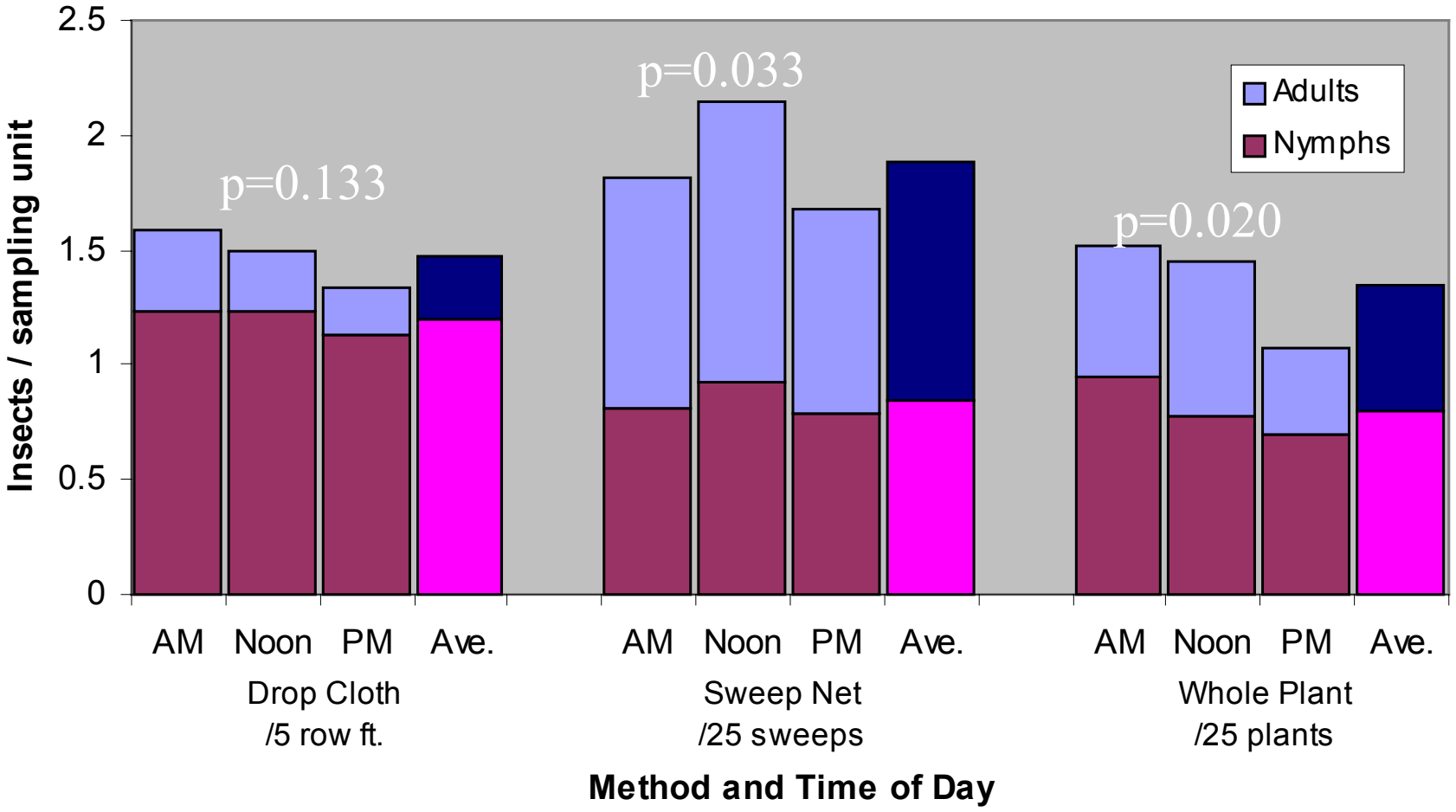
Average Number of Plant Bugs per Sample by State, 2006



Average % Damage by State, 2006



Time of Day Variation



Sampler Impact by Method

Method	F- value	P-value
Drop Cloth	3.08	<0.0001
Sweep Net	2.77	<0.0001
Whole Plant	3.51	<0.0001
Dirty Squares	1.69	0.0380
Dirty Blooms	2.26	0.0025
Ext. Bolls	5.63	<0.0001
Int. Bolls	3.34	<0.0001

Other Factors Altering Bias Both Years

Factors monitored: temperature, wind speed, cloud cover, plant height, nodes, NAWF

Factor	Change
Wind	↓ PB with ↑ wind using whole plant sampling

Sampling Methods Summary

- Direct Sampling methods
  - Sweep net is most efficient for adults
  - Drop cloth most efficient for nymphs
  - Sweep net and drop cloth similar for total bug efficiency
  - Counts by all methods decrease during the hottest part of the day (3-6 PM), but drop cloth least affected
  - Sweep nets catch fewer when foliage is wet
- Indirect sampling methods
  - Dirty blooms most efficient
  - Dirty Squares least impacted by sampler

Developing Bug Treatment Thresholds on Blooming Cotton

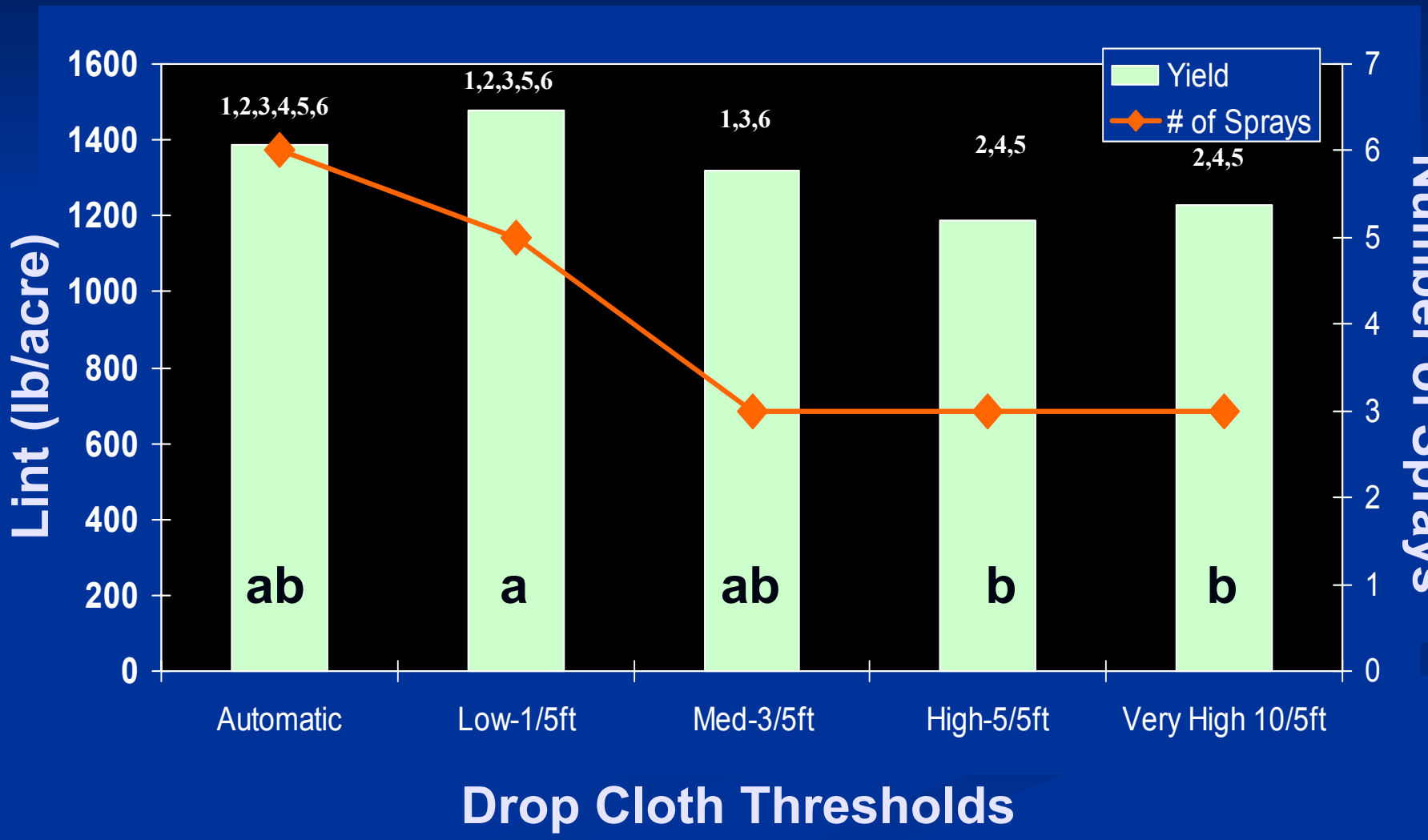
TPB Thresholds- Mid Season

Trial Treatments

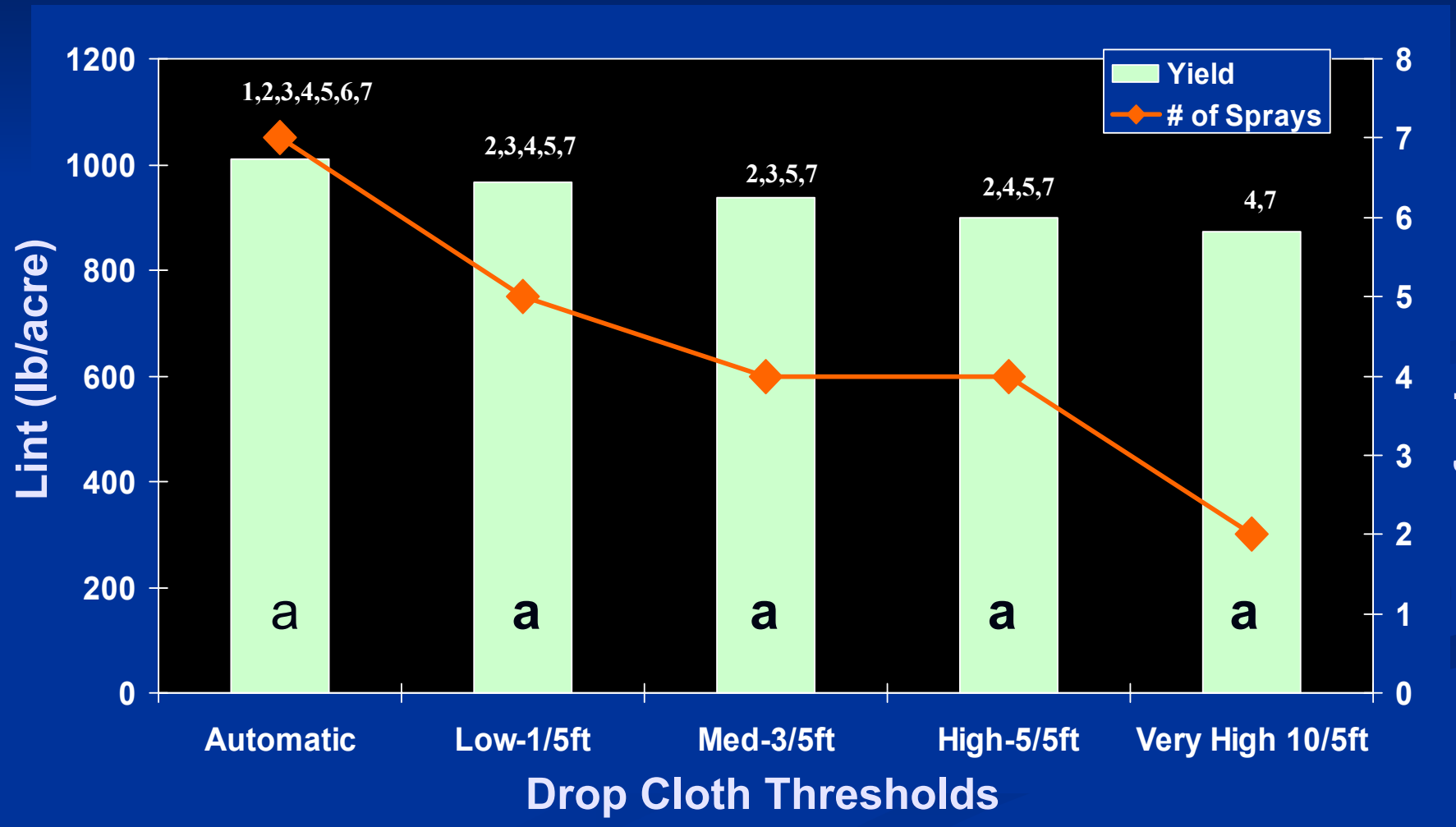
- **Auto:** Insecticide application every 7 days from first bloom to cutout
- **Low:** Threshold of 1 PB / 5 row ft.
- **Med:** Threshold of 3 PB / 5 row ft.
- **High:** Threshold of 5 PB / 5 row ft.
- **VHigh:** Threshold of 10 PB / 5 row ft.

All applications made using acephate, Bidrin, or Vydate

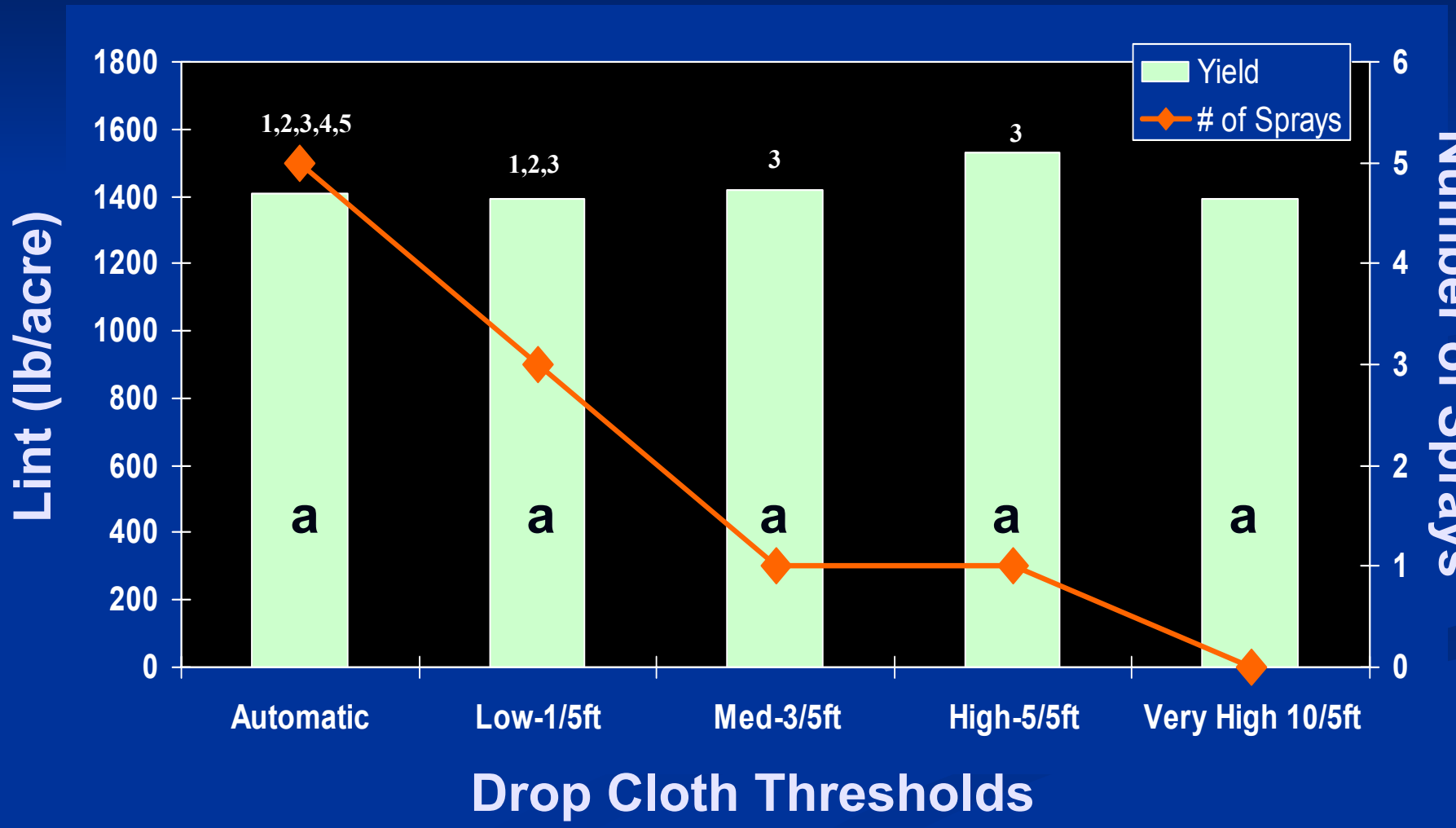
Mid-Season TPB Thresholds
Catchot - MS, 2006



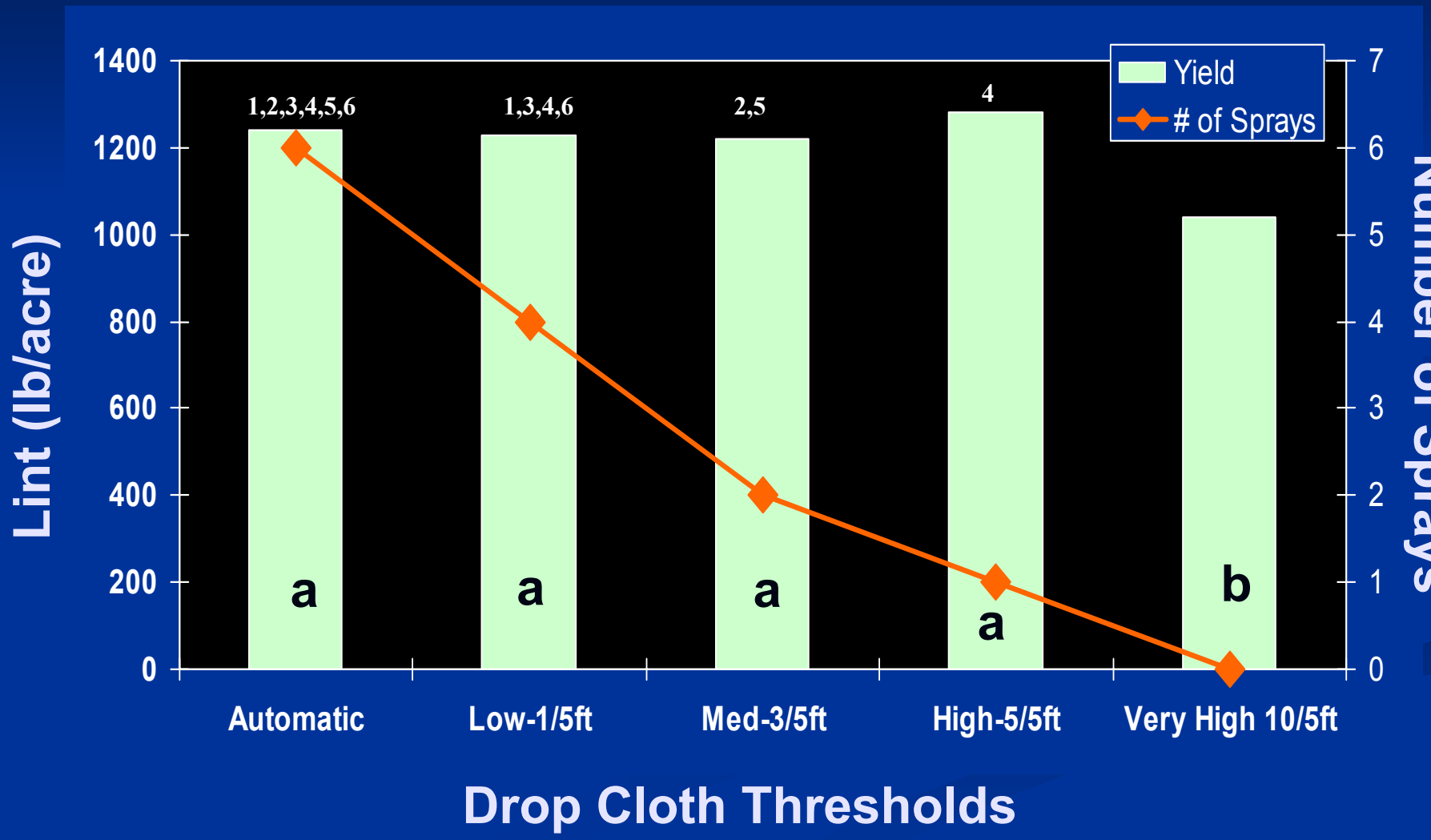
Mid-Season TPB Thresholds
Bagwell - LA, 2006



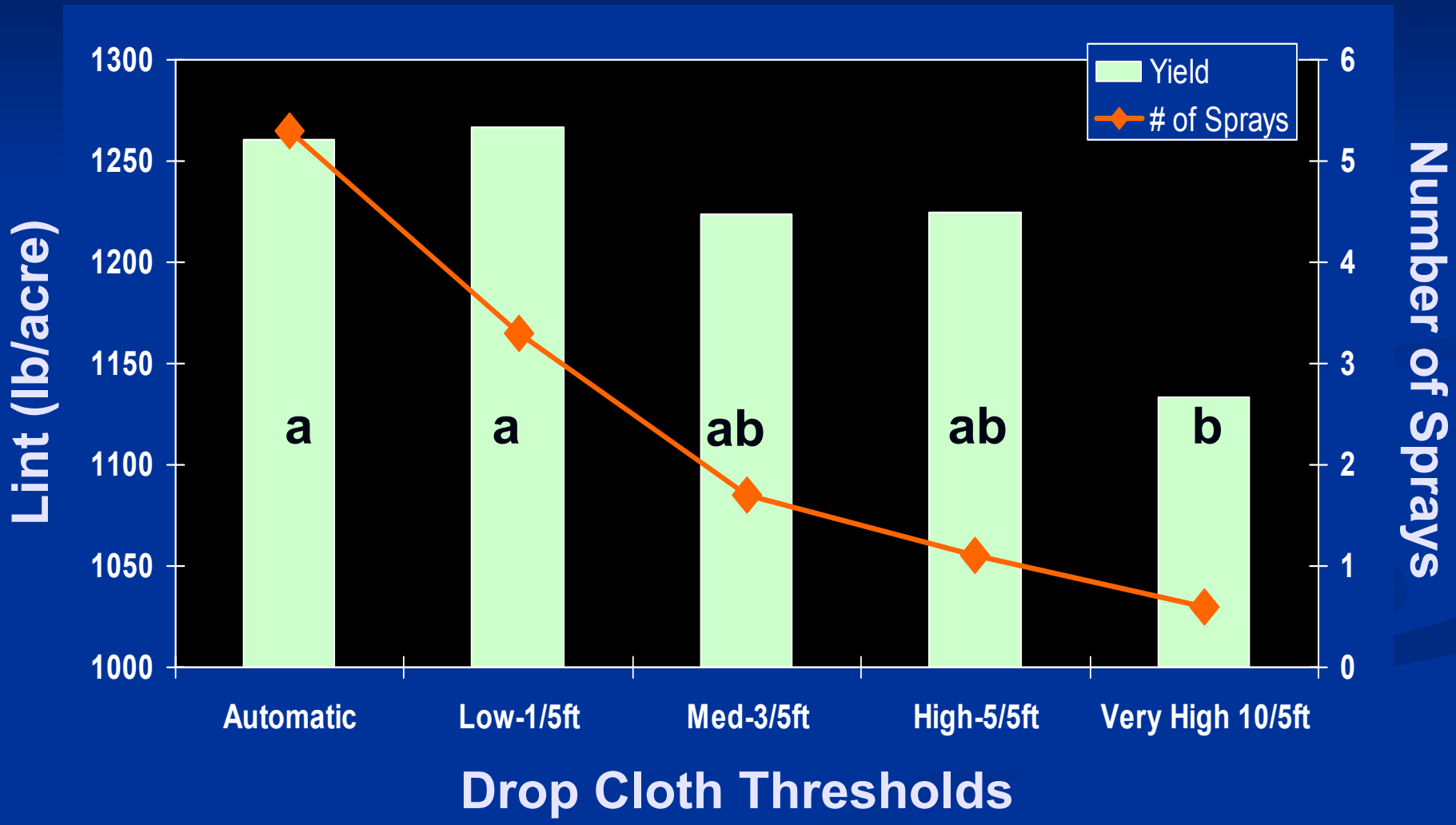
Mid-Season TPB Thresholds
Lorenz - Lee Co. AR, 2006



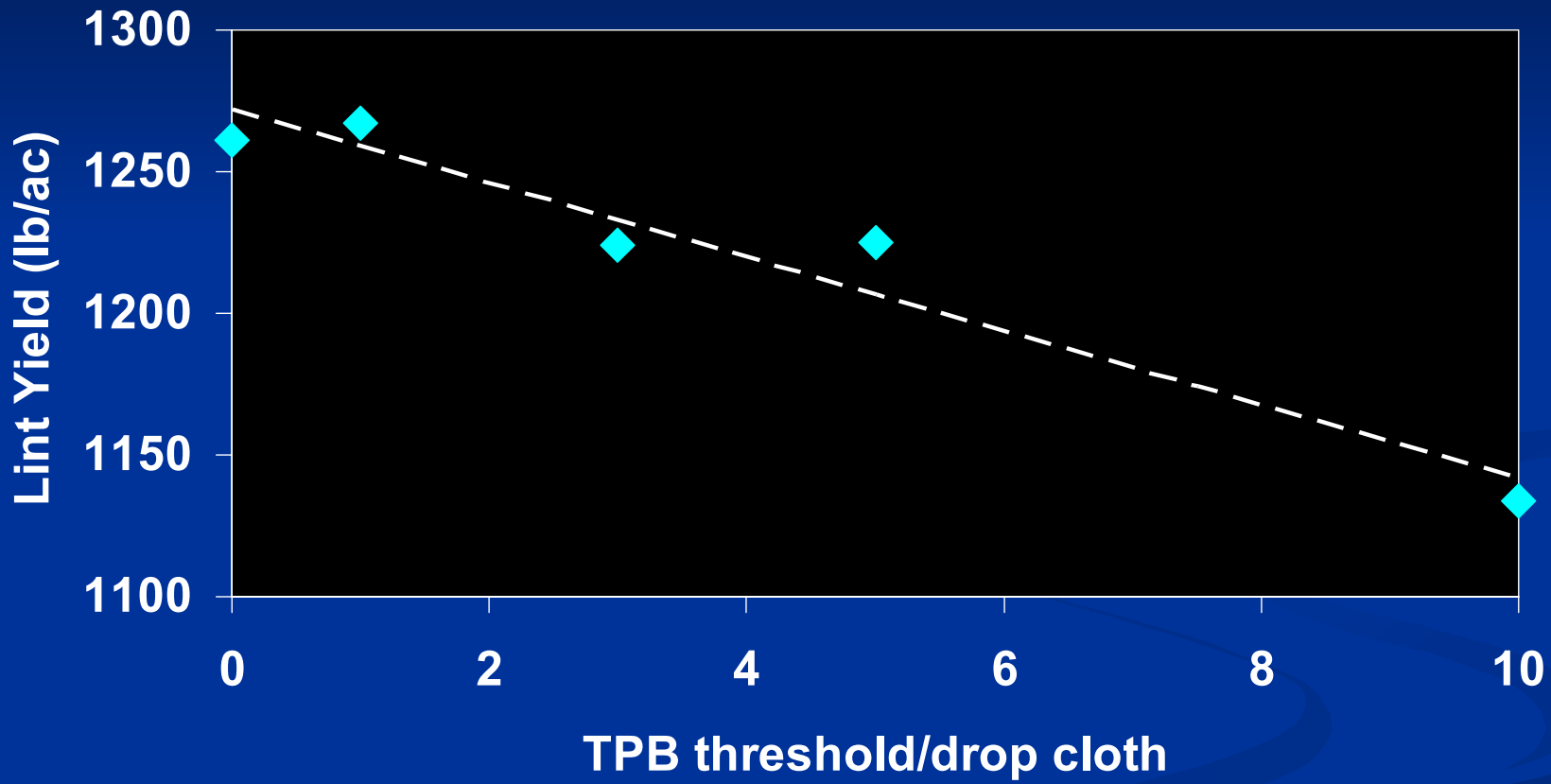
Mid-Season TPB Thresholds
Stewart - Lauderdale, TN, 2006



Mid-Season TPB Thresholds Mid-South (4 locations), 2006 where high threshold reached

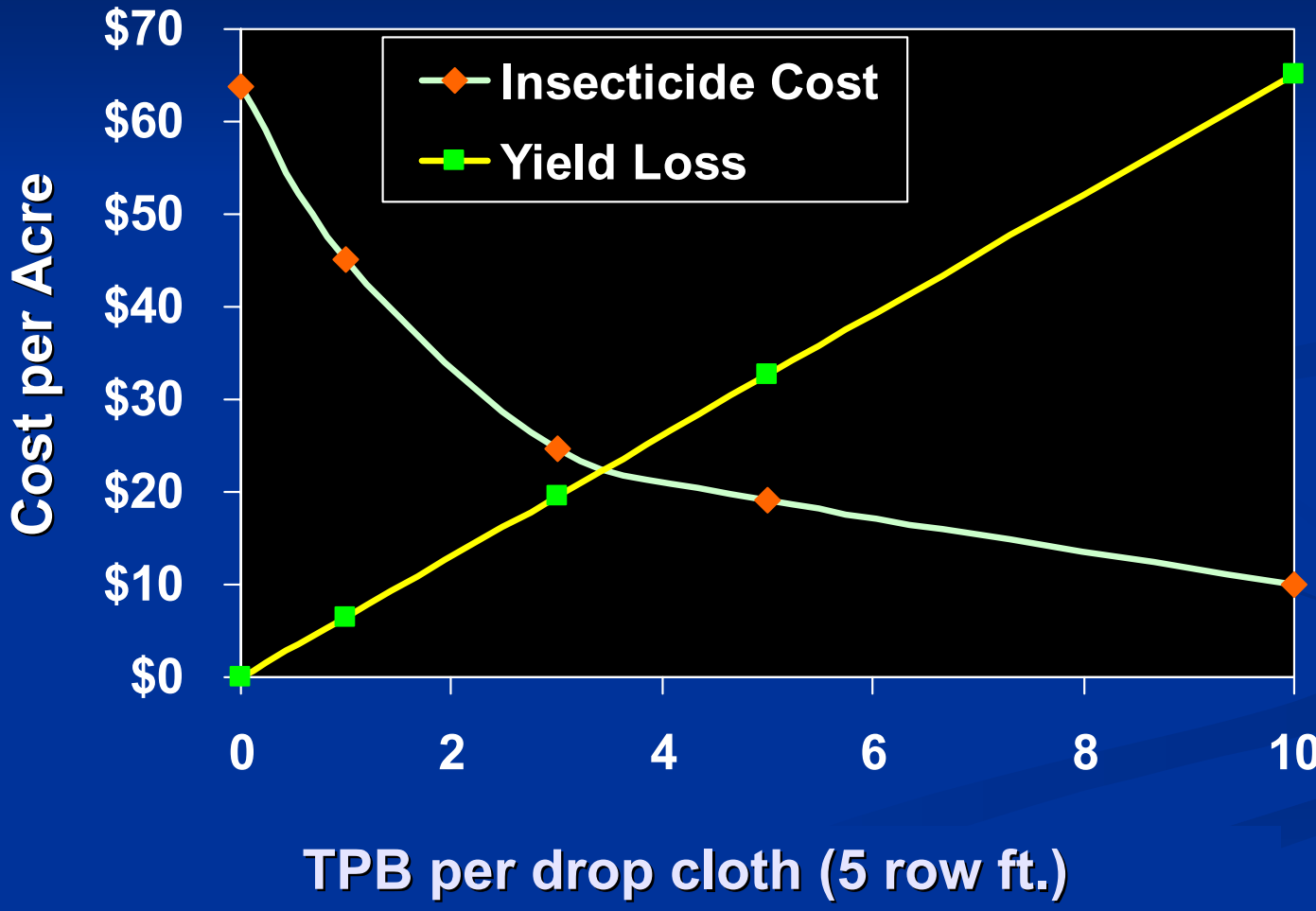


Mid-Season TPB Threshold Summary



Lost 13 lb lint per acre for each 1 TPB /5 row ft. increase in threshold

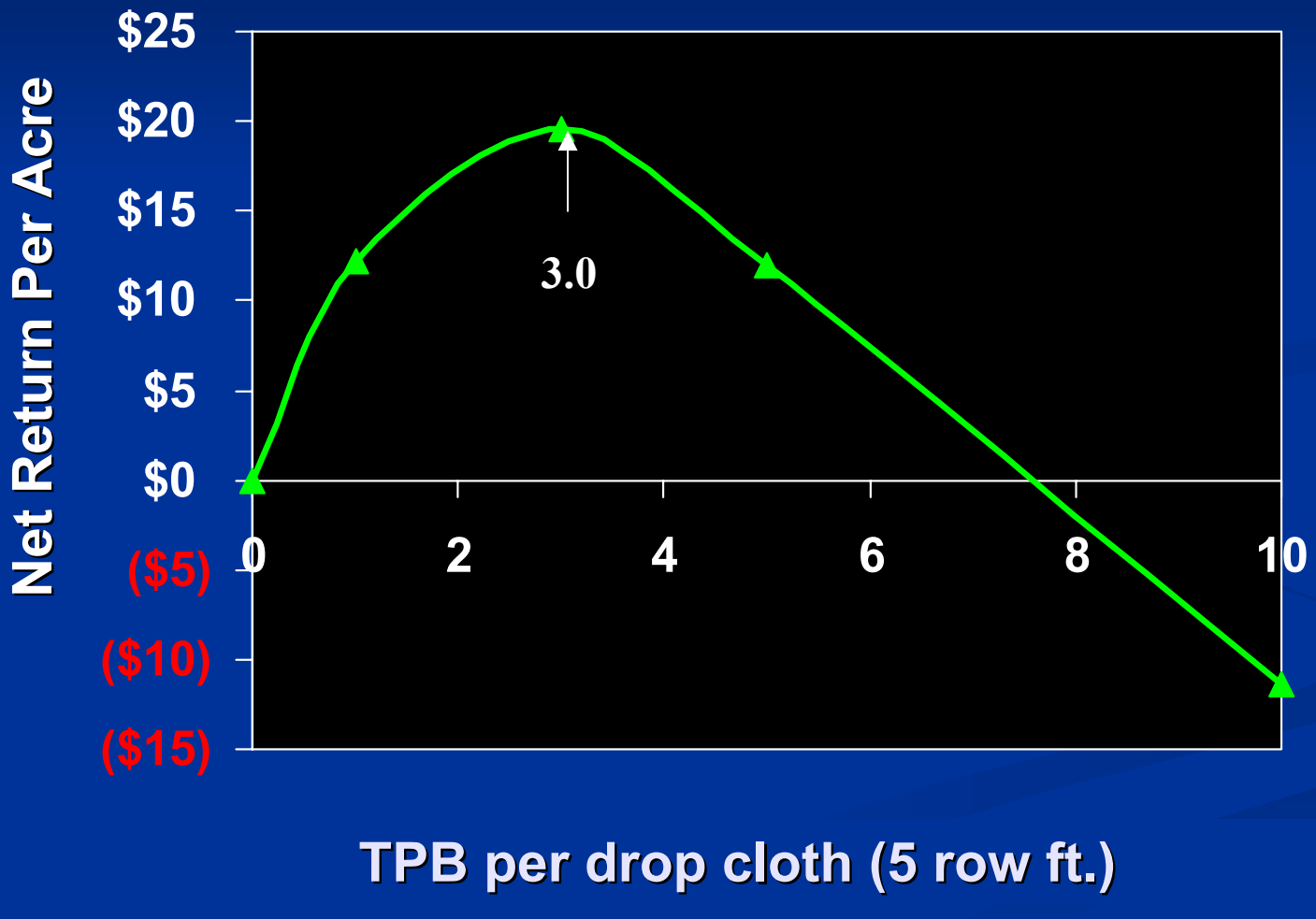
Mid-Season TPB Threshold Current Economics



insecticide = $10/application

cotton value = $0.50/lb

Mid-Season TPB Threshold Current Economics



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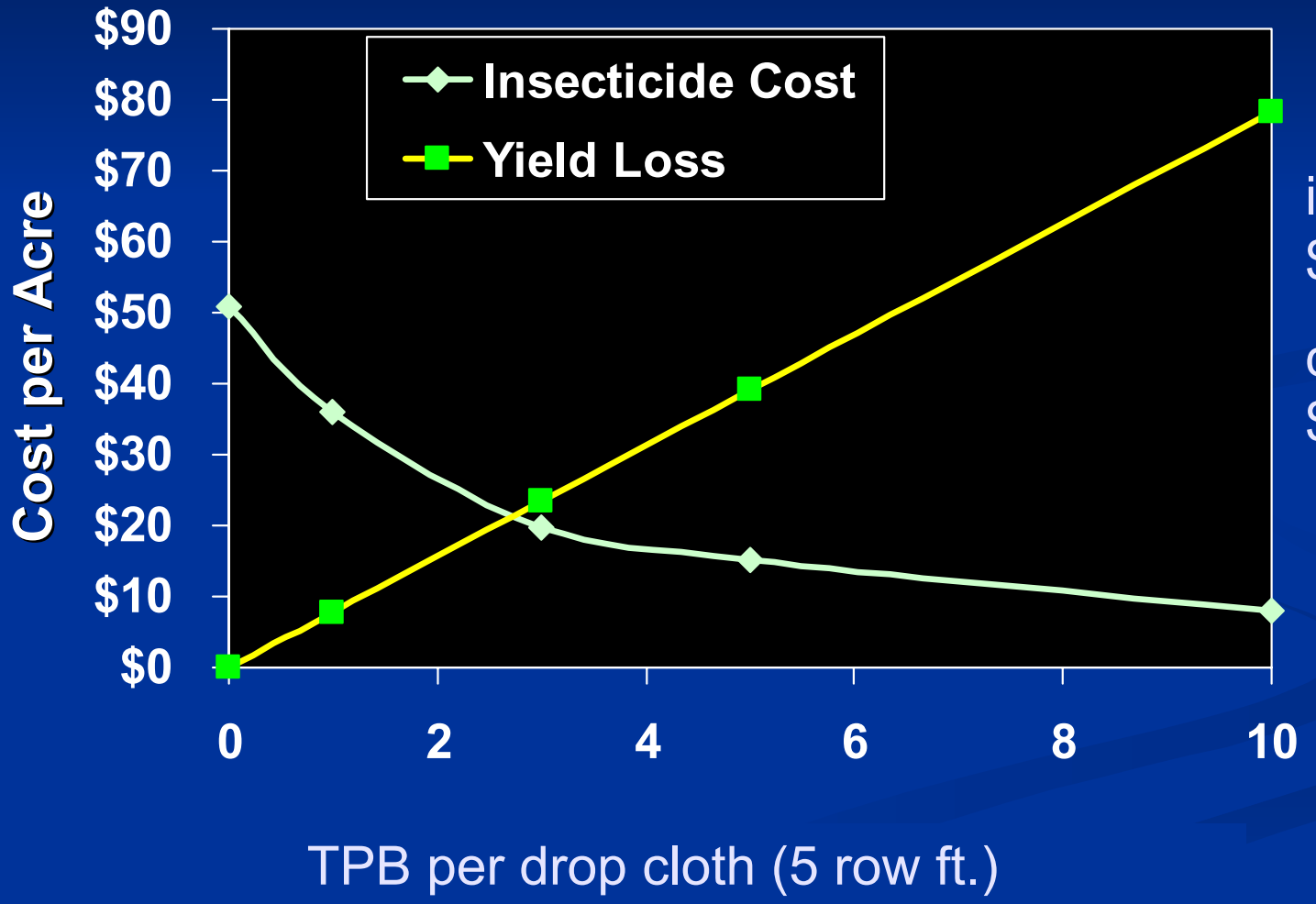
Mid-Season TPB Threshold
Low Cost, High Value Economics

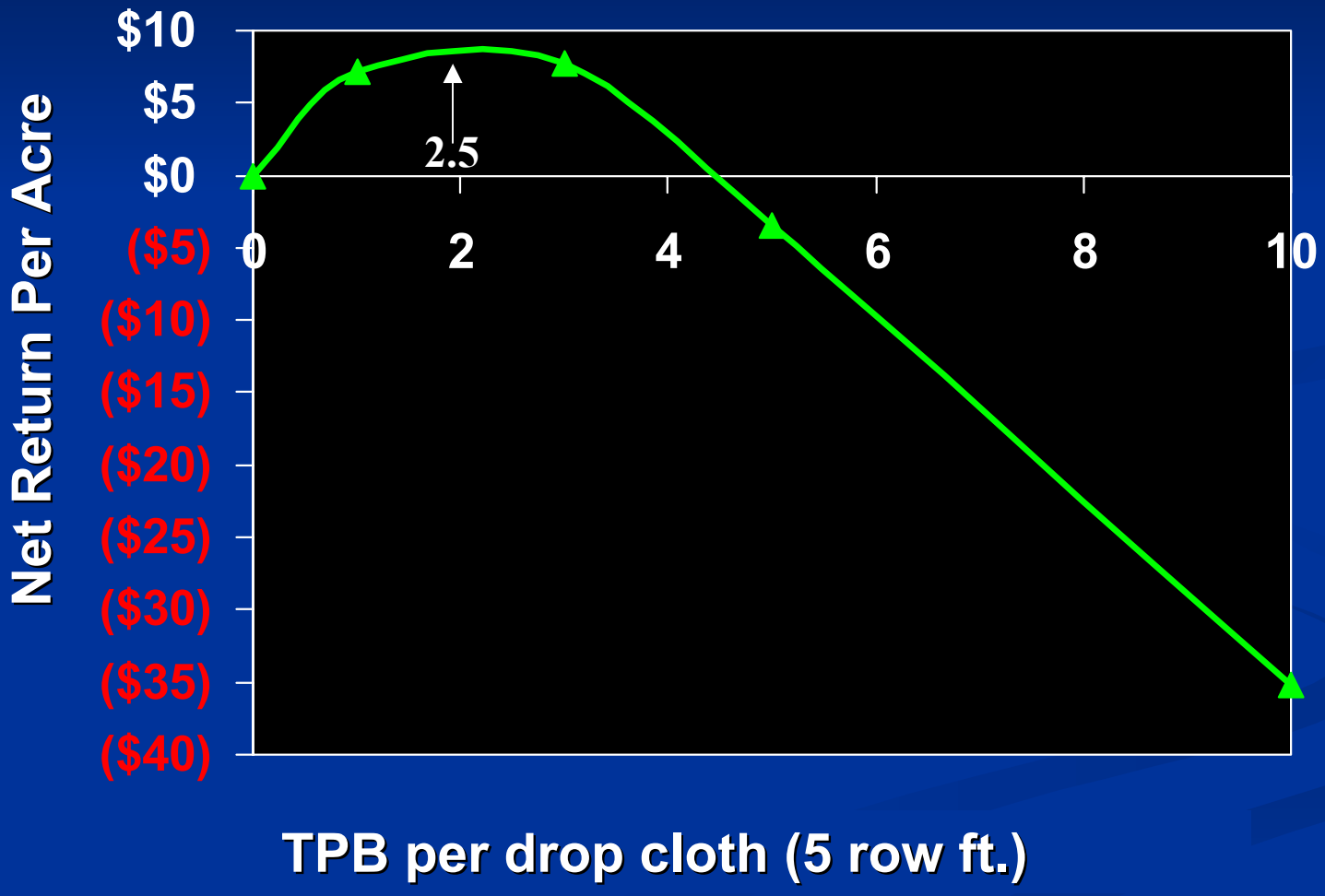


insecticide = $8/application

cotton value = $0.60/lb

Mid-Season TPB Threshold

Low Cost, High Value Economics



insecticide = $8/application

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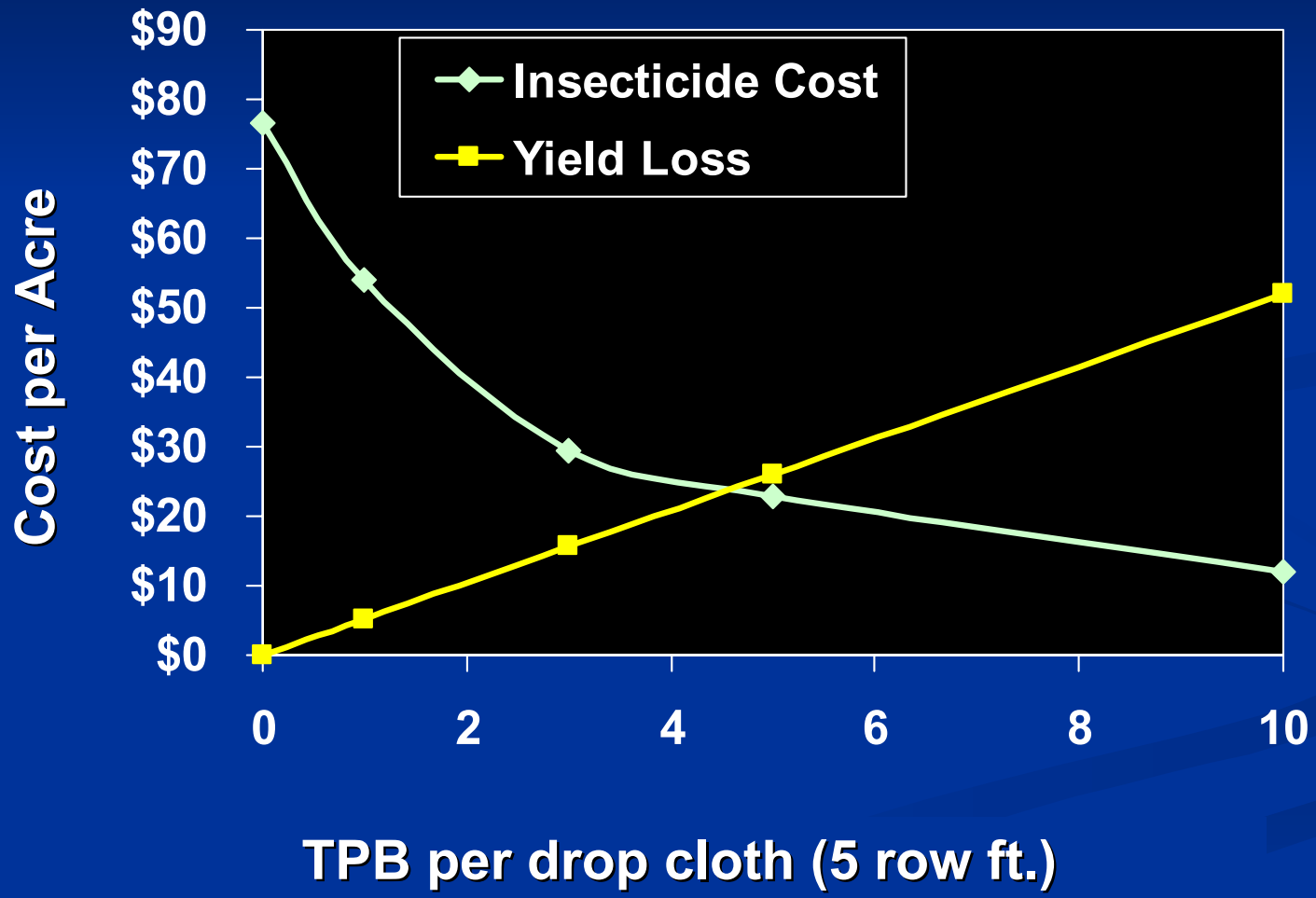
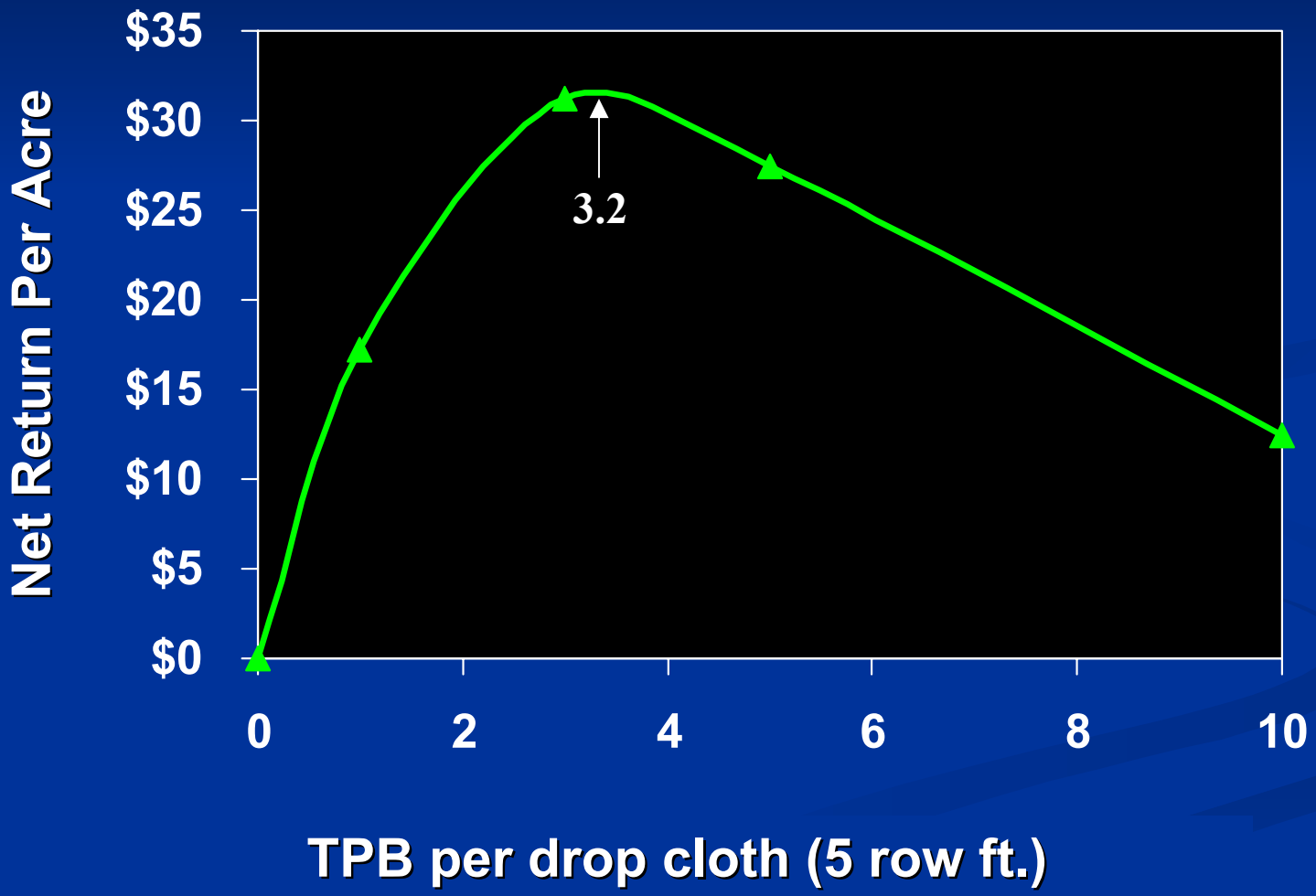
Mid-Season TPB Threshold High Cost, Low Value Economics



insecticide = $12/application

cotton value = $0.40/lb

Mid-Season TPB Threshold High Cost, Low Value Economics



insecticide = $12/application

cotton value = $0.40/lb

Conclusions

- Threshold recommendations are now based on 3 bugs/5 ft.
- Threshold of 10-15% dirty squares, 2.5-3 TPB/5 row ft on a drop cloth or 10-15 TPB/100 sweeps looks to be optimal

Thank You

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