Creating Sustainable Outcomes for Agriculture

IPC Fall 2007 Seminar

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THE Keystone CENTER

Steering Committee Members and Participants

- American Soybean Association
- Bunge Limited
- Cargill, Incorporated
- The Coca-Cola Company
- Conservation International
- DuPont
- General Mills Inc.
- Grocery Manufacturers Association/Food Products Association
- The Heinz Center
- McDonald's
- Mars, Inc.
- Monsanto
- National Corn Growers Association
- National Cotton Council
- The Nature Conservancy
- United Soybean Board
- Wal-Mart Stores, Inc.
- World Wildlife Fund

The broad conversation on sustainability has matured in many sectors

Common sense and technology are teaming up to create practical solutions

The Challenge Ahead

Demand

Environment

Technology can play a big role

Farmer

Health

There are opportunities to better define sustainability in agriculture – the global picture

Key environmental impacts of global agriculture:

- 55% of habitable land and growing
- 70% of human use of water, >60% wasted
- 70-90% of farmers lose more carbon/year than put back
- Highest industry use of chemicals
- More environmental impact, including pollution, than any other human activity
- Climate change — 25+% of greenhouse gases that contribute to climate change

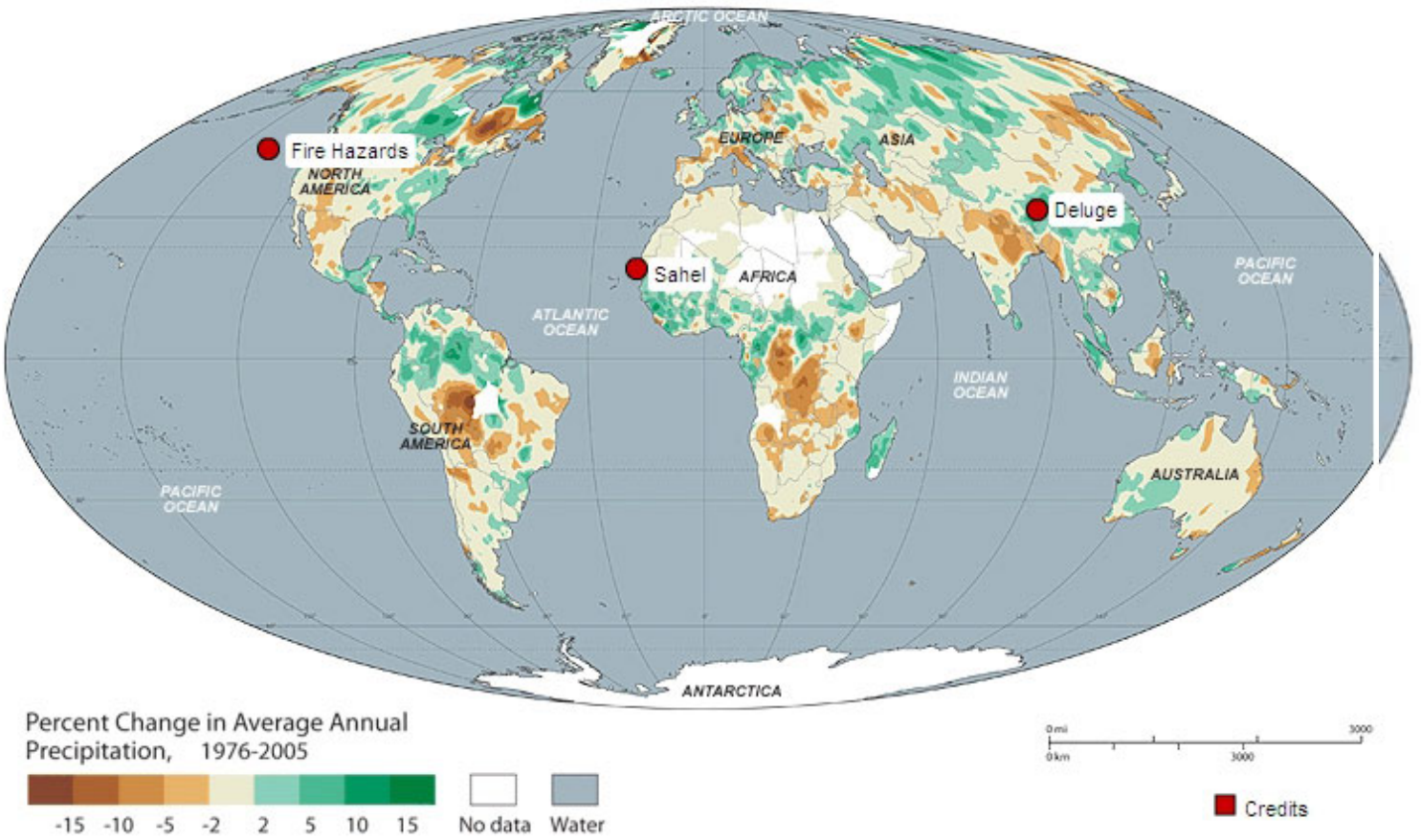
And some key realities:

- Global food demand will double in 50 years
- Increased income (globally 2.4 times by 2050) will lead to increased consumption
- Per capita arable land globally is decreasing
- Renewables and biofuels are also a part of overall demand for agricultural production
- The poorest people on the planet have no land and can spend 75% of income on food and still go hungry
- Better production systems exist for virtually all crops, but they are often disseminated too slowly

Source: World Wildlife Fund - US

Global Precipitation At A Glance

(From National Geographic)



Source: National Geographic Oct. 2007

Our working definition of sustainable agriculture

Sustainable agriculture will meet the needs of the present while improving the ability of future generations to meet their own needs by:

- Increasing productivity to meet future nutritional and fiber needs while decreasing impacts on the environment. Improving human health through access to safe, nutritious food
- Improving the social and economic well being of agricultural communities

Premise: We can shift the discussion on sustainability in agriculture

- We can:
  - Focus on outcomes and results and allow producers to find the best way to achieve results through a full range of agricultural technology choices
  - Apply information at the grower level in support of larger, overarching goal of shifting the entire sustainability curve
  - Drive change where the opportunity is greatest – throughout large area “conventional” agriculture
  - Eventually, create pull through the production system all the way to the consumer via partner companies
  - Use peer-reviewed science to identify goals and measure impacts, progress, and results

Initial key impact areas for environmentally sustainable agriculture *(Focus on Large Area Crops)*

Impact Area	Examples
Soil 	Soil erosion, soil carbon, ground cover
Water 	Water use, water effluent quality
Habitat 	Biodiversity, on-farm habitat, acres converted

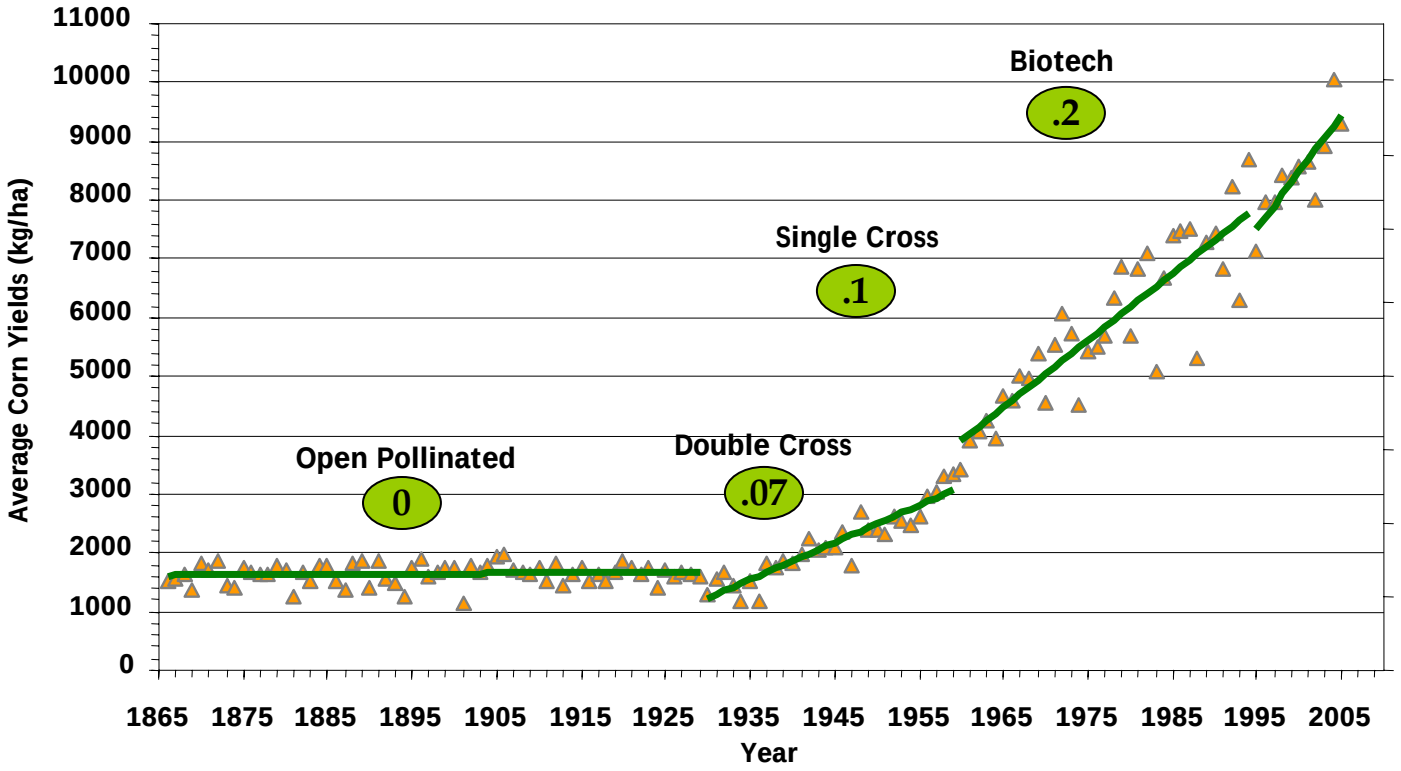
What can be measured?

- Work in Progress: Possible ideas :

- Farmer Input: (Nitrogen usage, tillage, yields, green stripes, on farm wild habitat/biodiversity
- Remote Sensing: (crop residue, soil disturbance, water flow and practices to prevent flow into streams, crop stress
- Continue other landscape Measurements (water quality etc.)
- **Broad Results such as reducing input per unit produced of: N, Soil Loss, Land used, Water added, etc., and added farmer viability**

Breeding better seeds delivers results

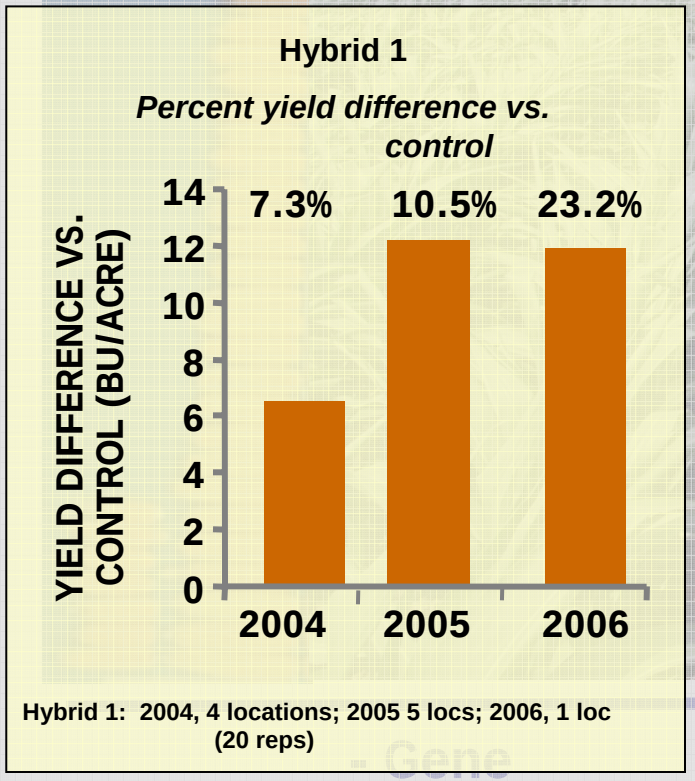
- **Actual Breeding Plus Cultural Practice Gain:**
- **Corn Yields Continue to Advance in U.S., Tremendous Gains Made Last Ten Years**

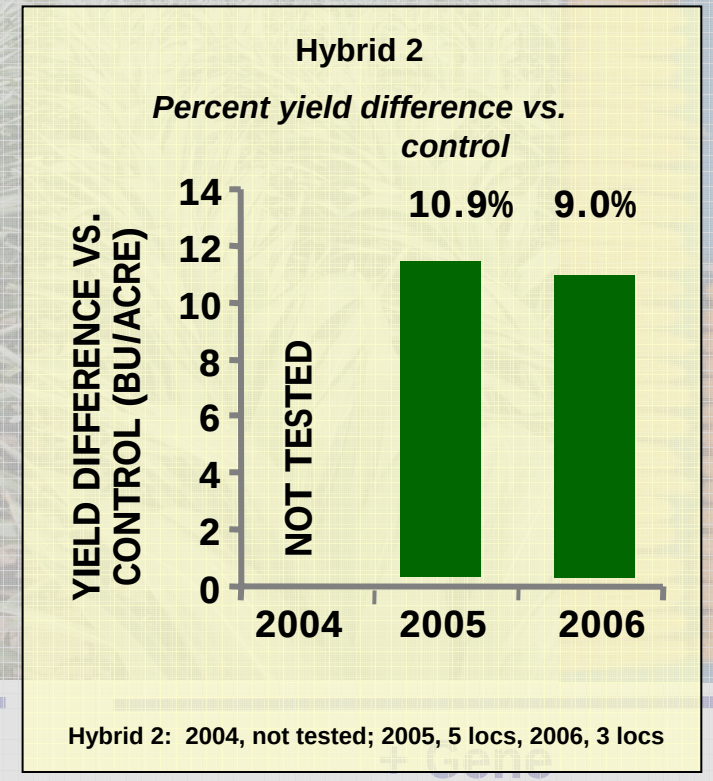


Source: March 2006. Crop Science. Ref# 46:528-543

= Average annual gain MT/Hectare

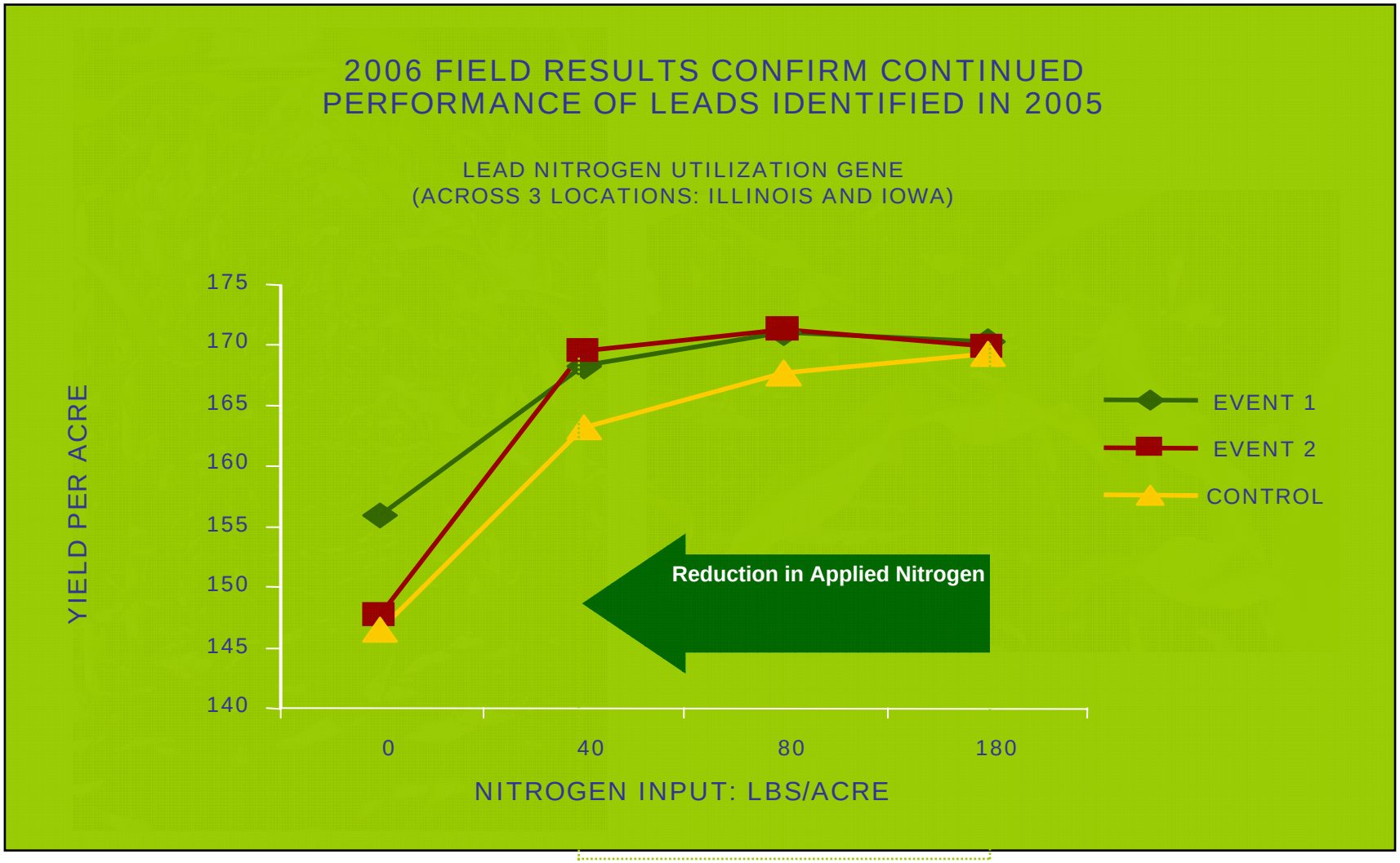
Working On Higher and More Stable Yields In Rainfed Settings





Source: Monsanto field trial research, 2006.

Producing Higher Yields With Fewer Inputs Including Nitrogen



Source: Monsanto field trial research, 2006.

The Challenge Ahead