Creating Sustainable Outcomes for Agriculture

IPC Fall 2007 Seminar

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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

Technology can play a big role

Demand
Environment
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

Global Precipitation At A Glance
(From National Geographic)

Source: National Geographic Oct. 2007
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)**

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>Soil erosion, soil carbon, ground cover</td>
</tr>
<tr>
<td>Water</td>
<td>Water use, water effluent quality</td>
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<tr>
<td>Habitat</td>
<td>Biodiversity, on-farm habitat, acres converted</td>
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</tbody>
</table>
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

![Graph showing average corn yields over time with different breeding methods.](image)


= 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

2006 FIELD RESULTS CONFIRM CONTINUED PERFORMANCE OF LEADS IDENTIFIED IN 2005

LEAD NITROGEN UTILIZATION GENE
(ACROSS 3 LOCATIONS: ILLINOIS AND IOWA)

Source: Monsanto field trial research, 2006.
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