James E. Byrum
Michigan Agriculture, Part of the Water Quality Solution!
<table>
<thead>
<tr>
<th></th>
<th>Acres Harvested</th>
<th>Yield(^1)</th>
<th>Production(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>1,730,000</td>
<td>81</td>
<td>140,130,000</td>
</tr>
<tr>
<td>2013</td>
<td>2,650,000</td>
<td>156</td>
<td>413,400,000</td>
</tr>
<tr>
<td><strong>Soybeans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>515,000</td>
<td>26</td>
<td>13,390,000</td>
</tr>
<tr>
<td>2013</td>
<td>1,900,000</td>
<td>44</td>
<td>83,600,000</td>
</tr>
<tr>
<td><strong>Wheat</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>495,000</td>
<td>39</td>
<td>19,305,000</td>
</tr>
<tr>
<td>2013</td>
<td>630,000</td>
<td>70</td>
<td>44,100,000</td>
</tr>
<tr>
<td><strong>Total Bushels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>2,740,000</td>
<td></td>
<td>172,825,000</td>
</tr>
<tr>
<td>2013</td>
<td>5,180,000</td>
<td></td>
<td>541,100,000</td>
</tr>
</tbody>
</table>
## DEMAND

### WORLD POPULATION

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>2.5 Billion</td>
</tr>
<tr>
<td>2011</td>
<td>7.0 Billion</td>
</tr>
<tr>
<td>2050</td>
<td>9.2 Billion</td>
</tr>
</tbody>
</table>

Source: United Nations
2020

350 Million
More Middle Class Households World Wide

49% of Developing Nations Population

Source: USDA
Changing Diets in Taiwan, 1975 - 1995

Per Capita Annual Food Consumption (kg)

Sources: Taiwan Council of Agriculture, China Statistical Yearbook and Nomura Global Economics
Global Demand For Crops Projected to Grow Dramatically

Source: The United Nations Food and Agriculture Organization
Acres of Total Cropland as Percent of Land in Farms Acreage: 2007

Map showing the distribution of cropland as a percentage of land in farms across the United States. The map is color-coded with the following legend:

- Less than 10
- 10 - 19
- 20 - 39
- 40 - 59
- 60 - 79
- 80 or more

The United States has a total of 44.1 percent cropland.
<table>
<thead>
<tr>
<th></th>
<th><strong>Acres</strong></th>
<th><strong>Yield</strong>&lt;sup&gt;1&lt;/sup&gt;</th>
<th><strong>Production</strong>&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>2,650,000</td>
<td>156</td>
<td>413,400,000</td>
</tr>
<tr>
<td>2025</td>
<td>2,662,000</td>
<td>250</td>
<td>666,500,000</td>
</tr>
<tr>
<td><strong>Soybeans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>1,900,000</td>
<td>44</td>
<td>83,600,000</td>
</tr>
<tr>
<td>2025</td>
<td>2,282,500</td>
<td>65</td>
<td>148,362,500</td>
</tr>
<tr>
<td><strong>Wheat</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>630,000</td>
<td>70</td>
<td>44,100,000</td>
</tr>
<tr>
<td>2025</td>
<td>555,500</td>
<td>110</td>
<td>61,105,000</td>
</tr>
<tr>
<td><strong>Total Bushels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>5,180,000</td>
<td></td>
<td>541,100,000</td>
</tr>
<tr>
<td>2025</td>
<td>5,500,000</td>
<td></td>
<td>874,967,500</td>
</tr>
</tbody>
</table>

<sup>1</sup> bushels/acre  <sup>2</sup> bushels
FUTURE

WATER
QUALITY
PRODUCTION

• Site Specific Fertilizer Application
• Risk Management
  o Irrigation
  o Drainage
• Economics
PRODUCTION

- Certified Crop Advisers
- Nutrient Management
  - 4R
- Conservation Practices
CLIMATE CHANGE
FARM BILL
REGIONAL CONSERVATION PARTNERSHIP PROGRAM (RCPP)
Importance of the Saginaw Bay

• Largest watershed in Michigan
• 8,700 square miles – including portions of 22 Michigan counties
• 15 percent of Michigan’s total land area
• Key production area for wheat, corn, soybeans, dry beans and sugar beets
• Intensive agricultural land use has shown a need for water conservation activities
• Emphasize non-traditional partnerships that reach across agriculture, food, resource conservation, higher education and other groups.

• Expand conservation practices in new and innovative ways.

• Achieve measureable water quality results in the Saginaw Bay Watershed.
Geographic Areas and Practices

Start with **proven practices** in areas that we can track today.

- Identify top priority conservation practices and concentrate them in “Tier 1” targeted areas.
- The partnership will measure progress by tracking biological health – specifically, fish populations.
- The Nature Conservancy is ready to do so in several “Tier 1” areas.
Program Delivery Starts with Certified Crop Advisors (CCA’s)

• **Step 1:** CCA meets with producer, reviews resource concerns and makes recommendations

• **Step 2:** Producer agrees to implement eligible practice(s)

• **Step 3:** Funded projects move forward; **CCA handles NRCS paperwork and documentation for producer**

• **Step 4:** CCA representative, in consultation with NRCS, confirms proper implementation and provides technical assistance as needed. **NRCS retains responsibility for compliance determination and payment to the producer.**

• **Step 5:** CCA regularly monitors implementation, conservation partners track outcomes and progress using online tools
Collaboration

This project already brings key partners from across several sectors:

- **Agronomy Retailers** (Direct program delivery)
- **Resource Groups** (Conservation technical assistance support, monitoring and evaluation)
- **Higher Education** (Michigan State University would play a role in the monitoring and evaluation effort.)
- **Commodity Groups** (Outreach to landowners and project support)
- **Food Manufacturers** (Project support)

...and as we reach consensus on commitments from each partner, this list will grow!
Monitoring, Evaluation and Reporting

The Nature Conservancy’s Great Lakes Watershed Management System will serve as the baseline planning and training tool for agronomy retailers to deliver targeted, high-impact conservation practices.

This tool will enable the partnership to track inputs (acreage, programs and practices) but also measure and track outcomes of these efforts.
Integrated Farming Systems℠ Would Combine Advanced Seed Genetics, On-farm Agronomic Practices, Software and Hardware Innovations to Drive Yield

**Database Backbone**
- Expansive seed-by-environment testing makes on-farm prescriptions available for certified seed dealer sales and service.

**Breeding**
- Significant increases in data points collected per year to increase annual rate genetic gain

**Yield Monitor**
- Advances in Yield Monitoring to deliver higher resolution data

**Fertility & Disease Management**
- “Apps” for in-season custom application of supplemental late nitrogen and fungicides

**Precision Seeding**
- Planter systems enabling scripts for variable rate seeding with optimal row spacing of hybrids in a field by yield management zone.

**Variable-Rate Fertility**
- Variable rate N, P & K “Apps” aligned with yield management zones

An illustration of “Integrated Farming Systems,” a vision of potential AgTech innovations.  **Source:** “Precision Planting/Monsanto Field Scripts program,” *Precision Planting* 2012
FUTURE - SUSTAINABILITY

REDUCED CARBON FOOTPRINT

» Fertilizer
» Fuel
» Irrigation

ENVIRONMENTAL IMPACT

CORPORATE RESPONSE
“STRIVE TO BE WHERE THE PUCK IS GOING TO BE, NOT WHERE IT HAS BEEN!”

Wayne Gretzky