

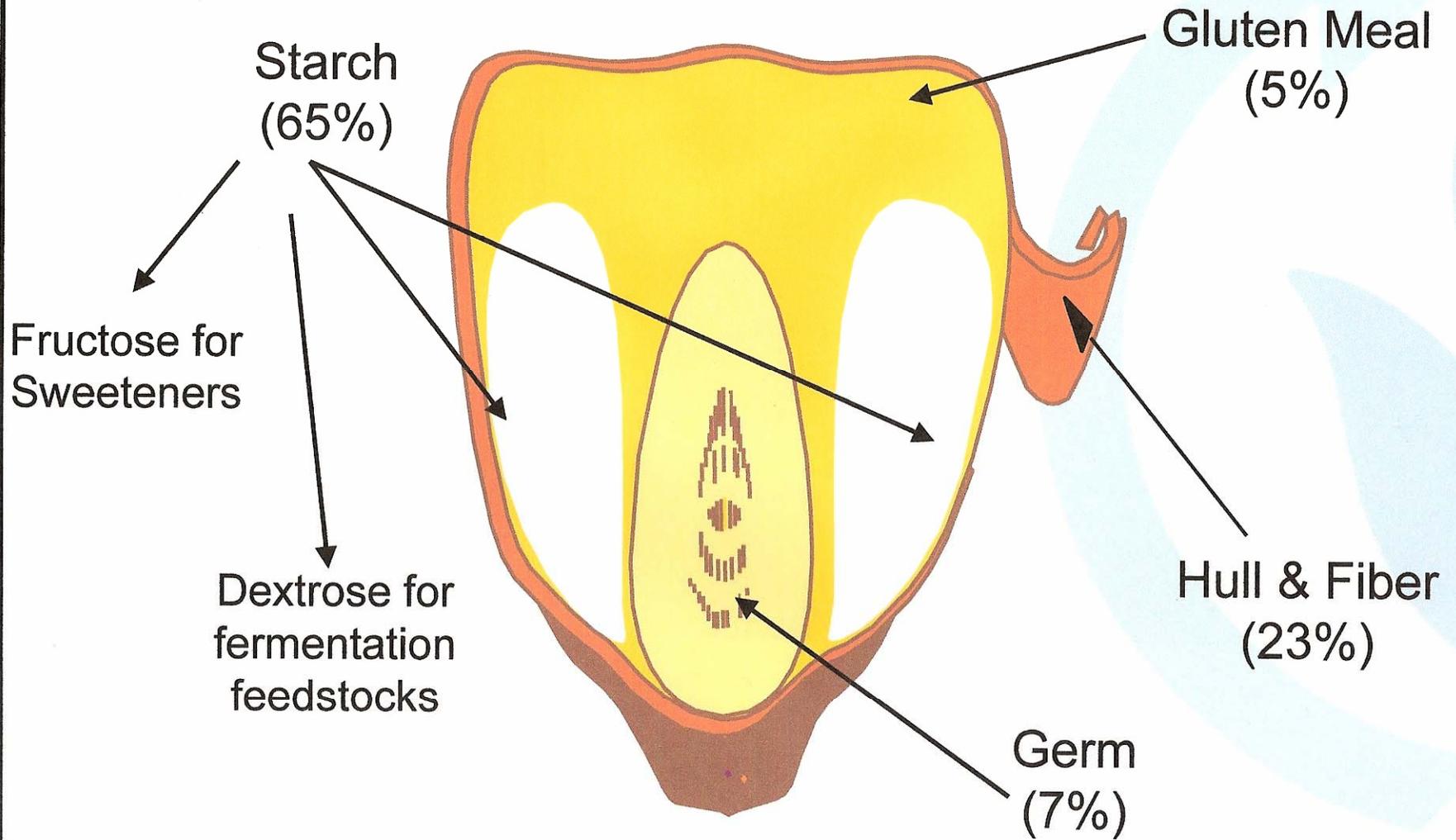


**Thinking
Biorenewables?**

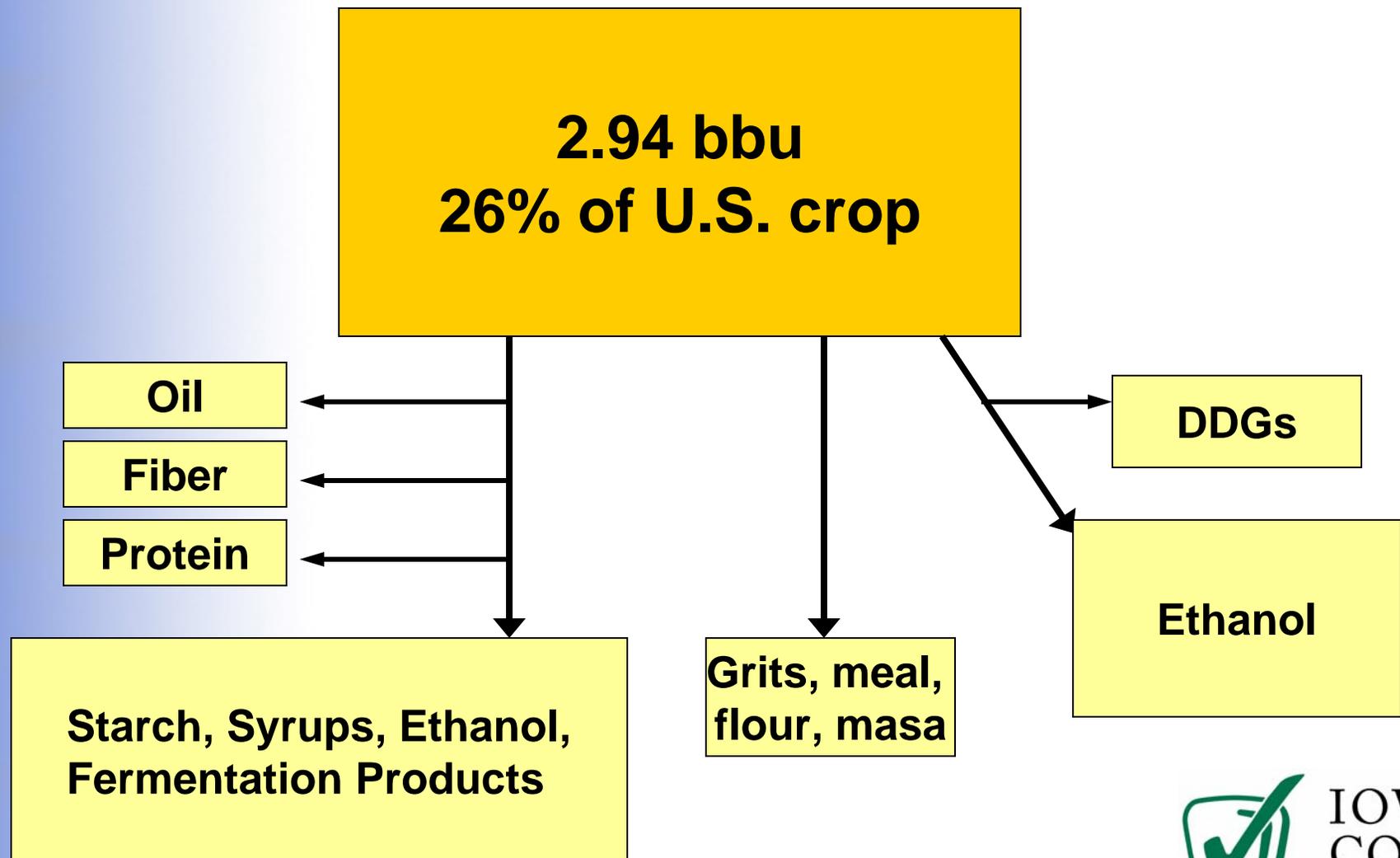
Think Corn!

Julius Schaaf, Farmer Director
Iowa Corn Promotion Board

Corn as the Feedstock



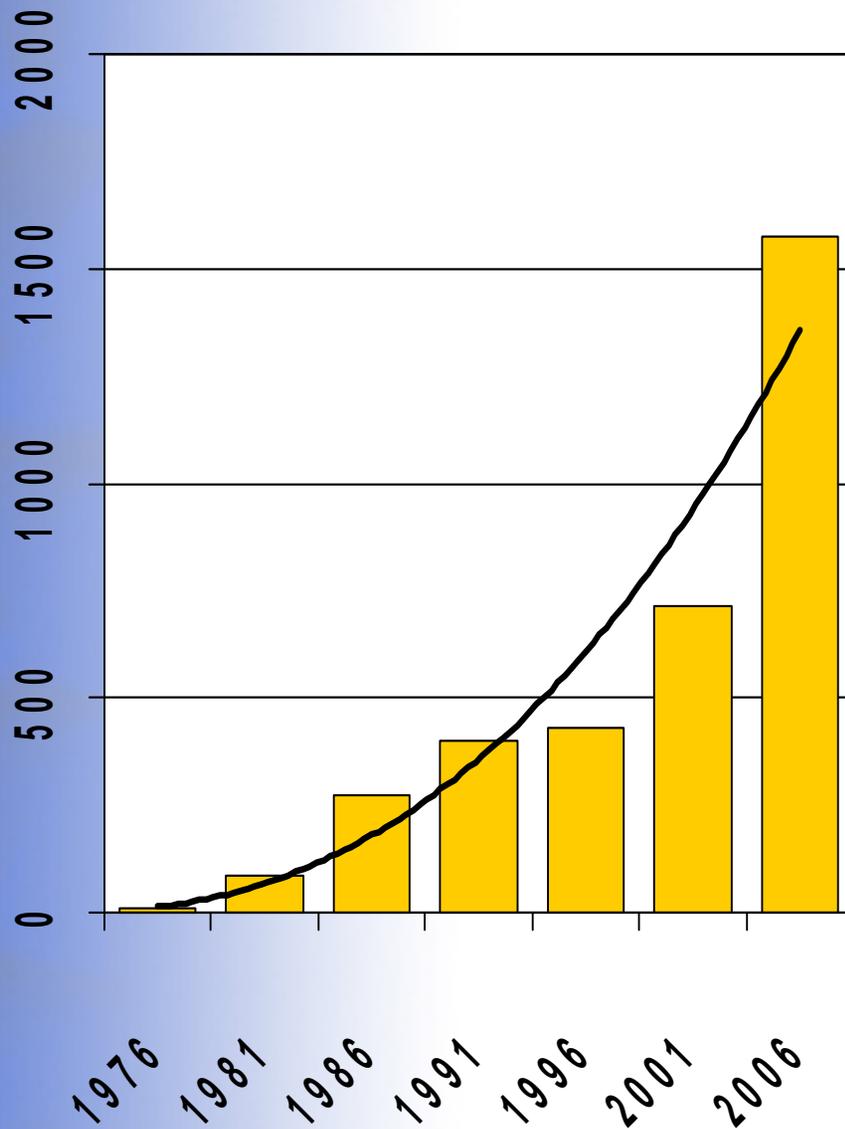
Corn Processing 2006



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Ethanol is just the start

Corn Use for Ethanol



Benefits in Iowa

- 3,700 jobs
- 6,000+ farmer investors
- \$2.6 million increase in local tax base
- \$841 million in revenue



Economic Impact on Farmers

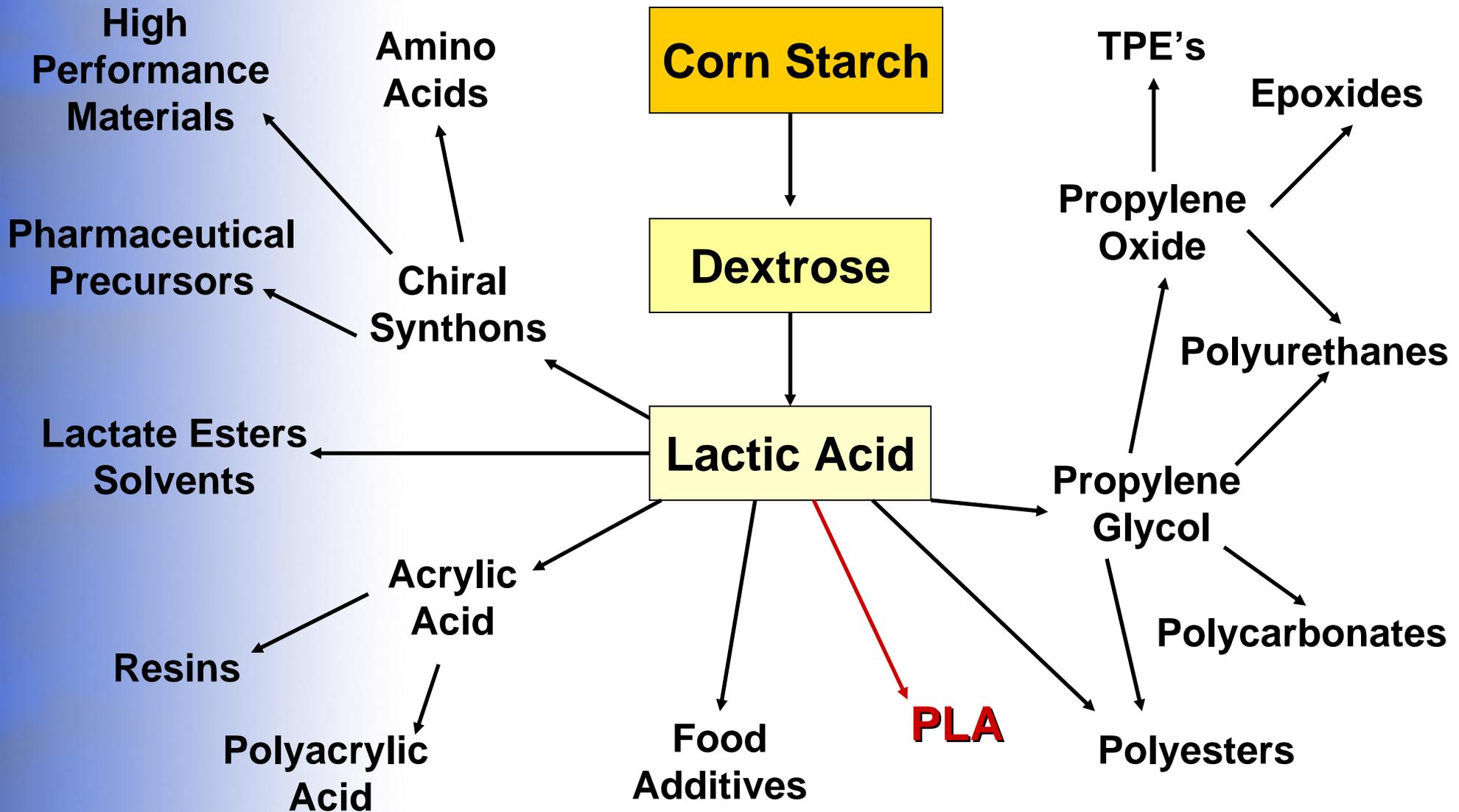
Farmer-Owned Plants

- \$910 million of Iowa corn purchased
- \$81 million additional farm gate income
- Up to 12¢ per bushel increase in value
- \$2.40 value added per bushel processed
- Statewide 4¢ to 5¢ improved basis
- Growing DG supplies benefit Iowa's livestock sector



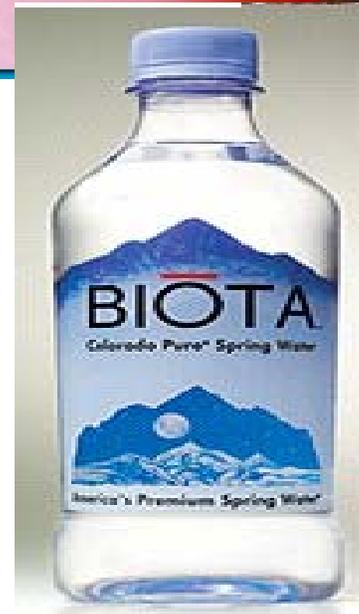
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A World of Potential



NatureWorks® PLA

- Ingeo™ fiber 
 - brand name for fabric and fiber products made from PLA
- NatureWorks® PLA
 - brand name for resin and packaging made from PLA





Resin and Packaging

- Europe, North America, Japan, Korea, Taiwan, Australia, New Zealand
- Used in
 - Serviceware (bowls, plates, cups, labels)
 - Bottles/jars/preformed packaging
 - Sheet/film
 - Rigid, heat-formed food packaging
- More than 50 companies



Textiles and Fibers

- Intermediate products
 - Fibers, yarn, filament, battings, nonwoven, woven, knit fabrics
- Apparel, hosiery
- Hygienic non-woven products
- Fiber-filled products
- Furnishings
 - Carpet, upholstered fabrics, home textiles
- 200+ partner companies





Examples

- Conical sleeves for flowers, plants
- Credit, debit, Smart, ID, gift, phone cards
- PLA-cotton blends
 - landscape fabric
 - plant pots
 - fertilizer bags
- Walmart adopting PLA to package produce

The Ultimate...





Corn Use for PLA

- Range of uses
- Varying levels of adoption
- Alternative feedstocks

- PLA use in Taiwan = 5 mbu corn by 2009
- Equivalent use in Japan = 28 mbu
- Equivalent use in U.S. = 56 mbu



Beyond PLA

- Research/commercialization time spans
- Critical role of public-private partnerships
- Criteria for success
 - Renewable resource
 - Replacing petroleum / other more hazardous products
 - Price competitive
 - Equivalent function or better



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Fiber Utilization/Polyols

- Separate fiber into component sugars
- Propylene glycol used in
 - Polyester resins, coatings, paints
 - Detergents
 - Drugs and cosmetics
 - 850 million pound market per year
- Ethylene glycol used in
 - PET and antifreeze
 - 5.6 billion pound market per year



Isosorbide

- Starch-based plastic additive
- Non-toxic blended material
- Current use mainly pharmaceuticals
- Replace oil, other chemicals in PET plastics, other materials
- Moldable plastics tolerate higher temps
- Market potential for 30-40 mbu corn per year



Hemicellulose

- Fiber → simple sugars → organic acids
- Feedstock for:
 - Industrial chemicals
 - Plastics
 - Solvents
- Advantages
 - Higher value
 - Renewable resource
 - Less price volatility
- Market potential = 40 mbu corn/year

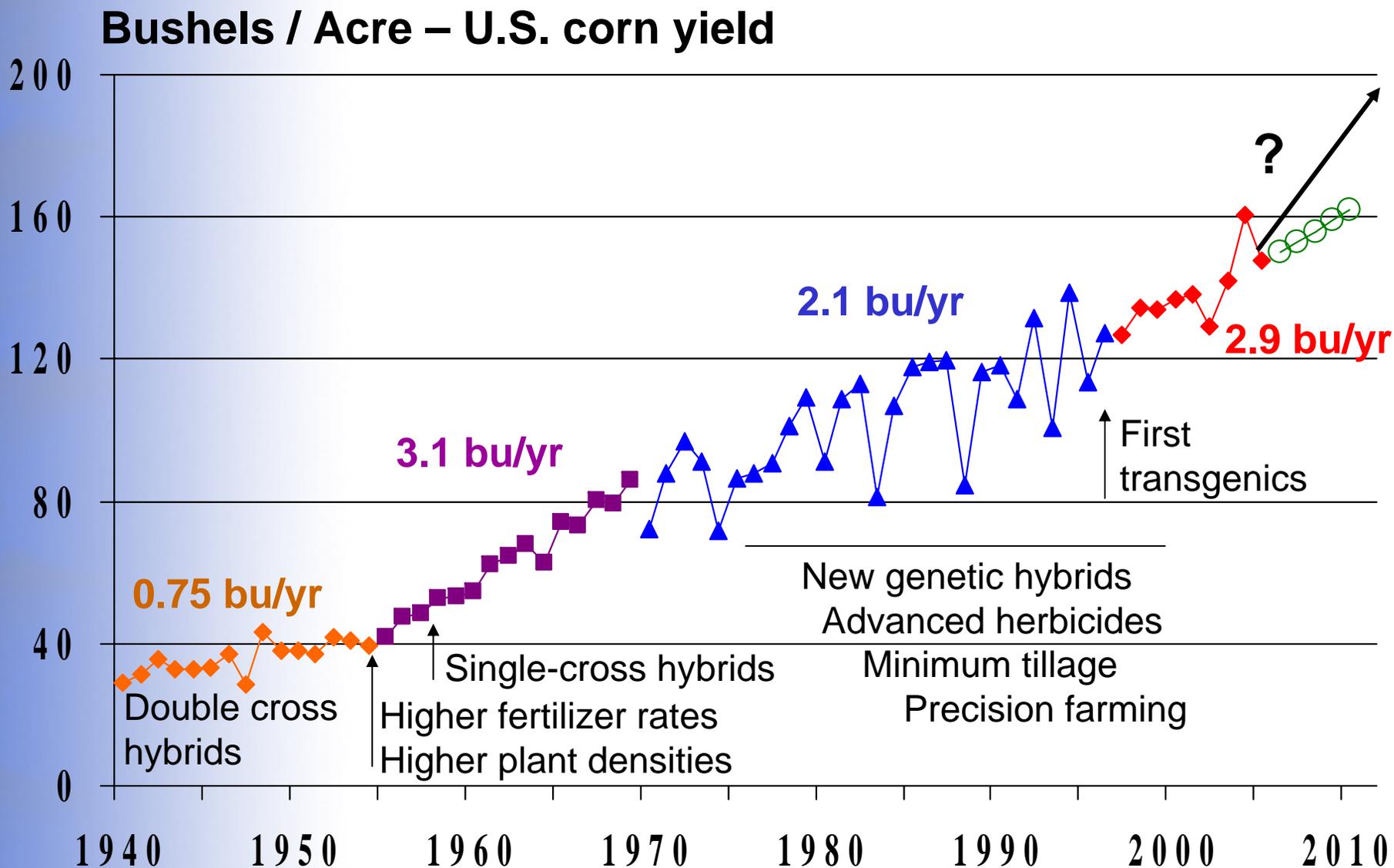


Corn Genome Research

- Essential groundwork before we can develop practical uses
- 60,000 genes in corn (human genome 30,000)
- Biotech, seed companies can follow “map” to develop new traits and benefits
 - Nutrition
 - Yields
 - New products
- No one can do this alone



U.S. Corn Yield Trend



Source: NASS



Other Supply Factors

- Changes in corn acreage
 - Shift north and west
 - Corn replacing other crops
 - Changes in crop rotation
- It's not just about corn
 - Soybeans / other oilseeds
 - Alternative crops
 - Biomass



Why does it matter?

- Better products for our society and environment
- Increased, diversified demand for crops
- Grower participation in value chain
- Reduced grower reliance on farm program would benefit government, taxpayers, and farmers

The image is a collage. On the left, there are several ears of corn. One is a large ear of red corn with a clear, grid-like pattern of kernels. Below it is a smaller ear of yellow corn. In the foreground, there are yellow corn husks and some dried corn cobs. On the right, there is a semi-transparent image of a cornfield with rows of corn stretching into the distance under a clear blue sky. The text 'Thank you' is overlaid on the right side of the image.

Thank you