Innovation in the Wheat Industry

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AEIC Spring Meeting
April 19, 2012
The World Needs Wheat

• Need to **double global food production** by 2050 to feed an estimated 9 billion people

• Wheat accounts for 20 percent of the world’s caloric intake *(Source: FAO)*
What the Future Needs

• Make wheat an attractive crop producers will choose to grow

• This requires
  o Public and private research
  o The entire wheat chain working together through dialogue and outreach
Wheat is Not Just Wheat

US Per Capita Wheat Flour Use

Source: USDA, Economic Research Service using data from ERS calculations using data from U.S. Department of Commerce, Bureau of Economic Analysis (population and trade) and Census Bureau, MQ311A.
World wheat production occurs between about the 25\textsuperscript{th} and 55\textsuperscript{th} degrees, N & S latitudes.
Corn vs. Wheat

Yield Comparison - Wheat and Corn
United States

- Corn
- Wheat

Yield - Bushels per Acre
Net Returns Per Acre

USDA PROJECTIONS

NET RETURN PER ACRE

Corn
Wheat
Soybeans

Wheat Acres Declining

Wheat Diseases and Challenges

- grain quality
- wheat stem sawfly, Hessian fly, other insects
- stem, leaf and stripe rust diseases
- Fusarium head blight
- foliar diseases, root diseases
- powdery mildew, septoria diseases
- crown rot, root diseases
- Nematodes, aphid management/control
- post-harvest sprout tolerance
- drought and heat stress, cold stress,
- spring freeze damage
- weed management
- dual-use
Achieve a 20% yield increase by 2018
Paving the Way for New Technology
The Case for Biotech Wheat” (Sept. 2009)

- Wheat acres are on a downward trend
- Net returns per acre to farmers favor other crops
- The wheat industry must change the equation
- Biotechnology can make a significant contribution
- Choice in the marketplace is fundamental.
1. Wheat is a vital, staple food

2. Biotechnology has been proven to reduce plant pests & diseases; increase productivity

3. Wheat, as a crop, is under pressure. Land area is in decline.


5. Biotechnology is well regulated; has proven safety, performance and quality improvement record;

6. Investment in wheat research runs far behind competition
Principles for Commercialization

Originally adopted by NAWG and USW in 2004

1. Tech provider dialogue with USW/NAWG
2. Major market approvals
3. Low level presence thresholds
4. Accurate, fast and economical detection tests
5. Education and outreach supported by tech providers
6. Stewardship of technology
7. Value capture model = certified seed system
Traits of Interest

- Drought tolerance
- Improved yield
- Disease tolerance, especially fusarium
- Nitrogen use efficiency

Nutritional improvements
Protein quality & quantity
New Investments in Wheat

• 2008 to 2011
  o Bayer CropScience – Winter wheat, CSIRO, Athenix, Evogene, U of Nebraska, RAGT Semences, SDSU, Texas A&M
  o Monsanto – WestBred, InterGrain, KSU, BASF, VA Tech
  o Syngenta – Agri-Pro, Resource Seeds and Goldsmith Seeds, CIMMYT
  o Limagrain – North American program, seed companies, Idaho State
  o Dow AgroSciences – Northwest Plant Breeding HRZ Wheats
  o Arcadia Biosciences – CSIRO & ACPFG, Limagrain
  o KWS Cereals USA And more to come...
Timing is everything. When biotech wheat is ready, the entire industry needs to be ready.

- Seedsman
- Farmer
- Handler
- Baker
- Miller
- Exporter
Wheat Related Organizations

- NATIONAL ASSOCIATION OF WHEAT GROWERS – www.wheatworld.org/research and wheatworld.org

- US WHEAT ASSOCIATES – www.uswheat.org

- NATIONAL WHEAT IMPROVEMENT COMMITTEE -

- WHEAT FOODS COUNCIL - www.wheatfoods.org/

- GRAIN FOODS FOUNDATION – www.grainpower.org
Wheat Related Organizations Cont’d

- INTERNATIONAL GRAINS PROGRAM – www.ksu.edu/igp
- NORTHERN CROPS INSTITUTE – www.northern-crops.com
- WHEAT MARKETING CENTER – www.wmcinc.org
- AMERICAN INSTITUTE OF BAKING – www.aibonline.org
- AMERICAN ASSOCIATION OF CEREAL CHEMISTS – www.aaccnet.org
- WHEAT QUALITY COUNCIL - www.wheatqualitycouncil.org
Wheat Related Organizations Cont’d

- INTERNATIONAL WHEAT GENOME SEQUENCING CONSORTIUM – www.wheatgenome.org

- NORTH AMERICAN MILLERS’ ASSOCIATION – www.namamillers.org

- AMERICAN BAKERS ASSOCIATION – www.americanbakers.org

- NORTH AMERICAN EXPORT GRAIN ASSOCIATION - www.naega.org
Innovation Now and for the Future

- **Innovation is needed** – wheat has fallen behind, the world needs food
- Wheat industry is **working together** toward responsible commercialization of biotechnology
- Public and private organizations have responded to calls from growers in the U.S., Canada and Australia for **more investment in wheat**