

# BIODIESEL SUPPLY CHAIN



From Field to Fuel

Grant Kimberley - Soybean Farmer - Iowa Soybean Association

# KIMBERLEY FAMILY FARM

- Fifth and sixth generation farm family
- 4,000 acres: corn and soybeans
- Storage capability: 400,000 bushels
- Soybean yields increase: 30 to 55 bu/acre
- Corn yields increase: 115 to 200 bu/acre

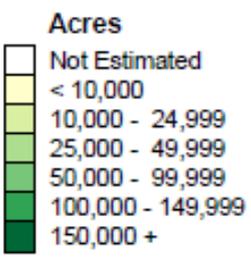
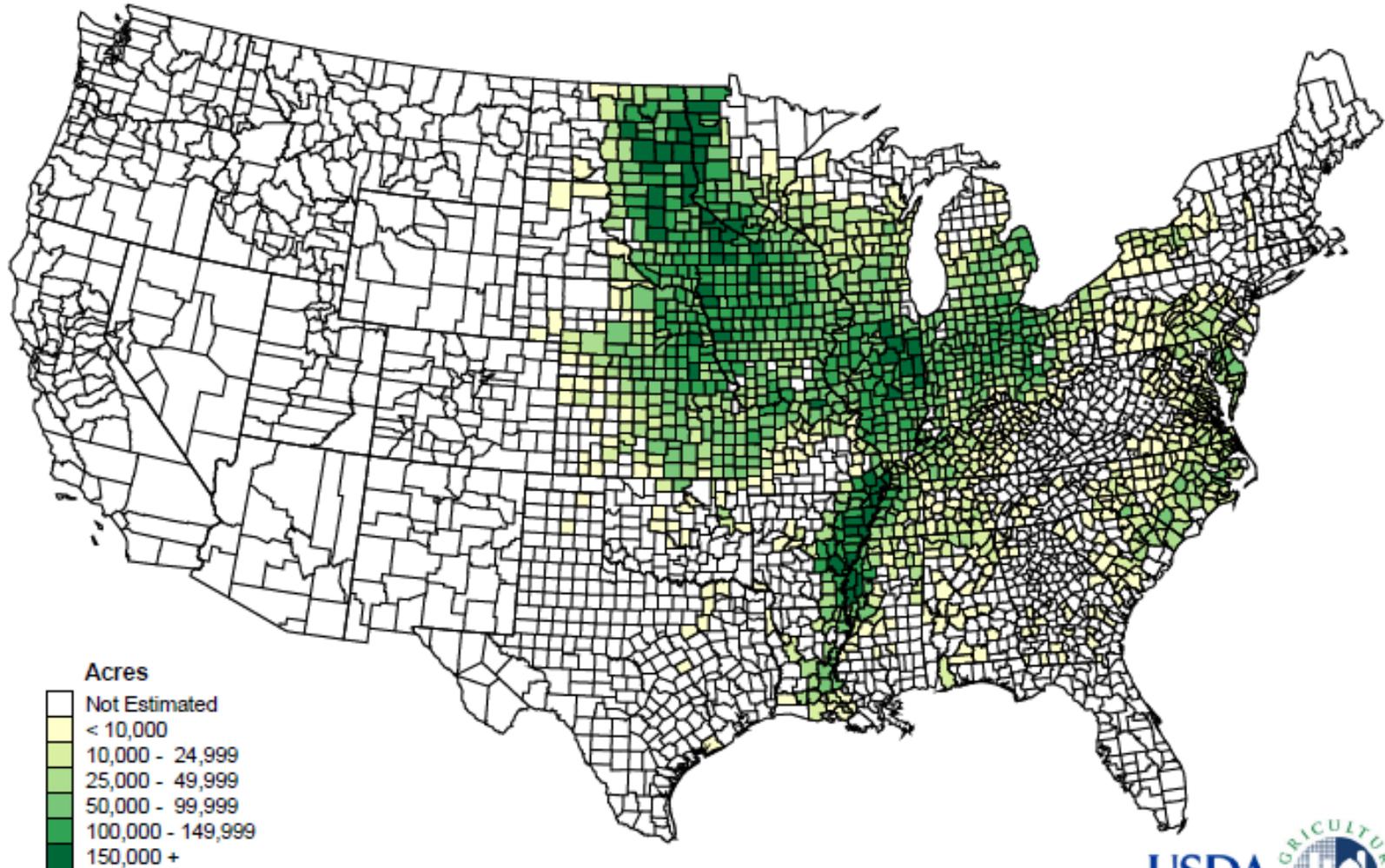


# CHINA VICE PRESIDENT XI JINPING VISITS IOWA

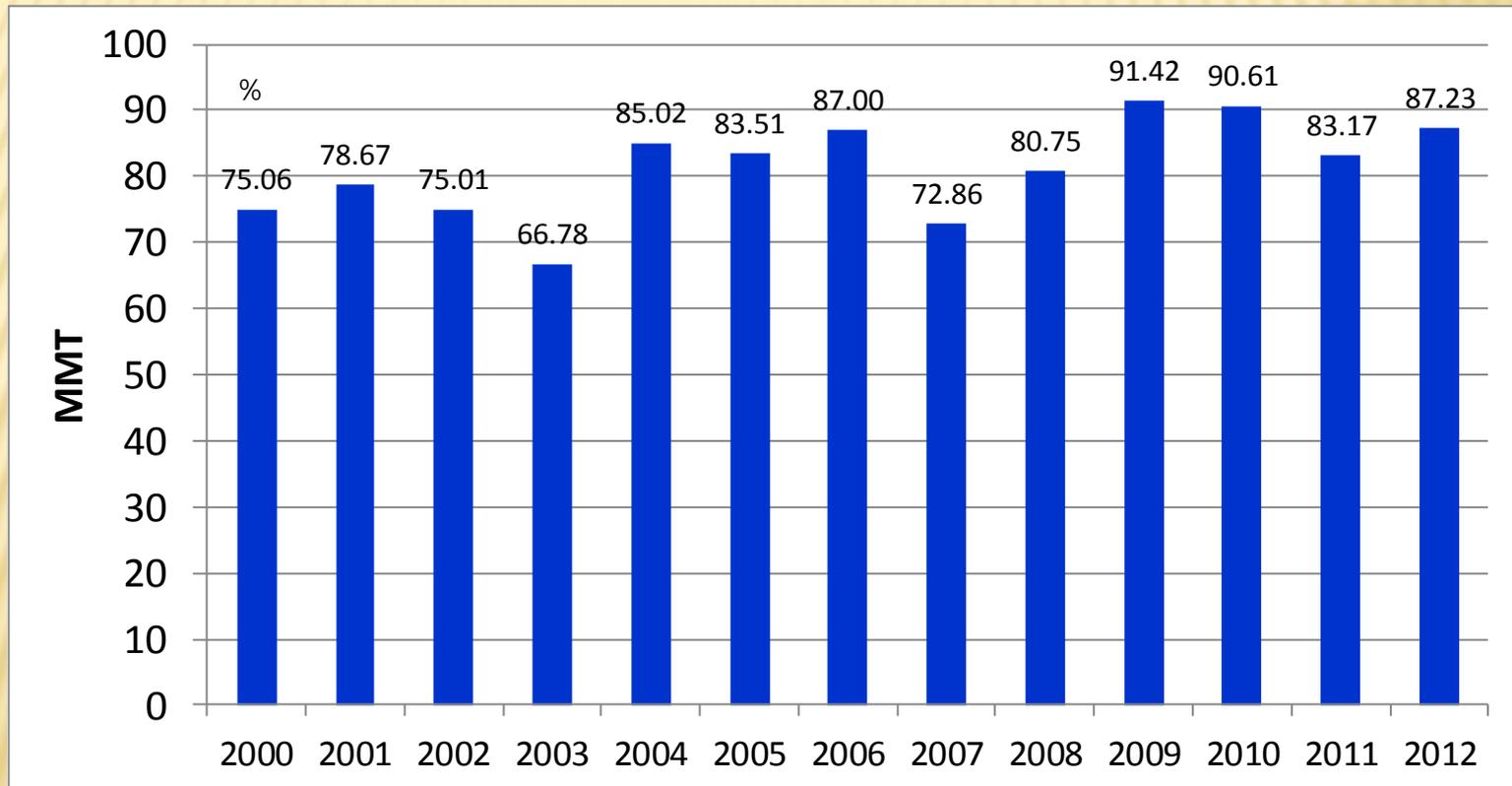




# Soybeans 2011 Harvested Acres by County for Selected States



# U.S. SOYBEAN PRODUCTION 2000-2011 AND USDA FORECAST FOR 2012



# WHAT CROP TO PLANT?

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- ✘ What grows well in my soil?
- ✘ What grows well in my climate?
- ✘ What equipment do I own?
- ✘ What will commodity prices be next year?
- ✘ What are the input costs for each crop?
- ✘ What infrastructure exists to market my crop?
- ✘ What crop insurance is available?
- ✘ What did I grow last year?
  - + Rotation to build soil nutrients, moisture, interrupt pests, etc.

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# SOYBEAN PLANTINGS ARE NOT DRIVEN BY BIODIESEL

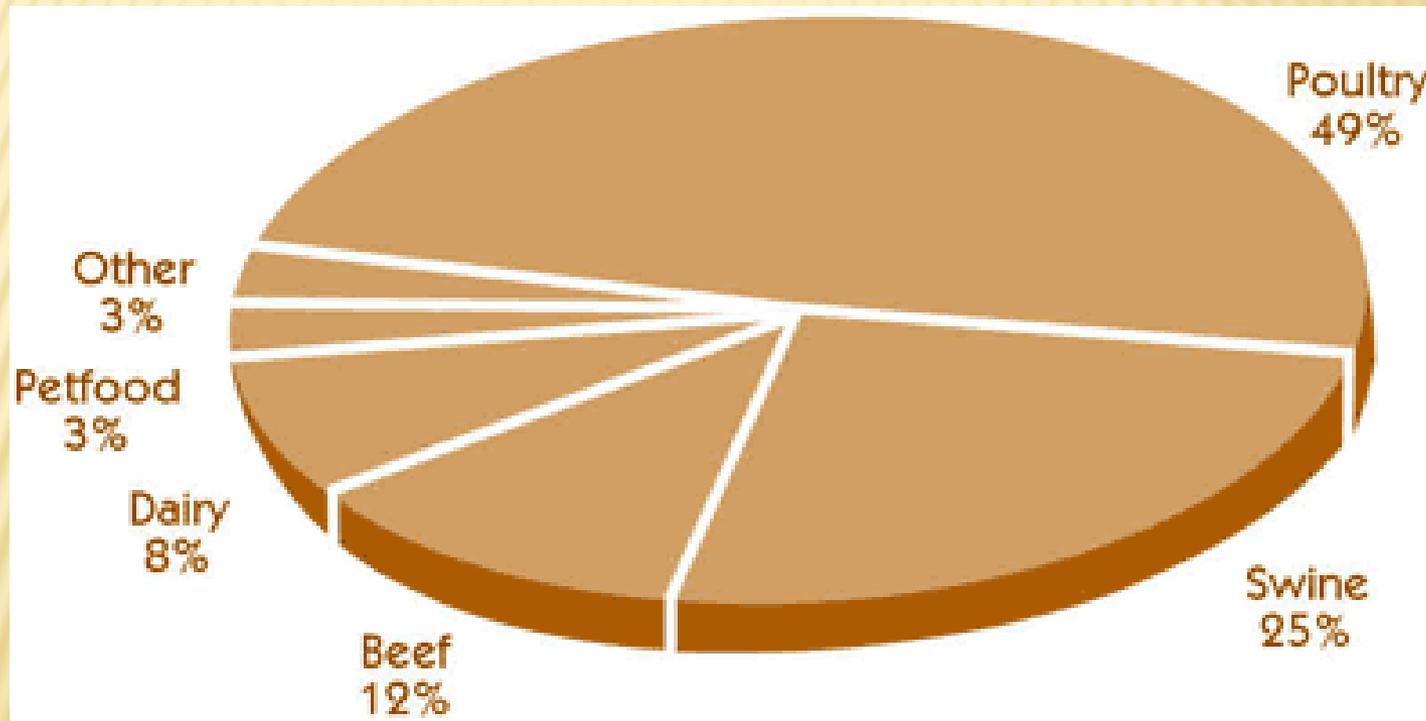
- ✘ Protein meal for livestock feed is the primary driver for soybean production
- ✘ Better utilization of the oil coproduct can reduce the price of the protein meal.



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# **SOYBEAN USE**

# SOYBEAN MEAL USE BY LIVESTOCK (DOMESTIC)



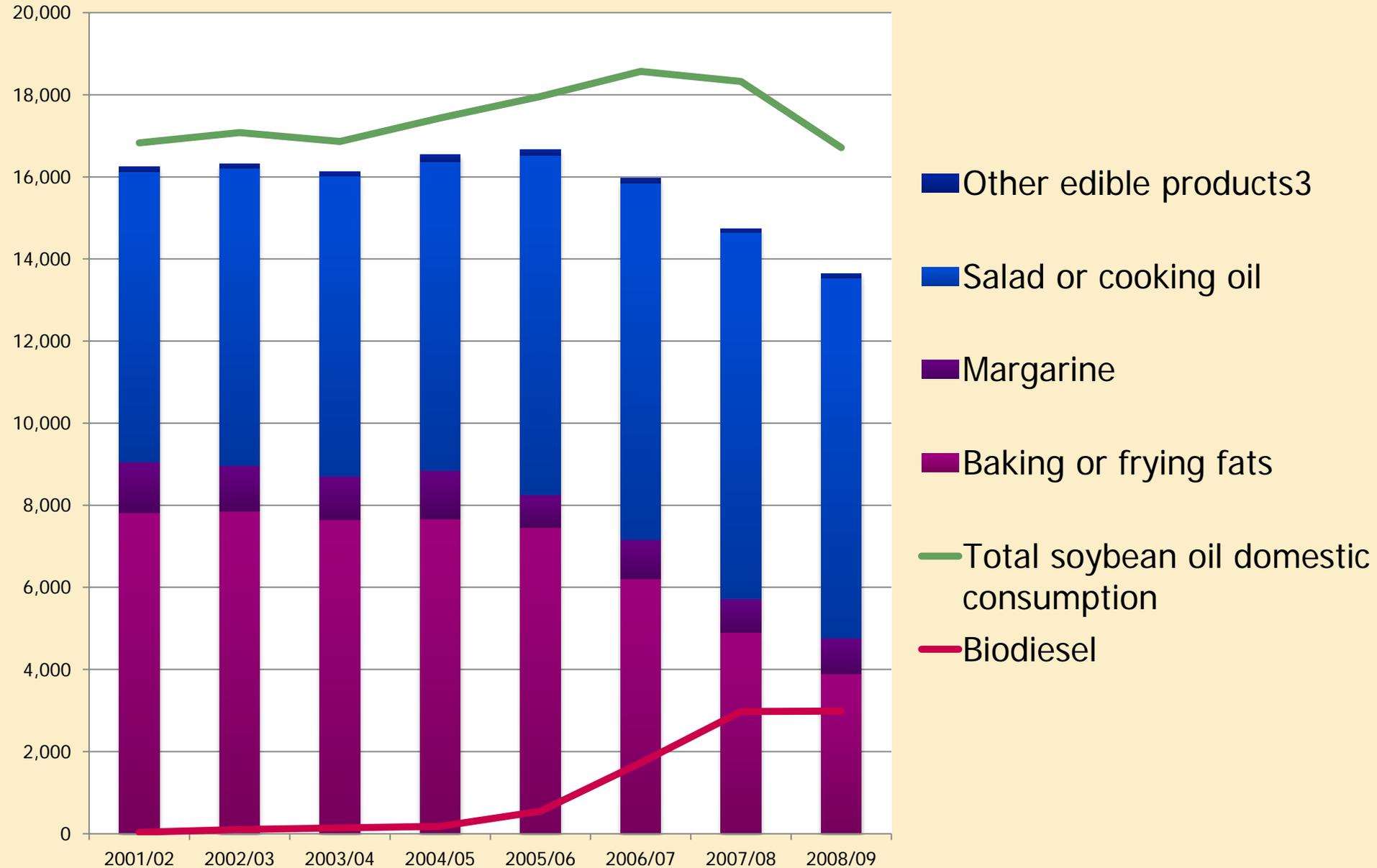
# AQUACULTURE RESEARCH



**TILAPIA AND SHRIMP ARE TWO OF THE LEADING CULTURED SEAFOOD IMPORT-EXPORT PRODUCTS GLOBALLY-BOTH ARE MAJOR U.S. IMPORT COMMODITIES**



# SOYBEAN OIL USE IN THE US



# PROCESS FARMERS GO THROUGH TO GROW SOYBEAN CROP.



# FALL ACTIVITIES (AFTER PREVIOUS HARVEST)

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- ✘ Work w/ crop consultant or coop to sample soil
  - + Sampled in grids to cover the whole farm and kept up-to-date
- ✘ Soil report used to plan application of N, P, K , and lime.
- ✘ Applied in 1-2 acre grids using GPS and precision application

# FALL ACTIVITIES (AFTER PREVIOUS HARVEST)

- ✘ Disk corn residue to help it break down into organic matter.
- ✘ For erosion prone soils, corn residue is left on the field and soybean are no-till planted.
- ✘ Nitrogen may be applied on ground that will be going to corn the following year.
- ✘ Soybeans fix nitrogen from the atmosphere into the soil.

# WINTER ACTIVITIES

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- ✘ Financial planning, marketing, business planning, etc.
- ✘ Repair equipment
- ✘ Begin selling stored grain-spread out over the entire year.

# SPRING ACTIVITIES

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- ✘ Seed grass to waterways, buffer strips, and terraces where needed.
- ✘ Complete fertilizer application & pre-emergent herbicide where necessary.
- ✘ Corn planted in April
- ✘ Begin soybean planting in May.
  - + Using conservation tillage or no-till.

# PLANTING SOYBEANS



Planting occurs in spring, but planning begins in the fall.

# CONSERVATION TILLAGE AND NO-TILL



# INCREASED EFFICIENCIES = LESS ENERGY BEING UTILIZED PER BUSHEL AND PER ACRE:

- Minimum till techniques for soybeans, strip till, and no till
- Equipment improvements with adoption of GPS and implements 60 feet or more
- Seed technology advances causing fewer passes through field
- Reduced on-farm energy use by 20% in last decade.



# SUMMER ACTIVITIES

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# HARVEST



# HARVEST



# HARVEST



# DELIVERING GRAIN TO BINS



# DELIVERING GRAIN TO BINS



# FARMER GRAIN BINS





# FARMER GRAIN BINS



# FARMER GRAIN BINS



# COOP & ELEVATOR STORAGE & TRANSPORTATION



# TERMINAL ELEVATOR



# GRAIN TRANSPORTATION



# CLAM SHELL LOADING RIVER BARGES

- ✘ BUSHEL EQUIVALENTS:
- ✘ One semi= 910 bushels
- ✘ One rail car= 4,000 bushels
- ✘ 110 car unit train= 440,000 bushels
- ✘ One barge= 52,500 bushels
- ✘ 15 barge tow= 787,000 bushels
- ✘ One Panamax ocean vessel= 2.1 million bushels



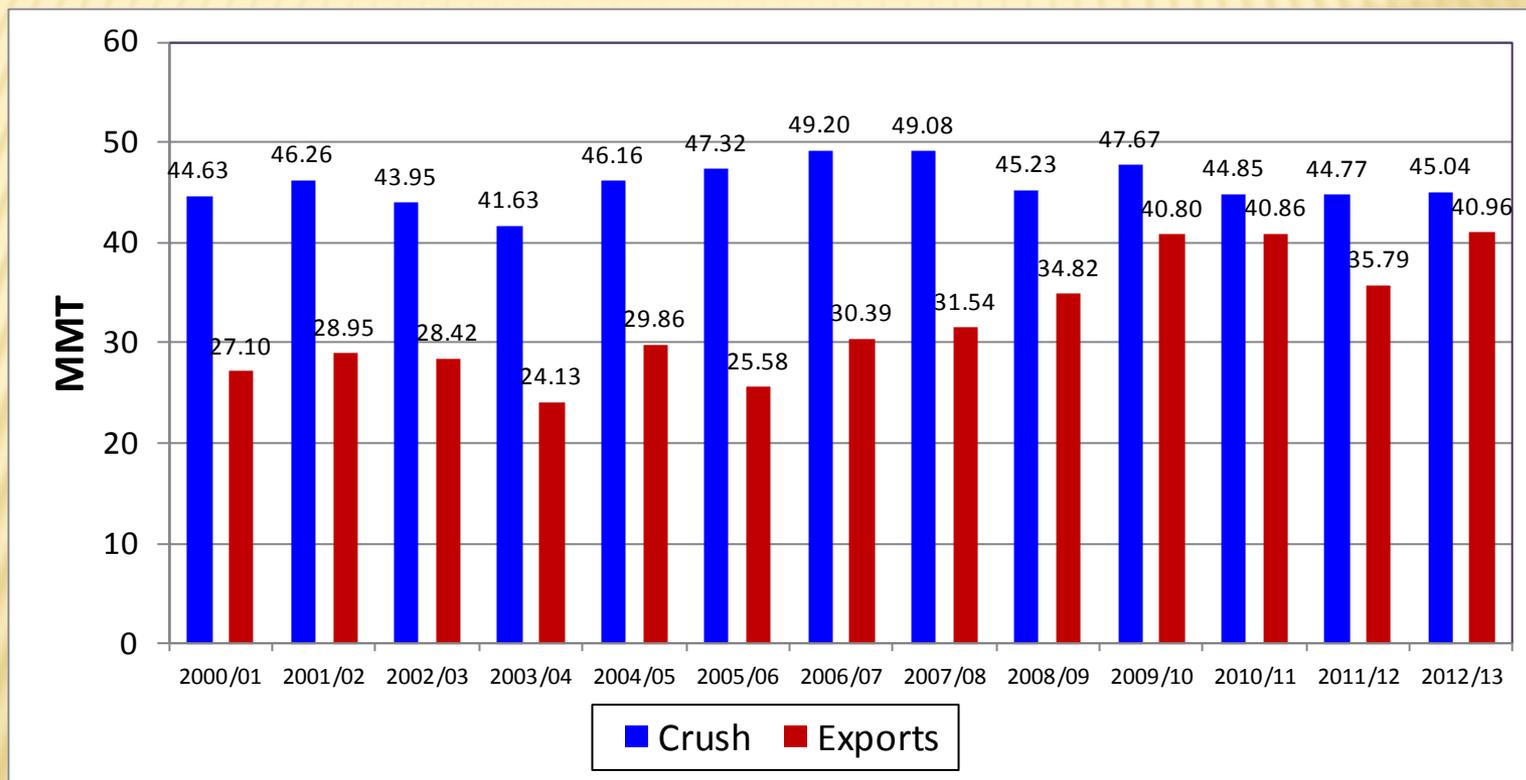
# GRAIN TRANSPORTATION



# GRAIN TRANSPORTATION



# U.S. SOYBEAN CRUSH AND EXPORTS 2000/10 - 2011/12 AND USDA FORECAST FOR 2012/13



# SIGNING CEREMONIES WITH CHINESE AGRICULTURE LEADERS IN IOWA & LOS ANGELES

*China committed to purchase 492.3 million bushels (13.4 million metric tons) of U.S. soybeans – estimated value of \$6.7 billion*



Those purchase pledges set a new record for U.S. soybean commitments made on a single visit to the U.S.

# SUMMARY

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- ✘ Soybeans are part of a system
  - + Rotation with corn or wheat
  - + Producing protein for livestock, strong global demand
- ✘ Technology optimizes yield
  - + Precision application of fertilizer
  - + Conservation tillage
  - + Crop scouting to identify pest management
- ✘ Efficient storage & transportation infrastructure, designed for large volumes
  - + Fungibility essential to economic viability