



The Sustainability of Cotton

Brad Godwin

Monsanto Company

Trends Shaping Agriculture Today

Increasing World Population



Over 9
billion
people by
2050

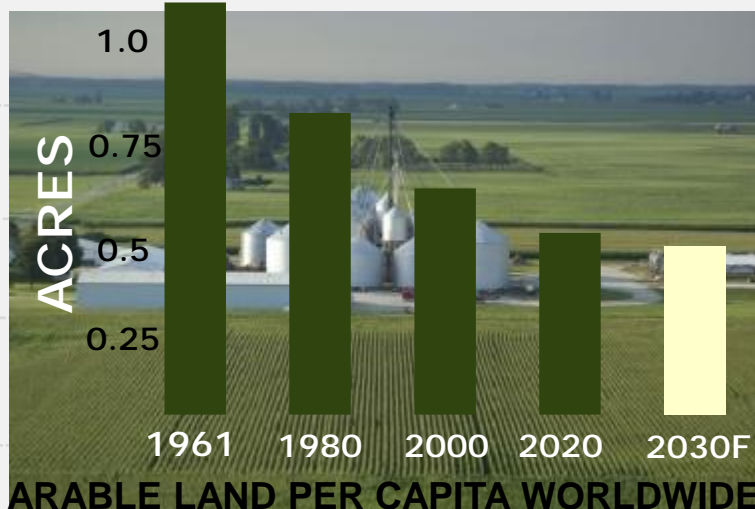
Increasing Protein Demand



Increasing Grain Demand



Shrinking Arable Land



Water availability



A Global Commitment to Sustainable Yield

THREE MAIN GOALS ARE AT THE HEART OF THIS EFFORT

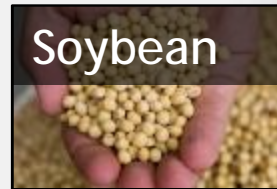


What Does it Mean to Double Yield in the U.S. by 2030?



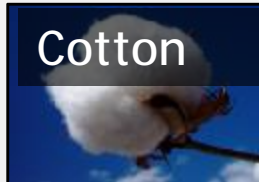
Corn

2000 Baseline: 137 bu/ac
2030 Goal: 300 bu/ac



Soybean

2000 Baseline: 37 bu/ac
2030 Goal: 80 bu/ac



Cotton

2000 Baseline: 632 lbs/ac
2030 Goal: 1,300 lbs/ac

How Are We Going to Reach These Goals?



Breeding

Creates new, more robust varieties that perform better in the field.



Biotech

Adds special beneficial genes to the plant.

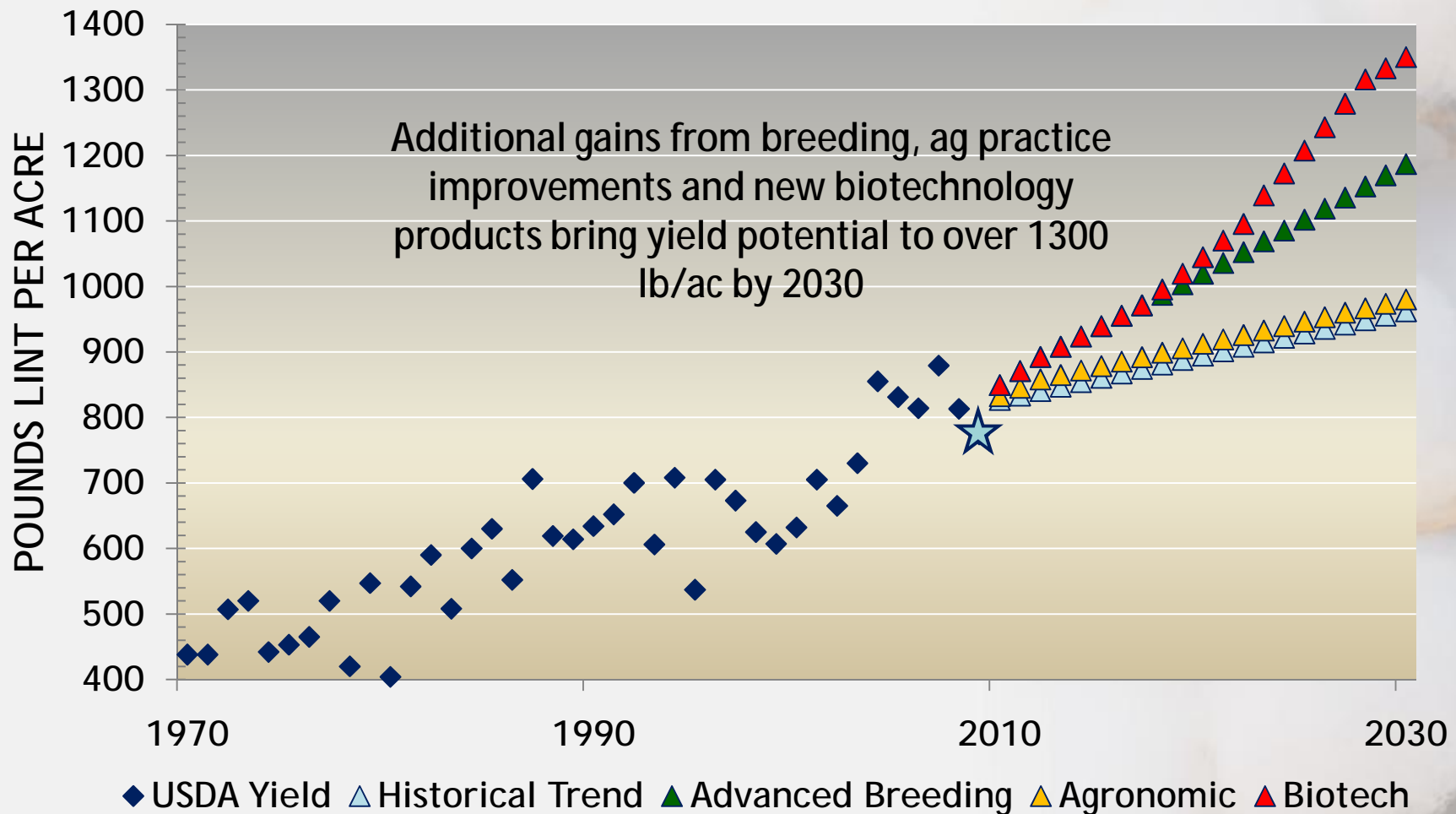


Agronomics

Agronomic practice improvements make acres more productive.

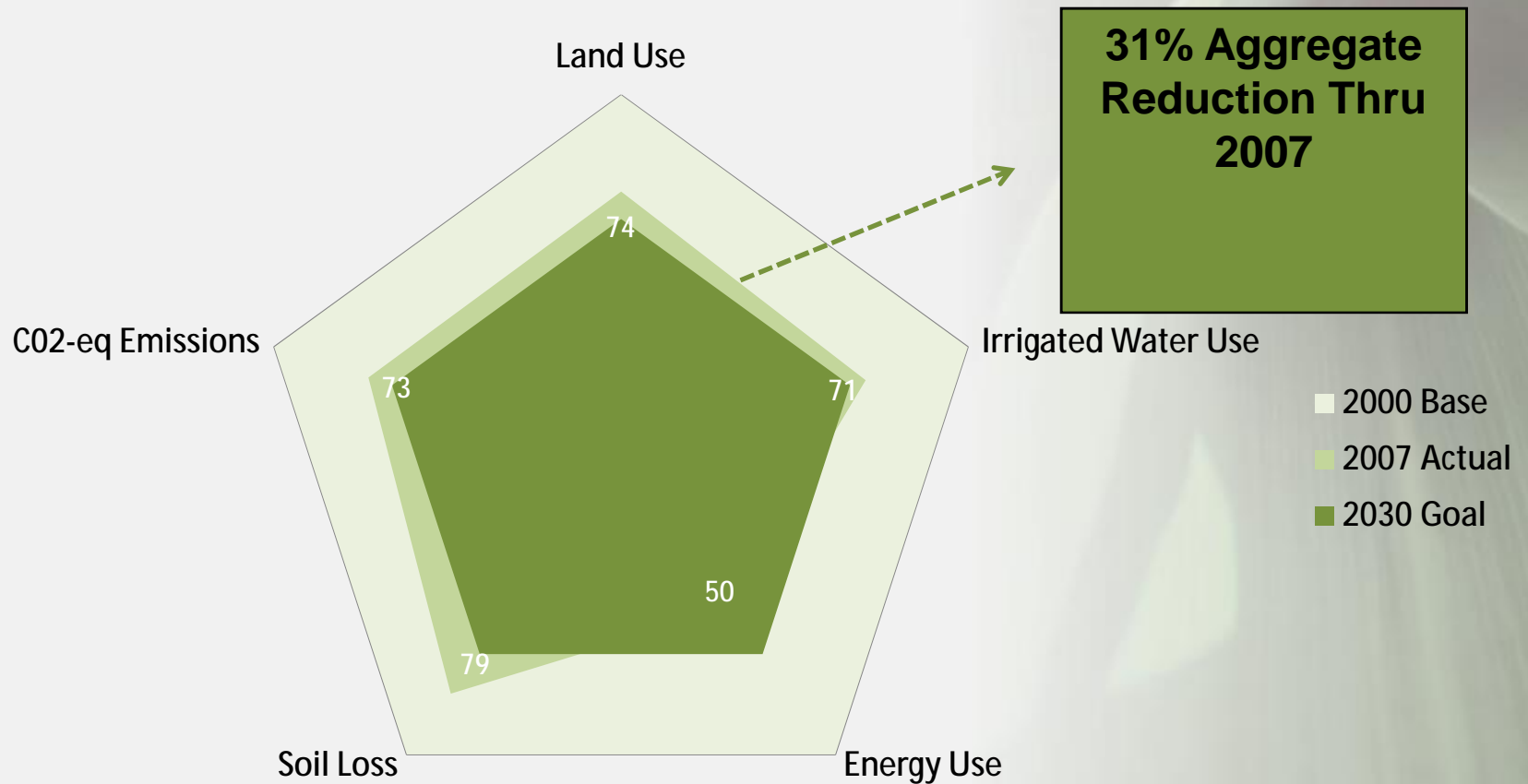
Cotton Yield Components to 2030

COTTON YIELD POTENTIAL TO 2030 IN THE UNITED STATES



Indicator: US Cotton Resource Use Efficiency

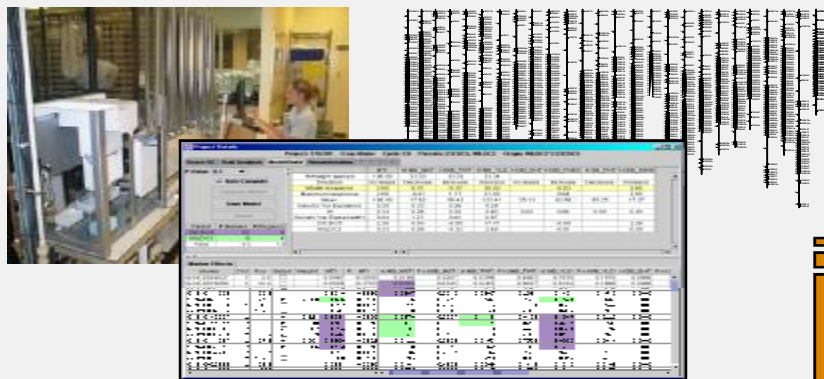
National Average Resources per Unit of Output
Indexed to Year 2000 Actual Values



Source: *Field to Market: Environmental Resource Report Jan 2009*

Unparalleled Investment and Expertise in MAB Unlocks the Potential of D&PL Germplasm and Monsanto Traits

MOLECULAR BREEDING ENGINE



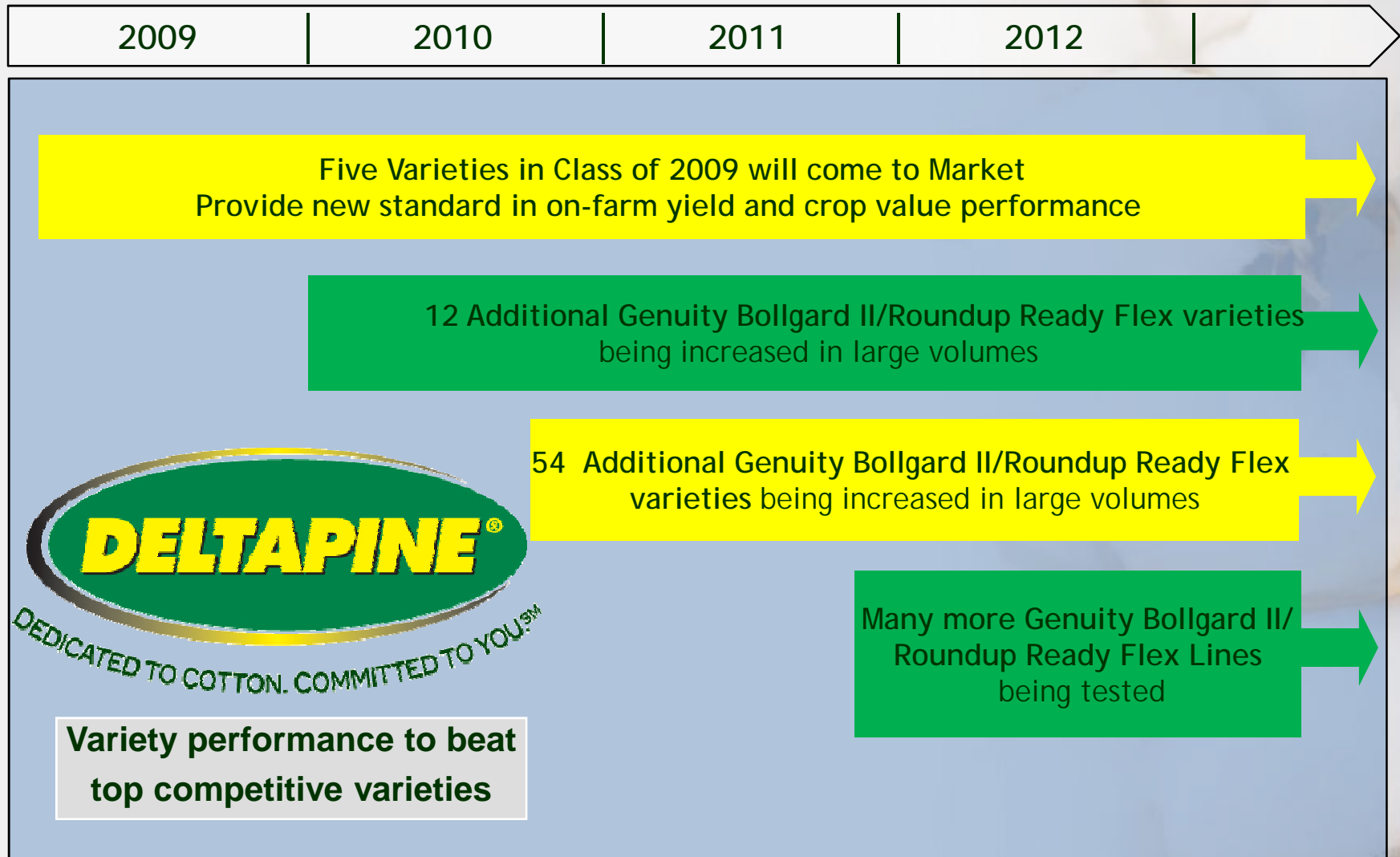
BREEDING CAPABILITIES

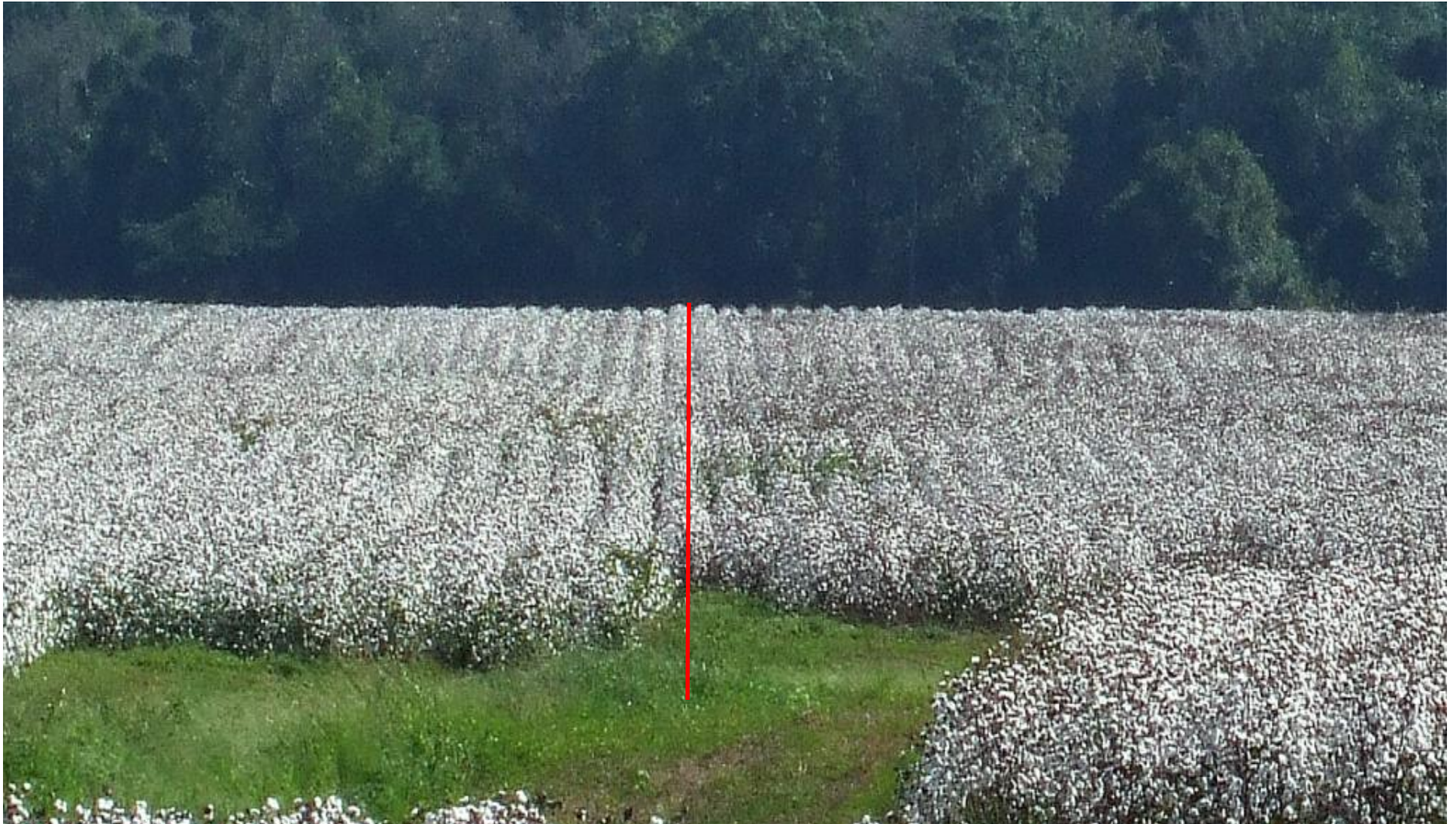


- Monsanto investment in markers is increasing the rate of gain over conventional breeding:
 - >\$100M invested in marker platform that can analyze 10's of millions of samples
 - >100x increase in marker data use only one year after the D&PL acquisition

This capability fuels the creation of top tier germplasm and sets the genetic knowledge base to deliver next-generation biotech traits

Investments in Cotton Breeding are Making a Real Difference in Bringing High Yielding Varieties to Market





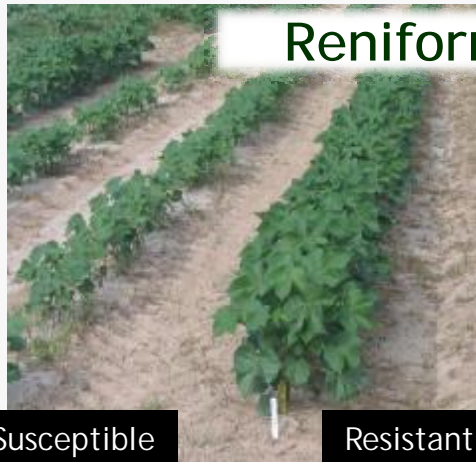
Class of 09
1530 lbs per acre

DP 555
1340 lbs per acre

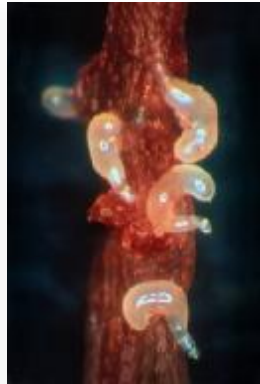
Michael York, Brooks County, GA

We Are Currently Using Breeding to Develop a High Yielding, Nematode Resistant Cotton Family

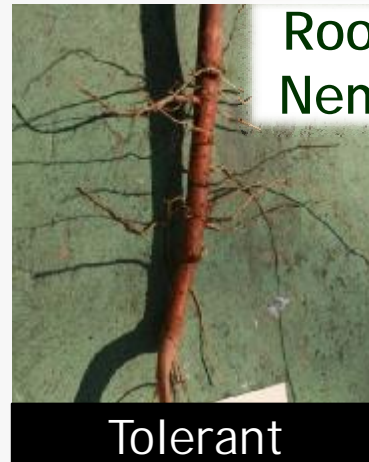
THESE NEMATODES ACCOUNT FOR \$220M IN U.S. YIELD LOSSES ANNUALLY¹



Reniform Nematode



Stephen Rice, NMSU, 2002



Root Knot Nematode



Jack Jones, Louisiana Ag Exp Stn - LSU, 2008

- § Resistant cultivars could potentially increase lint yield by 10-15% under Reniform Nematode and by 8-10% under Root Knot Nematode (RKN) infestations.
- § A high-throughput screening method has been developed that will accelerate introgression of Reniform Nematode resistance into elite germplasm.
- § Introducing multiple QTL's for resistance to RKN into elite germplasm using markers

¹ Blasingame, D. et al. 2008. "Cotton disease loss estimate committee report" in Proc. Beltwide Cotton Conf., Natl. Cotton Council of America

Control Of Lygus On Cotton

PROTECTING BOLLS AND IMPROVING OVERALL PLANT HEALTH AND YIELD



**Insecticidal protein leads
have been identified**



Cotton plant assays in progress

Discovery

Phase 1
Proof of Concept

Phase 2
Early Development

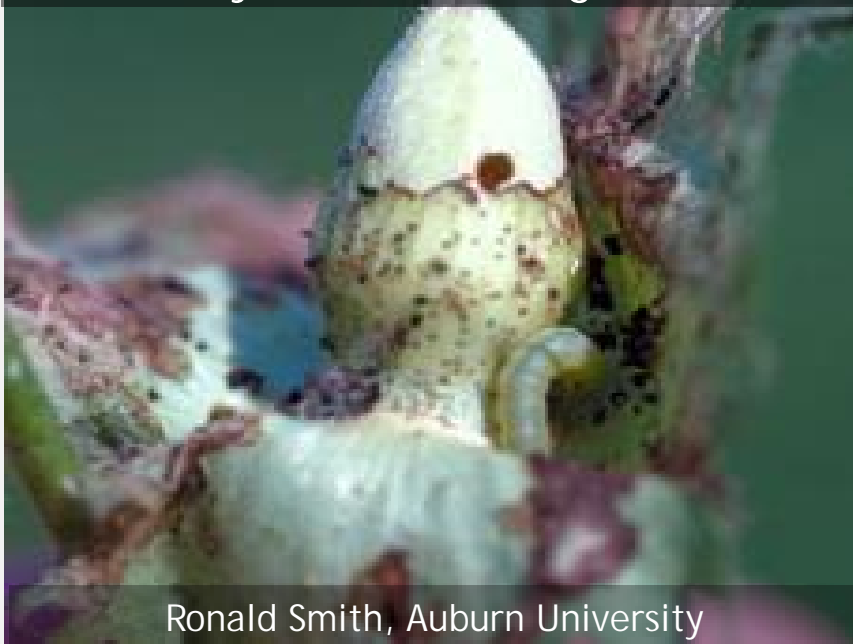
Phase 3
Adv. Development

Phase 4
Pre-Launch

Launch

Bollgard III Provides Improved Control of Beet & Fall Armyworms

Beet Armyworm Feeding on Cotton



Fall Armyworm Feeding on Cotton



Third-generation of insect control in Bollgard III cotton ensures improved control by incorporating a new *Bt* protein



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Drought-Tolerant Cotton Showing Promise in Field Testing

DROUGHT-TOLERANT COTTON

COLLABORATION
WITH



- Drought leads advancing to greenhouse screens
- First leads in field testing are showing promise
- *Up next*: Continued evaluation to assess drought performance



TESTING MULTIPLE GENES FOR IN-FIELD PROOF OF CONCEPT

Discovery

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Proof of Concept

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Dicamba- and Glufosinate- Tolerant Cotton Expand Weed Control Options

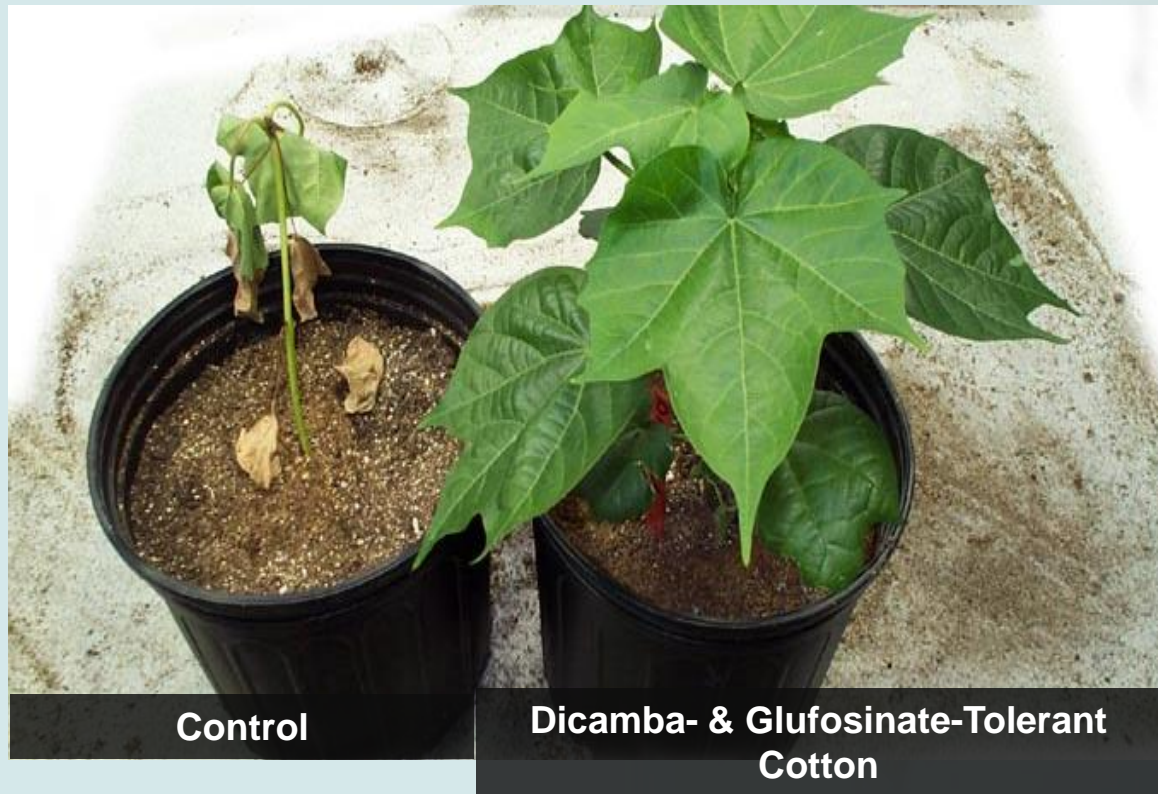
TESTS SHOWING EXCELLENT TOLERANCE TO ALL THREE HERBICIDES

Product would represent Monsanto's first three-way stack of herbicide-tolerant technologies including:

§Roundup Ready Flex

§Dicamba-tolerance

§Glufosinate tolerance



There are only four known weed species resistant to dicamba in 40 years of use, and no known cases of weeds developing glufosinate resistance.

Discovery

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Maximizing Performance Potential with Acceleron™ Seed Treatment System in Cotton

INCREASE PLANT VIGOR, UNIFORMITY, AND HIGHER YIELD POTENTIAL

Plan to Be Launched with all Deltapine varieties in 2011

New Treatment Contains:

- Fungicides
- Plant Health Agents
- Insecticides
- Nematicides



Initial Field Results Demonstrate:

- Increase of 50-60 lbs Lint/A (over premium seed treatment package)
- Plant vigor and uniformity
- Consistent early season insect protection under extreme pressure

**Monsanto Cotton Seed Treatment Trial
Leland, MS**



Untreated Cotton

Monsanto Experimental
Seed Treatment



Thank You

