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Biodiesel Plant Development Seminar

Larry Breeding

Biodiesel Operations

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**Biodiesel Plant
Development Seminar**


York, NE
August 25, 2005



WEST CENTRAL®





West Central Cooperative & the Biodiesel Industry
Larry Breeding; General Manager, Biodiesel Operations
Ralston, Iowa





West Central History

- West Central was incorporated in 1933 in Ralston, Iowa, which is still its headquarters
- West Central is governed by 9 elected board members and 2 appointed associate board members



West Central History

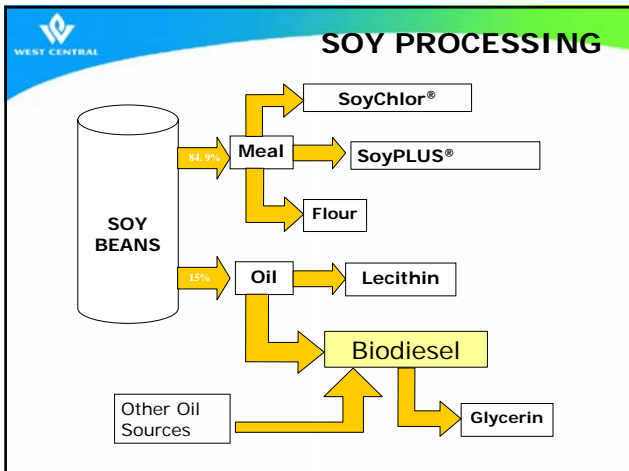
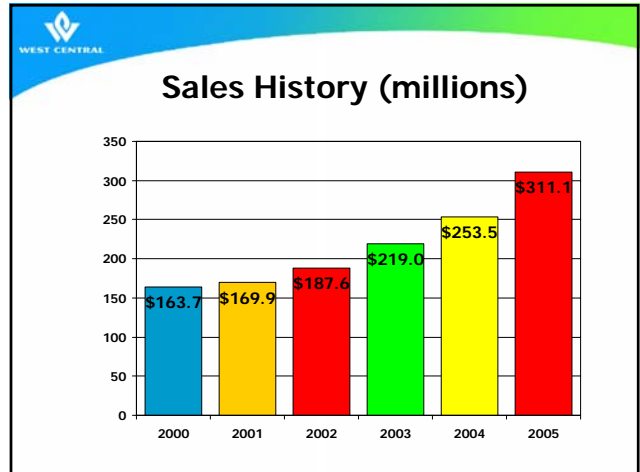
West Central's full-service 3,500+ farmer-owned cooperative is headquartered in Ralston, Iowa. West Central markets products throughout most of North America and to several other foreign destinations.



Operating divisions:
Grain, agronomy, feed, soy processing & administration

Annual Operations

- West Central employs 228 people
- Grain – markets 72 million bushels
- Agronomy – joint venture with Agriliance
- Feed – processes over 115,000 tons
- Soy Processing – processes 8.4 million bushels of soybeans and processes 90 million pounds of soy oil into methyl esters




Soy Nutrition Products

- SoyPLUS® (Dairy cow protein)
- SoyChlor® (Dairy cow treatment)
- Lecithin
- Soy Flour

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BIODIESEL PRODUCTION

Batch Technology 1996 ➔



Computer Aided Drafting Design


Continuous Flow Technology 2003 ➔



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West Central Biodiesel Plant



West Central's 12 million gallon capacity biodiesel plant is the first continuous-flow biodiesel plant in the United States. The biodiesel plant processes 90 million pounds of the co-ops soybean oil into biodiesel and other methyl ester products each year.



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Why Biodiesel?

- Reduce Emissions
- Operational Benefits -Lubricity
- Energy Balance
- Expanded Use of Soy Crops
- Nation's Energy Goals





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Reduce Emissions

2000: Biodiesel becomes only alternative fuel to meet EPA Health Effects Testing under the Clean Air Act


- ✓ Carbon Monoxide: 50% lower than petroleum diesel
- ✓ Particulate Matter: 30% lower than petroleum diesel
- ✓ Hydrocarbons: 93% lower than petroleum diesel



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Operational Benefits

- B2 has up to 66% more lubricity than #2 diesel
- Exceptional lubricity = longer engine injector life
- Superior engine performance compared to other alternative fuels
- Use in unmodified diesel engines
- Doesn't require specialized mechanics to service engines



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Energy Balance of Biodiesel

- Units of energy produced for 1 unit of energy consumed *

▪ Petroleum	0.88 units produced
▪ Ethanol	1.62 units produced
▪ Soy Biodiesel	3.24 units produced

* USDA

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Expanded use for Soy Crops



1 bushel of soybeans creates
1.4 gallons of pure biodiesel (B100)

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Nation's Energy Goals



Increase energy independence with
a domestically produced renewable resource

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USES FOR BIODIESEL

- U.S. MILITARY
- UNDERGROUND MINING
- SCHOOL BUSES
- HOME HEATING
- AGRICULTURAL SECTOR
- CONSTRUCTION
- MUNICIPALITY FLEETS
- FERRIES

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WEST CENTRAL®

- Engineering
- Construction
- Documentation
- Procurement
- Risk Management
- Laboratory
- Process Technology
- Training
- Marketing
- Management

- Combined resources of leaders in their industries
- Design, build and operating the largest biodiesel plants in U.S.
- Producing and marketing biodiesel since 1996
- 60 years of process engineering experience
- High quality construction expertise
- Practical processing experience
- Providing quality product specifications

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- Build turnkey biodiesel plants
- Assist in site selection
- Process design and engineering
- Construction and installation
- Computerized process controls
- Stringent process safety management

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RENEWABLE ENERGY GROUP

- Laboratory set-up
- Safety training
- Real-world production training
- Start up services
- Research and Development
- Updates on process

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MANAGEMENT



- **General Manager**
 - Manage and oversee plant administration and operations
 - Implement and oversee business plan
 - Direct, promote and coordinate personnel
 - Maintains relationships with investors
 - Includes financial and accounting systems
- **Production Manager**
 - Plan and schedule biodiesel production
 - Oversee Quality control
 - Manage all facility and equipment maintenance
 - Assist with budgeting and control labor costs and plant expenses
 - Implement processing changes, new technologies and other production projects




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PROCUREMENT

- **Chemicals**
 - Procure all basic chemical inputs needed for production, including catalyst
 - Negotiate for discounts where obtainable
- **Fats and Oils Feedstock**
 - Provide analysis and audit feed stock suppliers
 - Purchase feed stocks to meet production schedules
 - Provide transportation logistics and scheduling of feed stock deliveries

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SALES & MARKETING

- **Biodiesel**
 - Transportation and logistics
 - Market analysis of biodiesel supply & demand
 - Invoicing and accounts receivable management
 - Market access to West Central distribution channels
- **Co-Products**
 - Glycerin
 - Fatty Acid





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SUMMARY

West Central	REG
<ul style="list-style-type: none"> ■ Marketing/Procurement Value Package <ul style="list-style-type: none"> ■ National and International customer base ■ Multiple feed stock origination ■ Extensive distribution network ■ Nationally recognized brand name ■ Experience <ul style="list-style-type: none"> ■ Producing and marketing biodiesel since 1996 	<ul style="list-style-type: none"> ■ Innovative Technology <ul style="list-style-type: none"> ■ Continuous flow process ■ Continual research and development ■ Environmental systems to insure low emissions ■ Highest safety standards ■ Cost effective processes ■ Experience <ul style="list-style-type: none"> ■ Design, build and operate the largest biodiesel plants in North America



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Thank you