

Clouds on the Ethanol Horizon

NDSU Biomass Forum
April 11, 2007

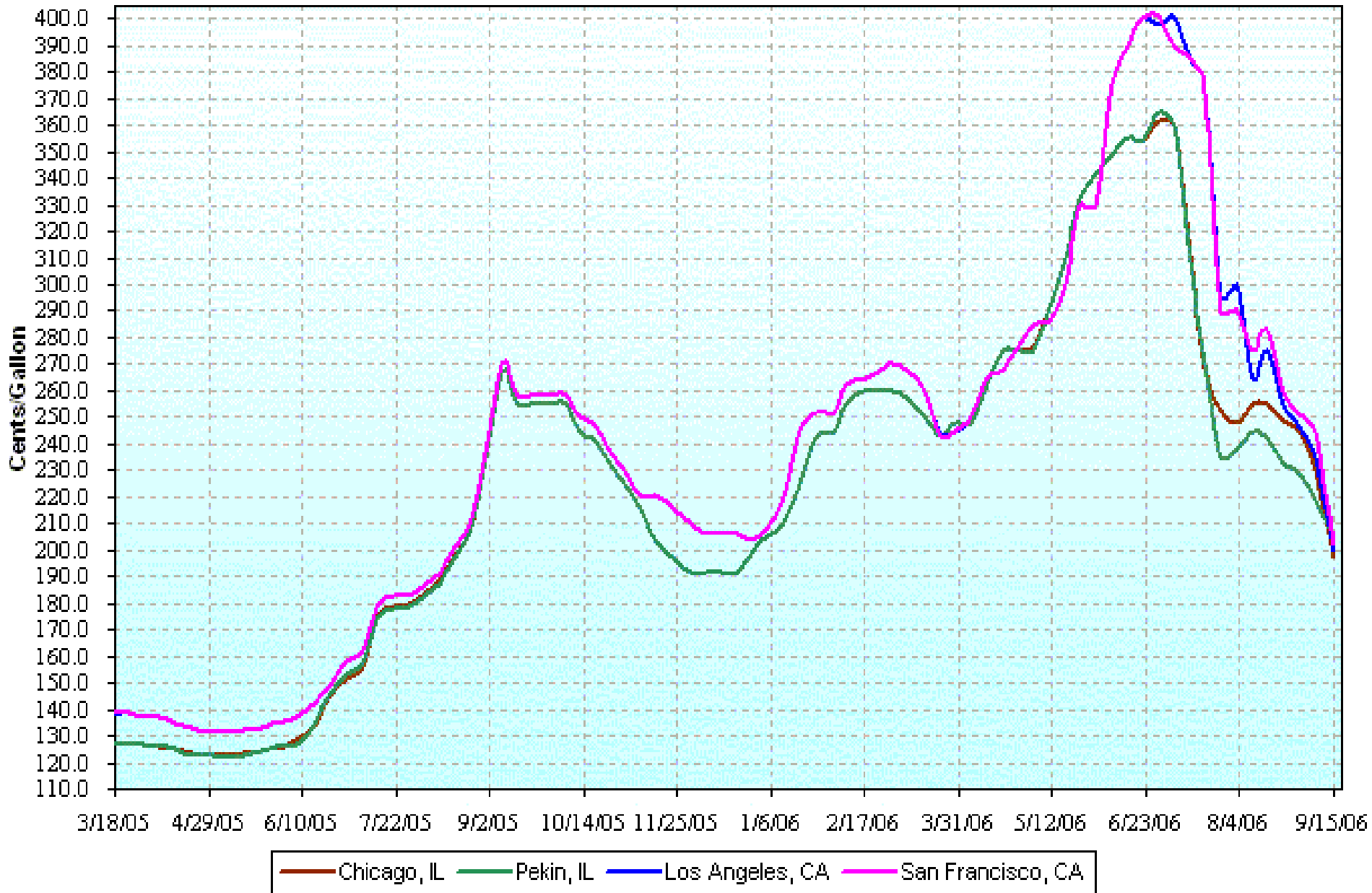
Dr. Cole R. Gustafson
North Dakota State University

cole.gustafson@ndsu.edu

Bio-fuel Frenzy

- Tax credits, tariffs, blend mandate
 - Payback, < 3 years
 - \$3 billion capital flow to ag. (WSJ)
 - Farmer investment, 47 to 12 percent
 - Loss of rural jobs (ISU)
- RFS sunsets in 2010
 - Food/feed prices, quality, environment, water
 - Ag. sector now tied to energy market

Fuel Ethanol Terminal Market Price - 18-Month History



Data Source: OXY-FUEL News Price Report. 1995-2005 Hart Publications, Inc.

What an Average Ethanol Plant Can Pay for Corn...

| Ethanol Price | And cover variable costs | And cover variable costs <i>plus int., dep., & taxes</i> |
|---|--------------------------|--|
| \$1.85/gal. <i>DDG prices stable</i> | \$4.50 | \$3.55 |
| \$1.85/gal <i>DDG prices rise</i> | \$5.50 | \$4.15 |
| \$2.35/gal <i>DDG prices rise</i> | \$7.50 | \$6.10 |

Bio-fuel Frenzy

- Use of contracts will impact farmers
 - Staying power of plants
 - Access to DDG's
- Railcar shortage
- Nimble response to new technology
 - Field peas
 - Biomass

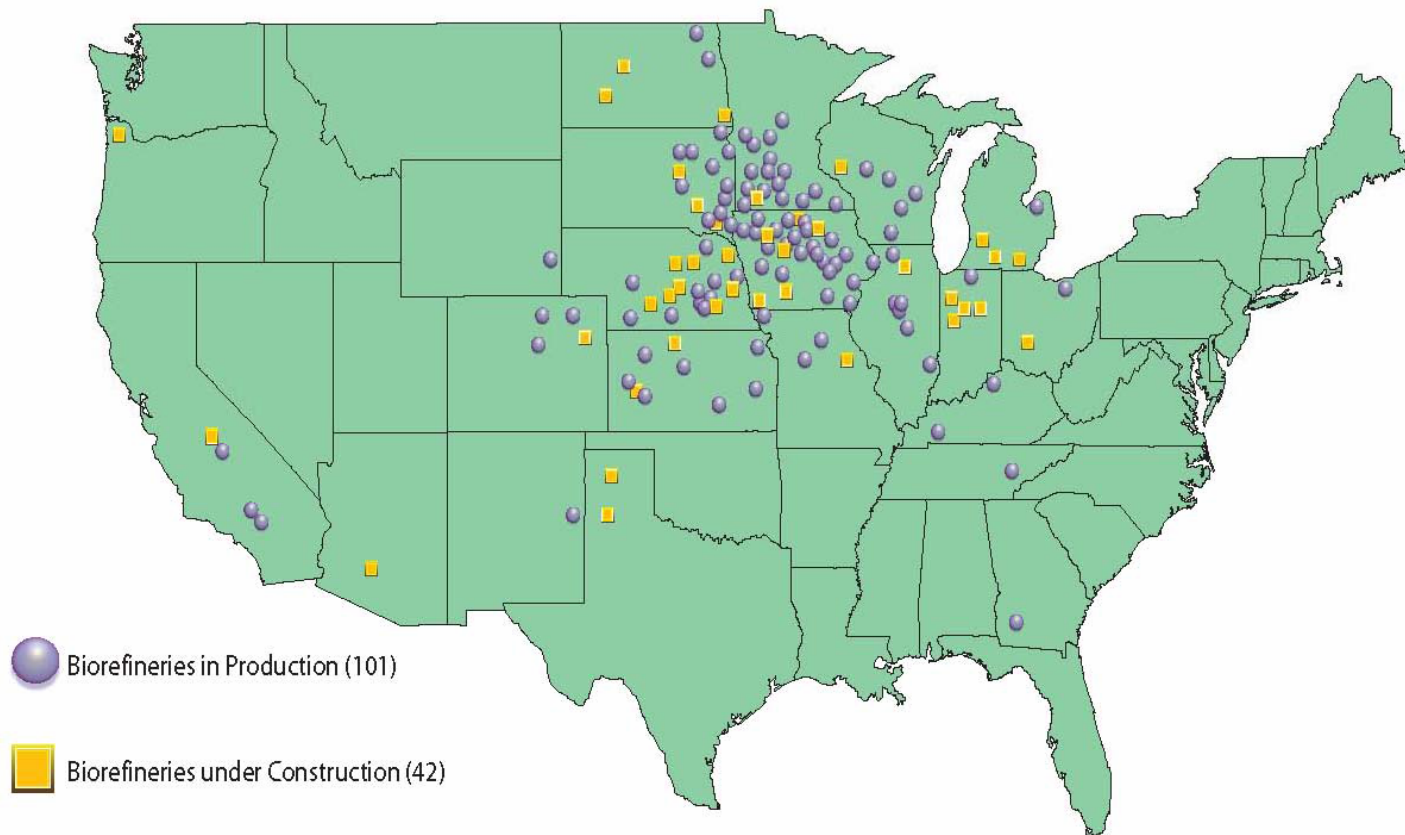
Questions?

The background of the slide features a repeating pattern of stylized, overlapping leaves. The leaves are rendered in various shades of orange, from light to dark, and brown, creating a textured, autumnal effect. The overall color palette is warm and monochromatic.

Some Energy Statistics

- In 2005, the U.S.
 - consumed 139.9 billion gallons of gasoline
 - produced 3.9 billion gallons of ethanol
 - consumed 43.2 billion gallons of diesel
 - produced 75 million gallons of biodiesel
 - imported 65 percent of all petroleum

U.S. Ethanol Biorefinery Locations



Source: Renewable Fuels Association

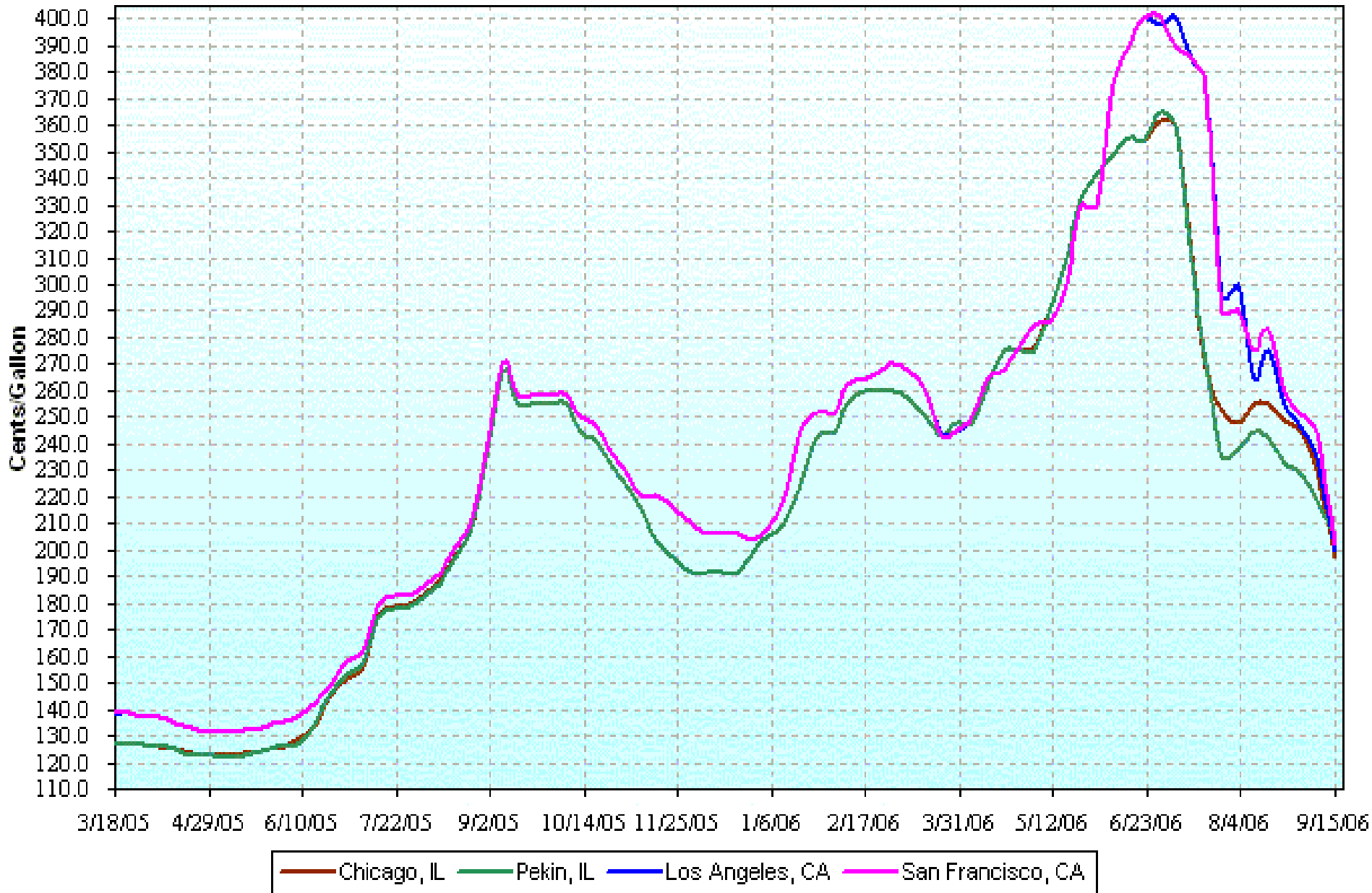
Ethanol Plant Ownership

- Current Plants
 - 47 percent of plants are farmer owned
 - 39 percent of production from farmer owned
- Plants under Construction
 - 12 percent of plants are farmer owned
 - 11 percent of production farmer owned
 - (25 percent loss of ownership => 29 jobs)

Why Frenzy?

- Large Payoffs (< 3 years)
- Shortage of Ethanol to meet RFS

Fuel Ethanol Terminal Market Price - 18-Month History



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C Z7 [10] - CORN (DAY)

LAST: 397'2

CHANGE: 4'6

HIGH: 398'0

LOW: 390'4

2/2/2007



CBOT ADVANTAGE

Corn used for Ethanol – U.S.

- 2005 – 11 percent of corn production used for ethanol
- 2007 – 25 percent of corn production used for ethanol
- by 2008 – N.D. plants will use 90 percent of 2006 production

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How is Agriculture Affected?

- Plan for \$3.75 corn
- Shift from corn to DDGS
- Corn basis affect modest
- Volatility of oil will impact agriculture
- Tax credits are not certain
- Rail car shortage
 - Other commodity prices lower
- Biomass is the future
 - Fractionation, fewer DDGS
 - New Enzymes, 5 years
 - \$40/ton
 - 100 m/gal = 60 trucks, 4 loads, 50 mile radius
 - Less impact on Environment (fert, chem)
 - Energy balance 4x-6x

New Biomass Plants

Spain, Commercial Plant

Denmark, Commercial Plant

California, Rice Straw Plant

Minnesota, Straw test run

Abengoa Energy, Chesterfield, MO - \$76m - corn, wheat, milo

ALICO, LaBelle, FL - \$33m - yard, wood, energycane

BlueFire Ethanol, Irvine, CA - \$40m - green/wood waste

Broin, Sioux Falls, SD - \$80m - corn fiber

Iogen, Shelley, ID - \$80m - wheat, barley straw

Range Fuels, Soperton, CA - \$76m - wood

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