

BEET ENERGY

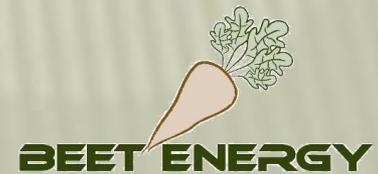
MENDOTA ADVANCED BIOENERGY
BEET COOPERATIVE

**California Energy Commission
Staff Workshop on 2010 Bioenergy Action Plan
Thursday, June 3, 2010**

UCDAVIS
UNIVERSITY OF CALIFORNIA

GOALS

- **Sustainable producer of**
 - Advanced biofuels,
 - Green-e electricity,
 - Biomethane as compressed natural gas (CNG)
 - Agricultural fertilizer products
 - Reclaimed water for crop/landscape use
- **Highly integrated biorefinery using technology and resources developed from around the world**
- **Valued contributor to local economy**



BIOREFINERY SUBSYSTEMS

- Biomass gasifier
- Advanced ethanol plant
- Anaerobic digester
- Water treatment plant



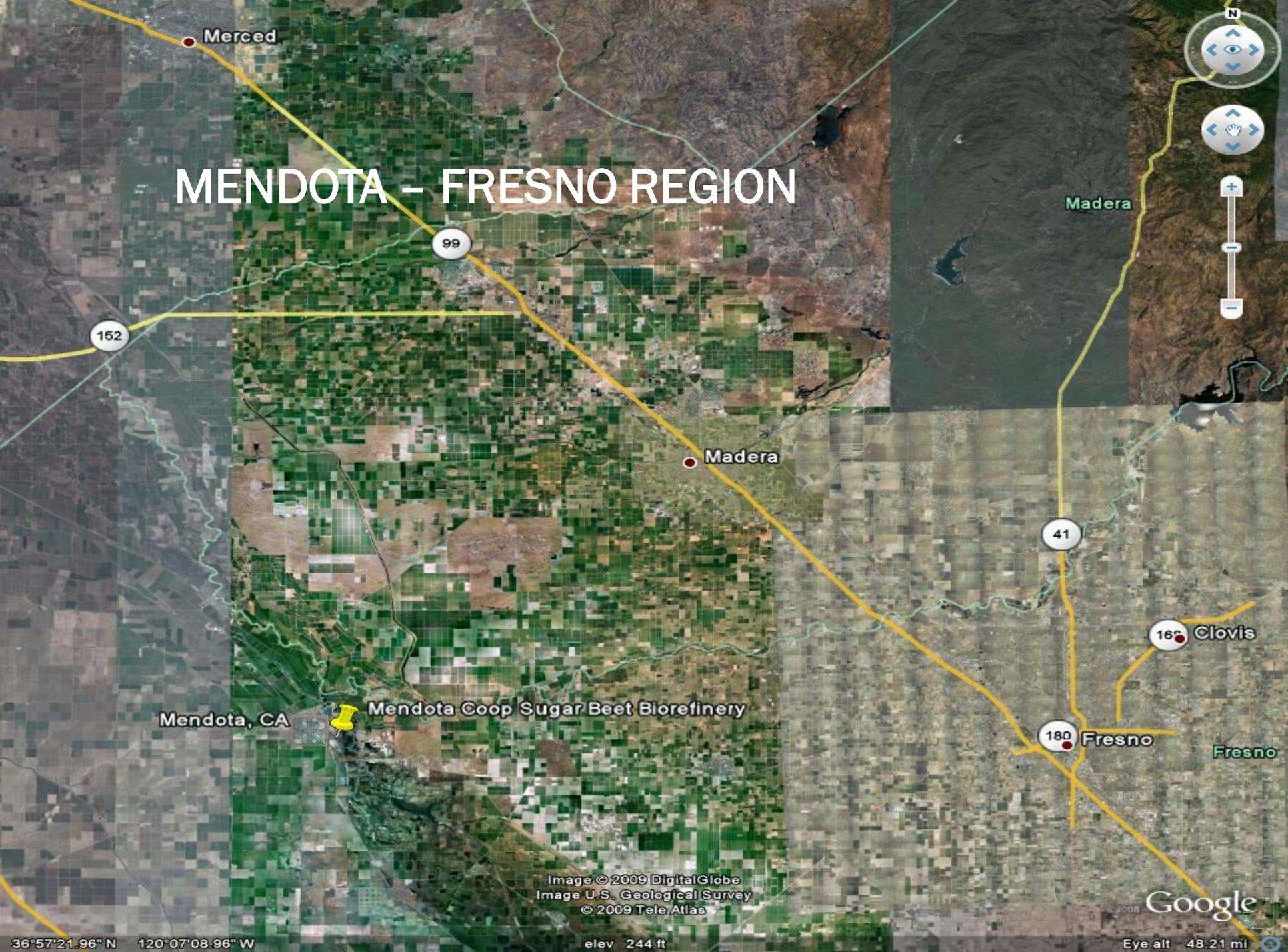
- Expected employment
 - 40-50 full time in biorefinery
 - Plus 40-50 harvest, trucking & support



PROJECT DEVELOPMENT TEAM

 Beet Energy MENDOTA ADVANCED BIOENERGY BEET COOPERATIVE		 California State University Fresno		Biorefinery Owner		Project Management Liaison	
John Diener	Board President	Dr. David Zoldoski	Director, ICWT				
Sharon Starcher	Board Administrative Coordinator	Jim Tischer	Project Consultant				
Arnold Daglia	Project Engineering Advisor	 The Grant Farm		Local, State, Federal Incentives			
Leon Woods	Government Relations	Shawn Garvey	CEO				
Joe Marchini	Counsel, Baker, Manock & Jensen	 SPECTRUM ENERGY SOLUTIONS		Energy Product Sales			
 IR1 Group		Project Developer		Mike Jennings	CEO		
Jeff Manternach	CFO	 tss consultants		Biomass Resource Evaluation			
Terry Kulesa	CEO	Tad Mason	CEO				
 UC DAVIS UNIVERSITY OF CALIFORNIA		Applied Biofuels Research		 Sustainable Conservation		Develop Sugar Beet BMP Handbook	
Dr. Ruihong Zhang	Biogas/Ethanol Production	Ladi Asgill	Program Manager				
Dr. Steve Kaffka	Sugar Beet/Biomass/Water						

MENDOTA – FRESNO REGION



Mendota, CA

Mendota Coop Sugar Beet Biorefinery

Image © 2009 DigitalGlobe
Image U.S. Geological Survey
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Google

36°57'21.96" N 120°07'08.96" W

elev 244 ft

Eye alt 48.21 mi

MENDOTA BIOREFINERY SITE

CleanTech America 40 acre 5 MW Solar Park

Covanta Energy 25 MW Biomass Plant

Mendota Coop Sugar Beet Biorefinery

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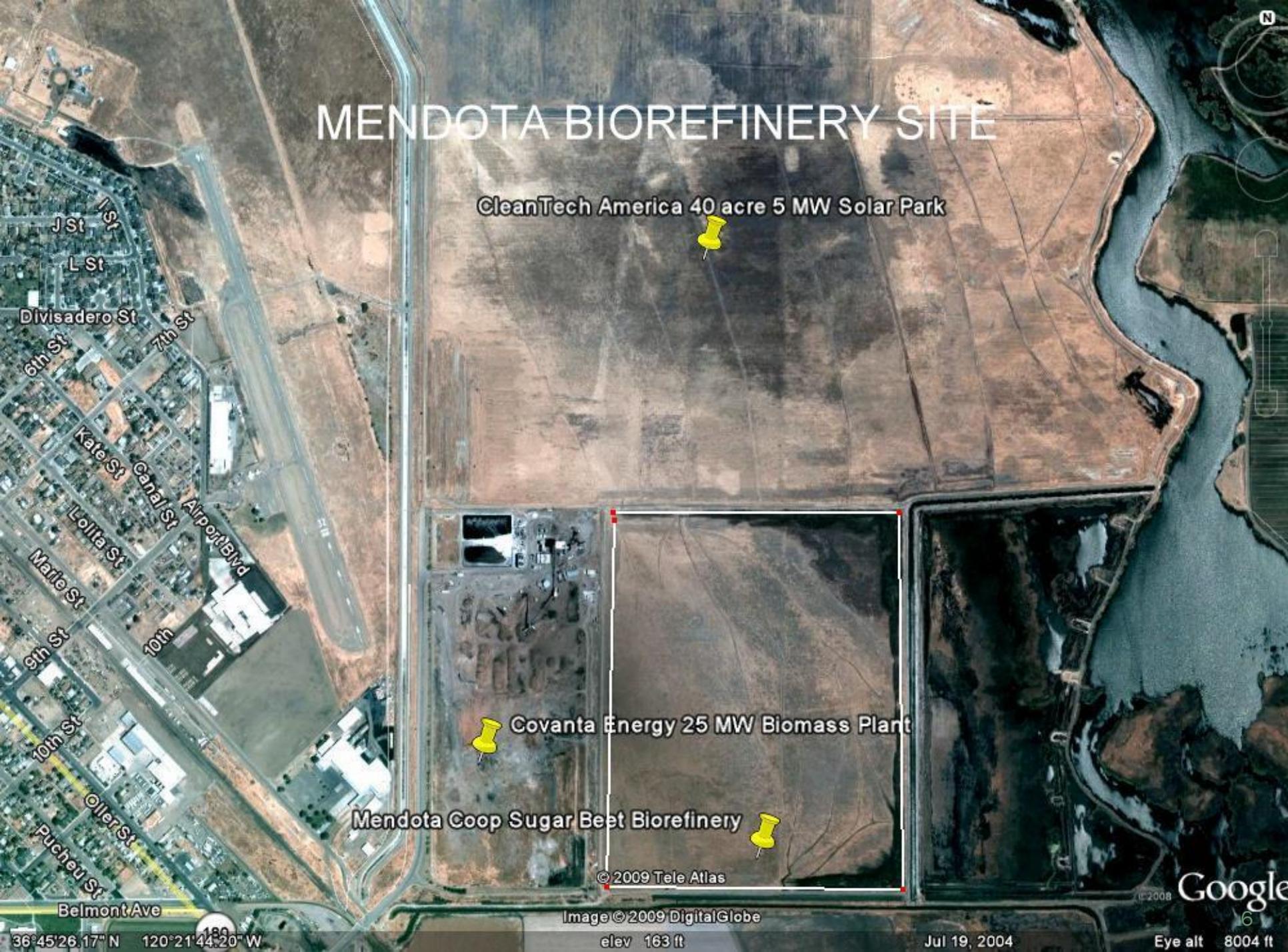
Image © 2009 DigitalGlobe

elev 163 ft

Jul 19, 2004

Eye alt 8004 ft

36°45'26.17" N 120°21'44.20" W



MAJOR BIOREFINERY METRICS



MAJOR UNITS	CAPACITY	ANNUAL PRODUCTION
Biomass Gasifier, Steam Turbine	120K lbs/hr @ 750°F	6.3 MW
Advanced Ethanol Plant	30 MM Gal/Yr nameplate	33,490,279 Gal/Yr
Anaerobic Digester	1,470 Tns/Day	537,000 Tns/Yr
Biomethane	4,900 SCF/Day	1.6 MM/MCF/Yr
MAJOR LOCAL FEED STOCKS		
Sugar beets w/in 40 miles		840,000 Tns/Yr
Almond prunings w/in 50 miles		50,000 BDT/Yr
Grain, melons, rice straw, manure, etc.		30,000 Tns/Yr
Regionally Sourced Grain available as needed		148,000 Tns/Yr
WATER BALANCE		
City of Mendota WWT Plant	+1.0 MGD (694 gpm)	+1,050 Ac-Ft/Yr
Biorefinery Water Requirements	-1.3 MGD (920 gpm)	-1,341 Ac-Ft/Yr
Biorefinery Waste Water, Treated	+ .65 MGD (450 gpm)	+656 Ac-Ft/Yr
	NET	+365 Ac-Ft/Yr

UC DAVIS RESEARCH



Sugar Beets on Research Farm

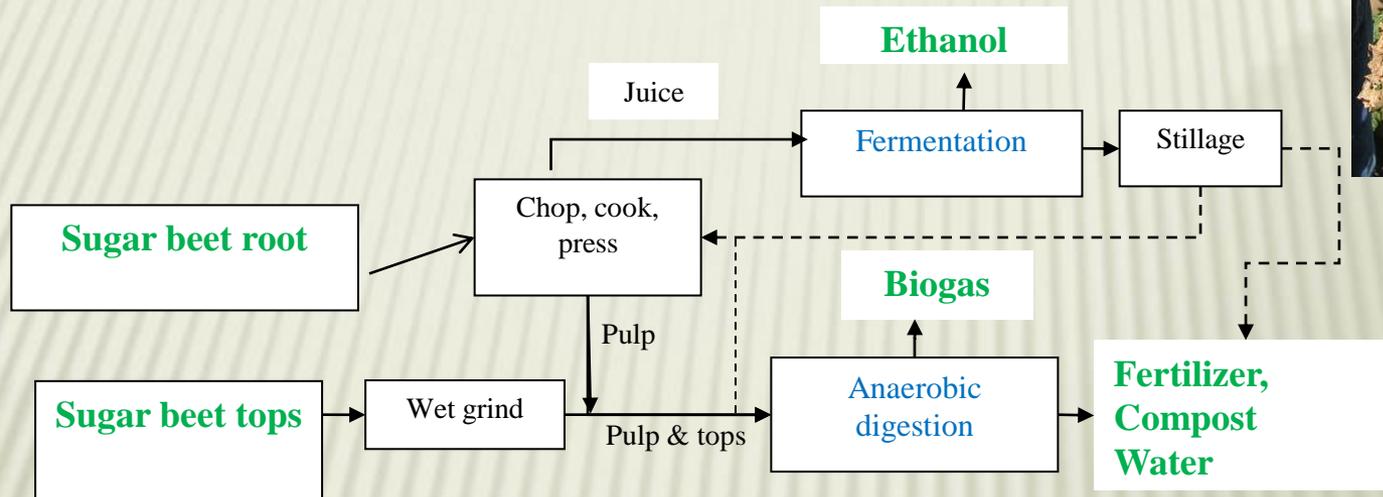


Pilot Bio-Digester Facility

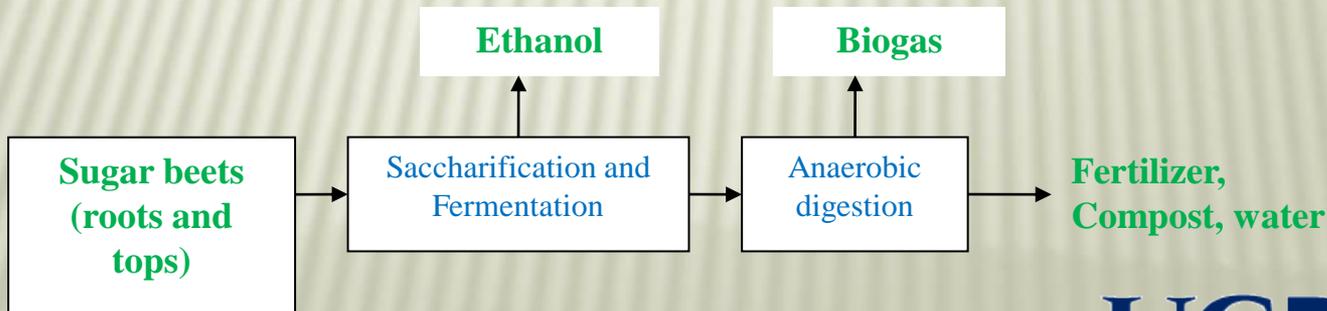
BEET CONVERSION PATHWAYS



(A)



(B)

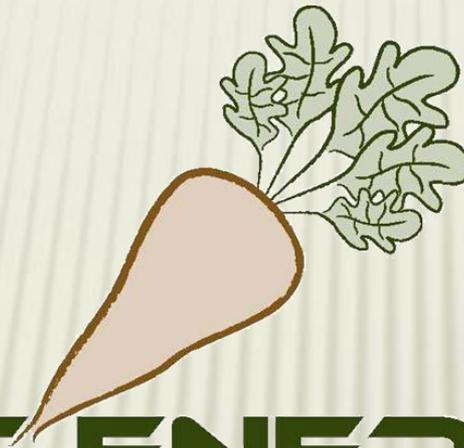


PILOT FACILITY TESTING

- Existing Facility for Anaerobic Digestion
 - whole beets, beet tops and pulp
- Modified facility for ethanol fermentation
 - Beet fractionation equipment (juice and pulp separation)
 - Ethanol recovery equipment



QUESTIONS?



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