Partners in Innovation

Jim Bagshaw, Canadian Seeds Marketing Manager - Cereals

Challenges for Global Agriculture

- Food Grains demand to ~ double by 2050
- Annual demand growth > supply increase
- Limited farmland, limited opportunities to increase acreage
- Limited water supplies, fertilizer use restrictions, plus climate volatility

We must grow more from less

The only sustainable approach is to unlock the potential of plants through innovation

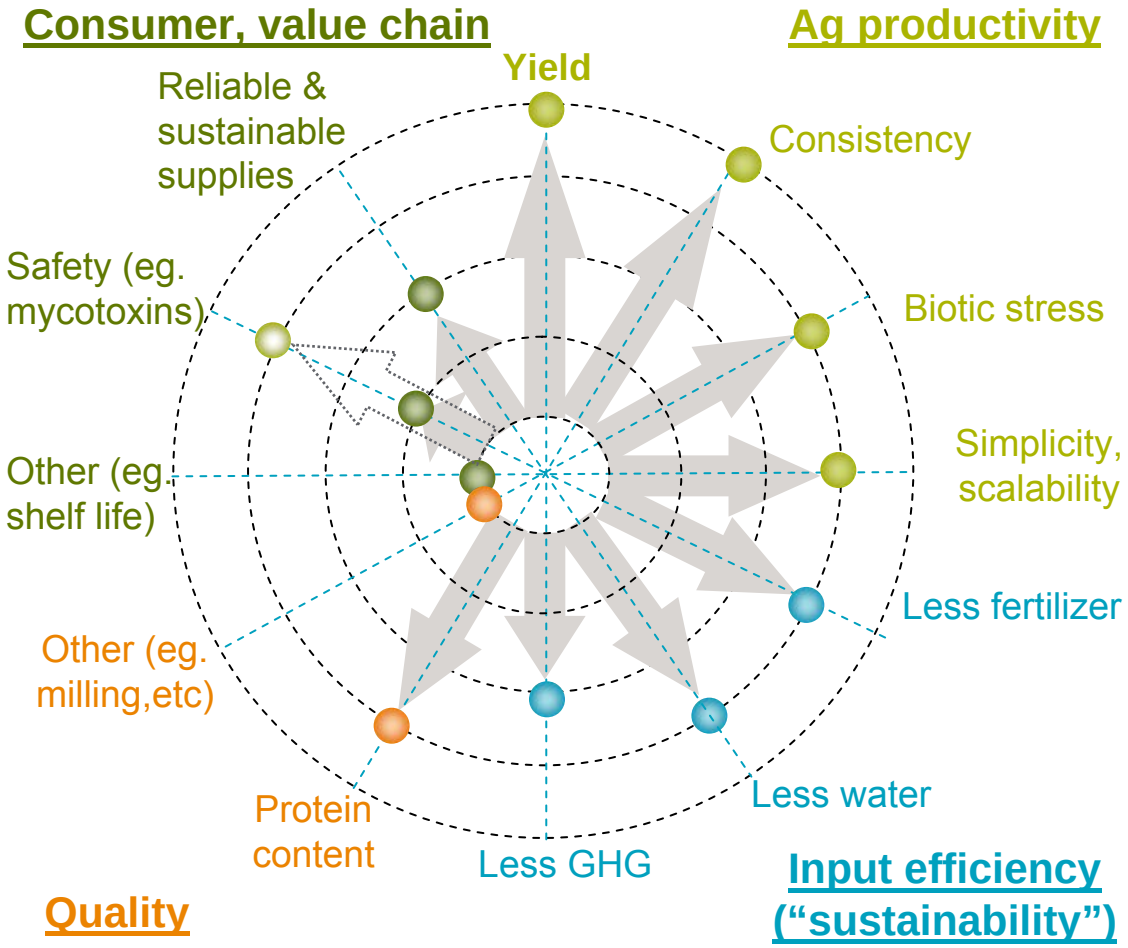
The landscape is changing

- Food security: self-sufficiency, yield imperative
- Commodity price volatility, but higher average price
- Sustainability agenda: increasing demand for input effectiveness (water, nitrogen, carbon)

Paradigm shift in technology:

- More focus on yield increase, but not only yield
- More acceptance: biotech, GM for food
- Better viability: hybrids, markers

Technology is not only about yield



Technology focus: "Yield + "

+ **Profitability**: grower's business mindset, incl. consistency, simplicity, scalability
+ **Input efficiency/ sustainability:** more output with less input
+ **Quality:** overcoming today's yield-quality tradeoffs
+ **Sustainability, safety:** as supplier to food chain

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Meeting the needs for yield plus .....

Input Efficiency

- Weed Control
- Disease Control
- Insect Control

Sustainability

- Water use efficiency
- Nutrient use efficiency
- Heat tolerance

Outputs

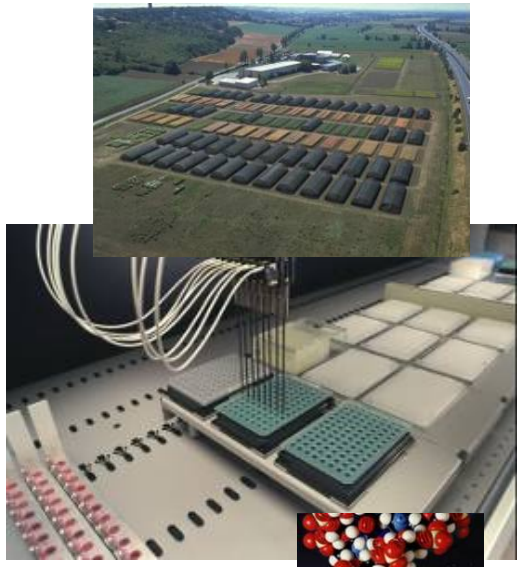
- Reduced mycotoxins
- Quality
  - milling, biofuels, nutritional value

Integration of Technologies

- Agronomy
- Chemicals – CP / CE / ST
- Genetics
  - Marker assisted breeding
  - Double haploids
  - Hybrids
  - Traits, native & GM

Syngenta's industry leading investment in breeding & genetics

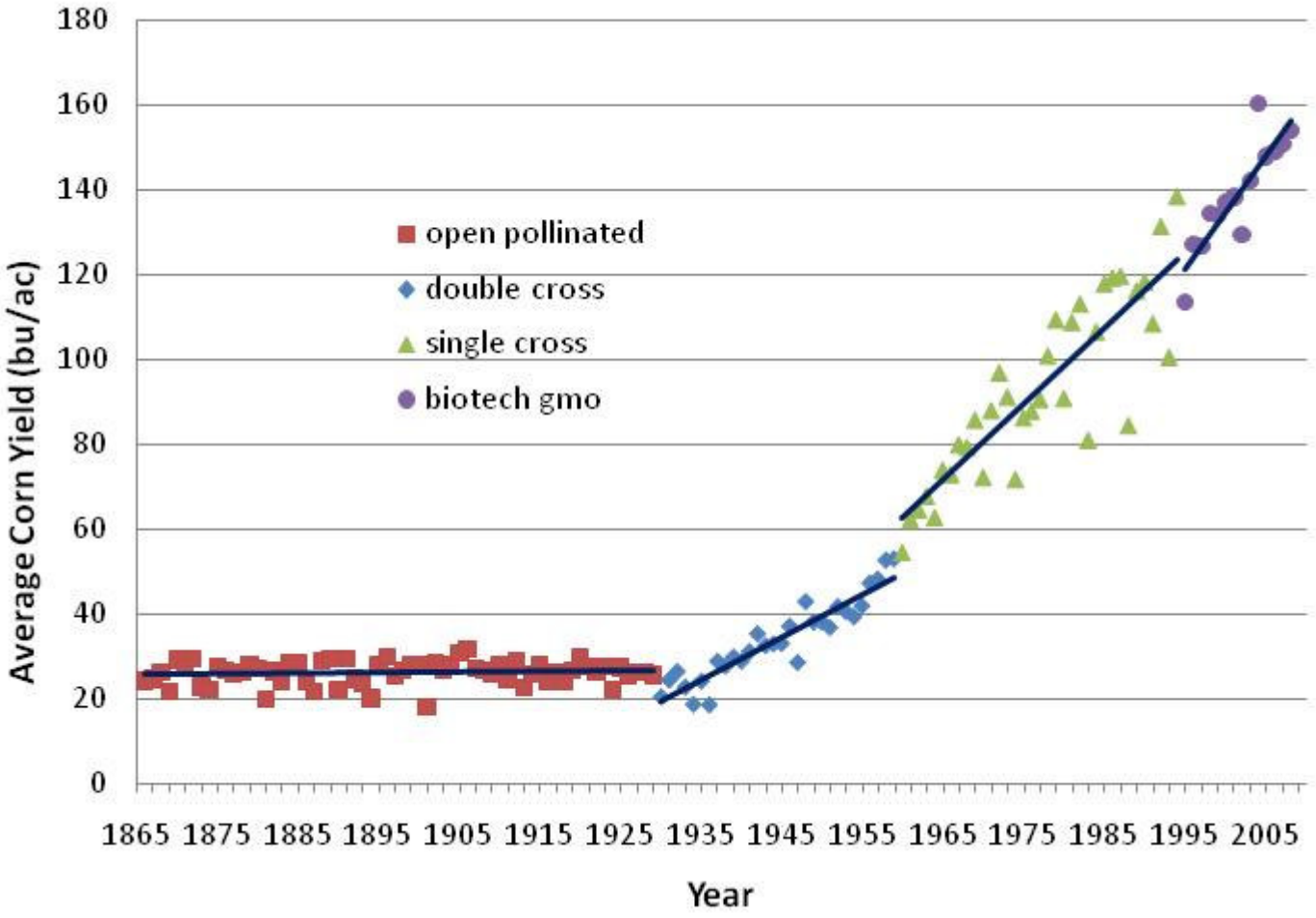
- **hybrid technologies**
  - Corn, soybean, barley (today) & wheat (future)
- **marker assisted breeding**
  - faster trait selection & introgression
  - move traits around the world quickly, novel combinations of traits
- **doubled-haploid technology**
  - allows breeders to select winners earlier
- **supporting cereal genomics**
  - leading wheat gene map & discovery tools
- **GM and native traits**
  - fusarium resistance, durable rust resistance
  - future trait pipeline: water & nitrogen use efficiency
- **partnerships to accelerate R&D**
  - eg recent CIMMYT global wheat partnership



New tools in the hands of breeders

significant improvements in yield & quality - faster

Hybrids and appropriable traits; return on investment (Breeding plus Cultural Practices)



Source: Adapted from Vivek, CIMMYT

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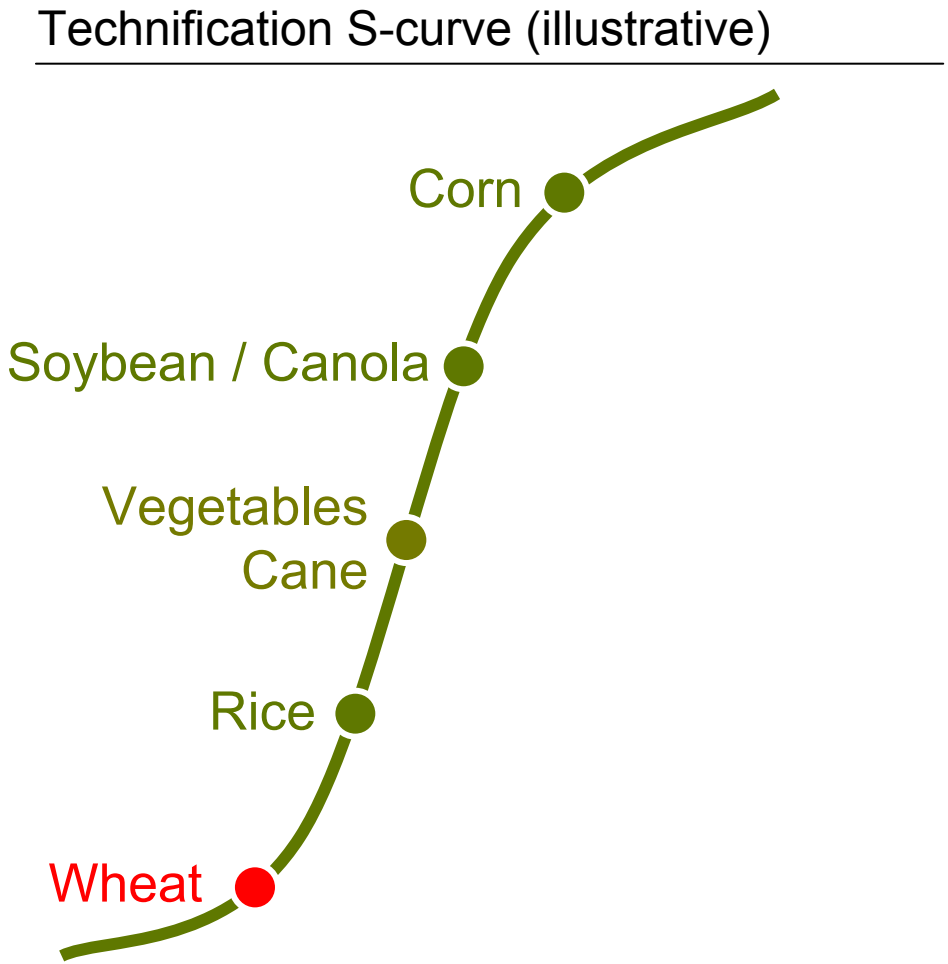
Technology Currently Incorporated into Major World Crops



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Industry Collaboration – One Key to Success
Public Private Partnerships (P3's)

- Launch Syngenta and CIMMYT Cereal research partnership
  - Public-private partnership to develop and advance technology in wheat
  - Joint R&D scope across broad crop protection and seeds technologies
  - Enhances Syngenta's market-leading worldwide R&D program in wheat
  - Reinforces CIMMYT's commitment to promoting food security

CIMMYT
International Maize and Wheat Improvement Center

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Industry Collaboration – One Key to Success
Private Collaborations

- Syngenta and Bayer to Cooperate on Soybean Herbicide Trait
  - Co-development agreement on a HPPD herbicide tolerance trait for soybeans

How do we make it happen?

- Regulatory Environment that encourages innovation
- Plant Variety Protection
  - Value-capture mechanisms to recoup research investment
- Robust, efficient, and balanced Intellectual Property protection system to stimulate and share innovation
  - Without some form of enforceable commercial protection, there would be no incentive to make required investments in plant breeding
- New innovation models that are more open and consultative

Bringing plant potential to life

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