Sustainability: What does it mean for Agriculture?

Dialogue on Agriculture
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Jean-Michel Duhamel
General Manager
South Europe, Middle East & North Africa
Monsanto Company
Overview

The right choice: produce more in a sustainable way
Some technologies to help answering the challenge
Including the developing countries: the example of « WEMA » project in Africa
It is an imperative to find and develop technologies to help answering the challenge of a Sustainable Agriculture. Produce with more judicious use of limited natural resources. While improving the lives of the world’s farmers. Increase production to meet needs of a growing population. Meet the needs of the present while improving the ability of future generations to meet their own needs.
A globally sustainable agriculture

Increase production to meet needs of a growing population.

Double food production by 2050 to feed a world of 9 billion people.
A growing demand has started

CHINA'S GROWING SOYBEAN DEMAND:
DOMESTIC PRODUCTION AND IMPORTS

In 2008, forecasts are for China to import >33MMT of soybeans

1. ProExporter

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>5,000</td>
<td>15,000</td>
</tr>
<tr>
<td>2001</td>
<td>10,000</td>
<td>20,000</td>
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<tr>
<td>2002</td>
<td>20,000</td>
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<td>2003</td>
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<td>2007</td>
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<td>2008F</td>
<td>80,000</td>
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<td>2009F</td>
<td>90,000</td>
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A globally sustainable agriculture

Produce with more judicious use of limited natural resources.

Conserve water, land and energy
Water Usage and Agriculture

The Challenge

• Agriculture is responsible for 70% of freshwater withdrawal.

• By 2025, Developing Countries will have ~ 300 Million MT grain deficits due to water scarcity.
Help farmers become more environmentally and economically sustainable while improving the lives of the world's farmers.
Improved Livelihood for Farmers

- >15,000 farmers growing Bt maize in the Philippines
- Yield advantage: ~30%
- Production cost reduction ~20%
- Income increased by 20%

**Yield Comparison**

<table>
<thead>
<tr>
<th>Hybrid 1</th>
<th>Hybrid 2</th>
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<tbody>
<tr>
<td>6.3 T/ha</td>
<td>8.0 T/ha</td>
</tr>
<tr>
<td>27%</td>
<td>5.7 T/ha</td>
</tr>
<tr>
<td>Conventional</td>
<td>Bt Corn</td>
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**Conventional Corn** | **Bt Corn**
Better seed delivers results while reducing the environmental footprint

- Actual Breeding Plus Cultural Practice Gain:
- Corn Yields Continue to Advance, Tremendous Gains Made Over Last Ten Years

Water use efficiency technologies under advanced development

FIELD TRIALS in the US – 2007

CONTROL HYBRID
(76 BU/AC)

WITH GENE
(94 BU/AC)

Source: Monsanto field trial research.
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.
Goal: To increase yield stability and reduce risk under drought conditions

- Increase yields 25% in ten years (MAB + biotech)
- Enable use of hybrids and fertilizer
- Enable crop diversification
WEMA Partners Working with the NARS (National Ag Research Services)

- **Monsanto**: World leader in MAB, gene discovery, trait development and trait licensing
- **CIMMYT**: World leader for breeding maize for African agro-ecological zones
- **WEMA**: Unique African institution mandated to access and deliver proprietary technologies to African farmers
- **AATF**: World leader for breeding maize for African agro-ecological zones

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Monsanto Contribution to Deliver WEMA

GERMPLASM

Start with specifically chosen germplasm for Africa...

ADVANCED BREEDING

...then using advanced breeding, selecting directly for beneficial drought tolerance characteristics in germplasm with genetic markers...

BIOTECHNOLOGY

...then enhance improved germplasm with biotech.

ALL THREE WORK TOGETHER TO MAXIMIZE YIELD UNDER STRESS
Value sharing is a critical element of technology adoption in each world area.

**Incremental Value**

- **Tangible & Intangible**

**Current Value**

- **Current Cost**
- **Replacement Cost**
- **Value of new solution**
- **Price of new solution**

Current available technology

Value of new solution

Price of new solution

50-70% to Growers

50-30% to the chain
Thank You