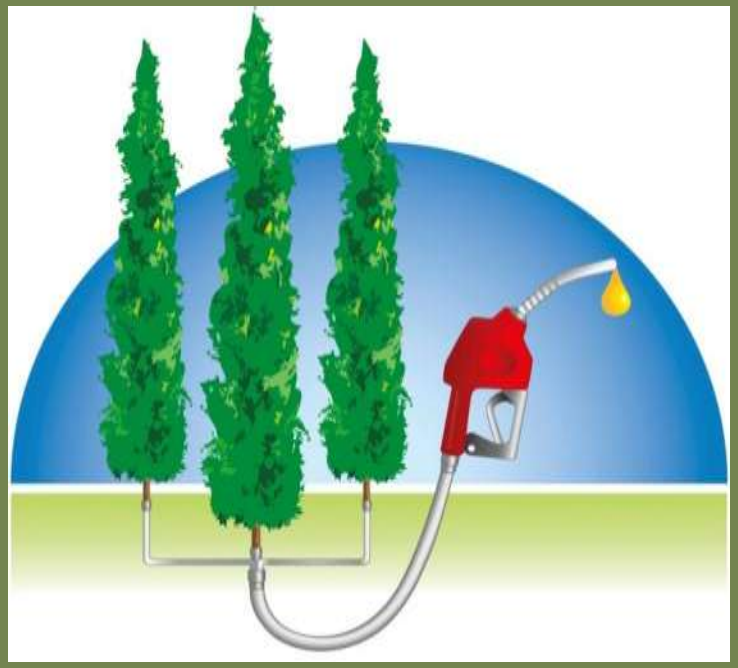
UNIVERSITY OF WASHINGTON

Bioresource Research at UW



Biofuels and Bioproducts Laboratory
University of Washington School of Enviromental and Forest Sciences
BBL

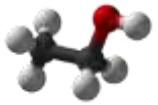
Rick Gustafson
School of Environmental and Forest Sciences
pulp@uw.edu

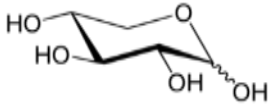
What We Do!

Biomass

Useful Stuff

Biological conversion





Chemical conversion

Thermal conversion

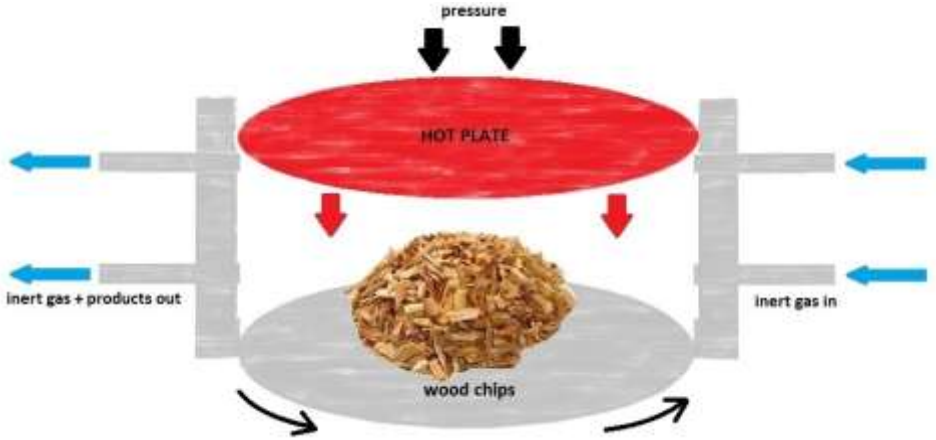
Economics, Environment (Carbon & Water), Social

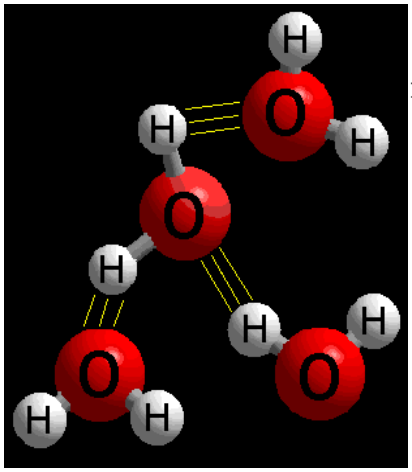
How to deal with heterogeneous biomass? (Renata Bura – Session B2, 11:15)

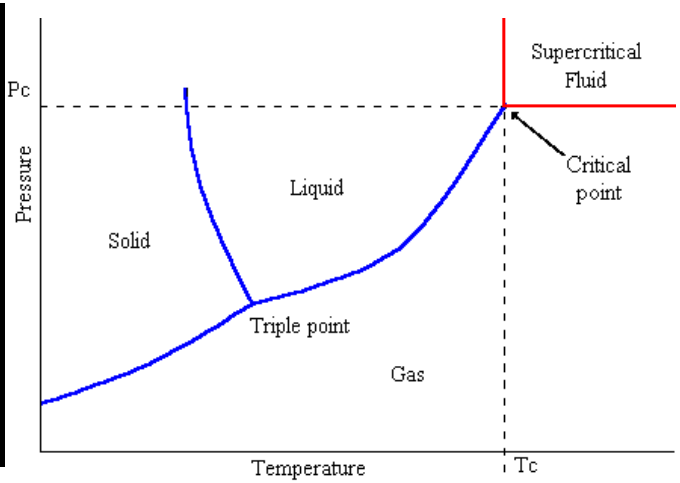
1. Preconditioning
2. Online reaction control
3. Techno-economical analysis
4. Life Cycle Analysis (LCA)

Thermochemical/Hydrothermal Conversion of Biomass (Fernando Resende – Session B3, 1:30)

- ✓ Ablative Pyrolysis of Beetle-killed Trees
- ✓ Catalytic Fast Pyrolysis for Drop-in Fuels

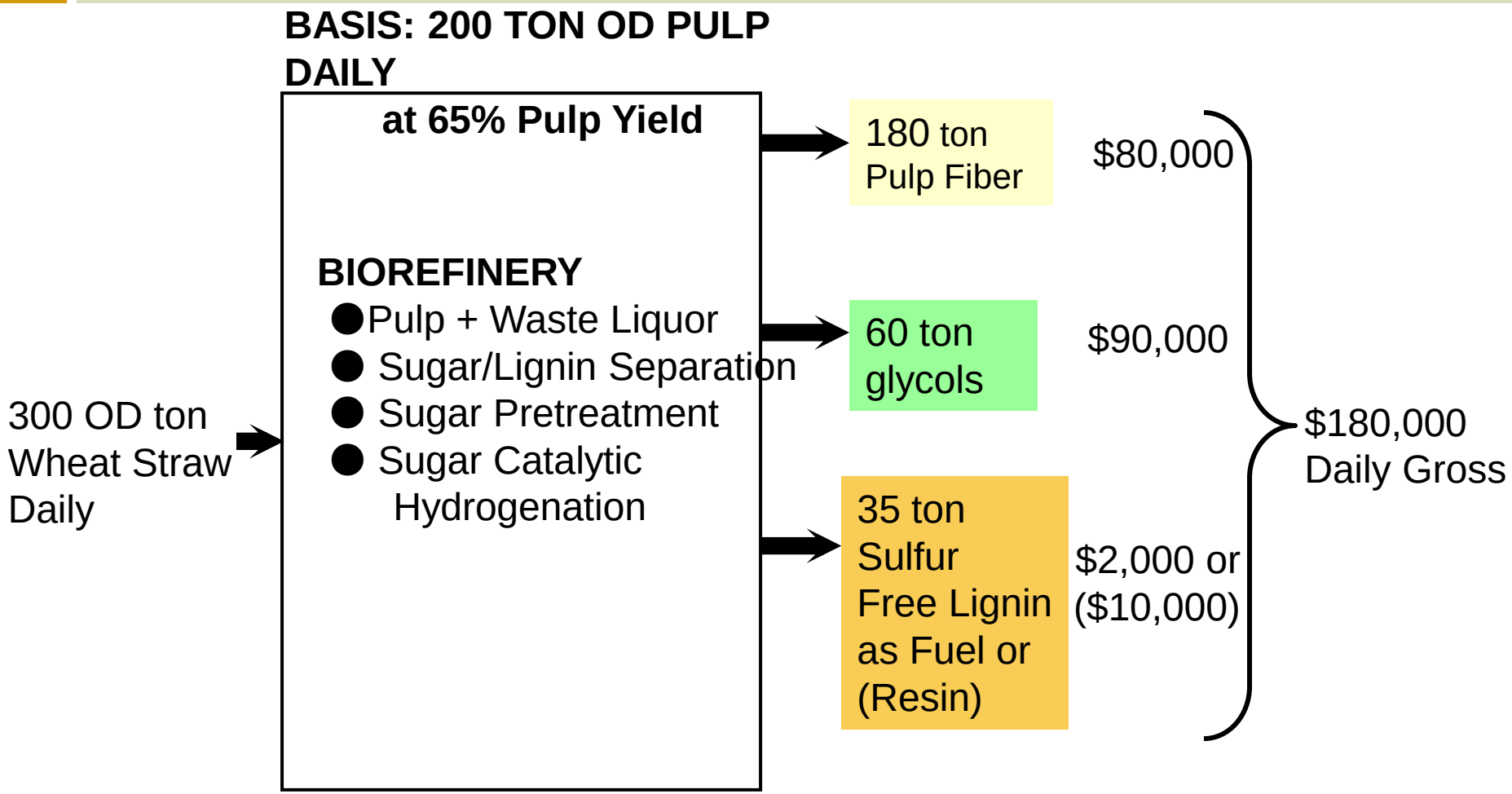






- ✓ Hydrothermal Gasification/Liquefaction of Biomass
- ✓ Conversion of Ethanol to Gasoline/Jet-fuel

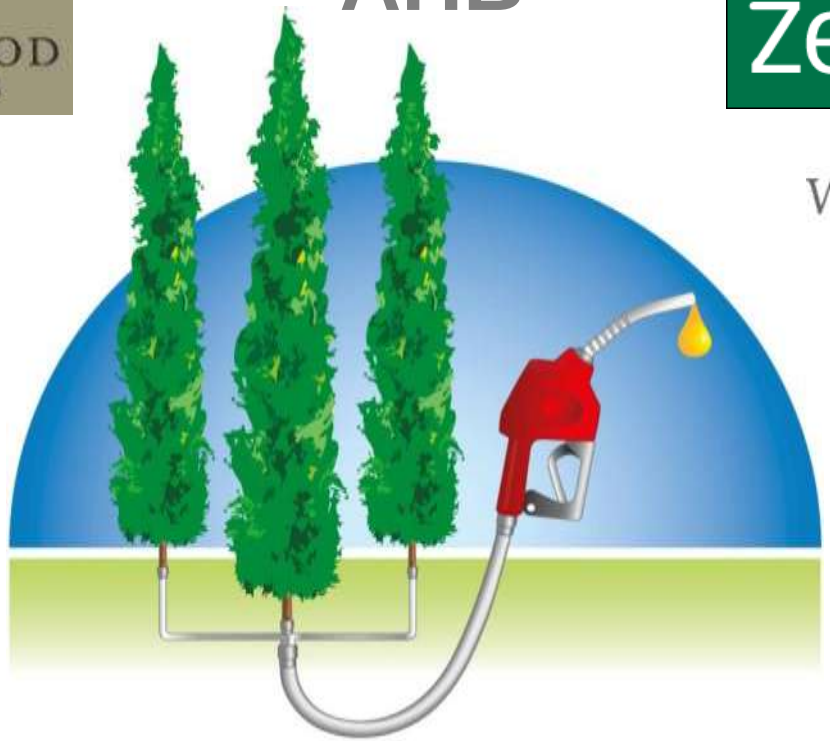
Biorefinery Process Development – Pulp+Chemicals (Bill McKean – Plenary Session 4, 3:00)



Advanced Hardwood Biofuels Northwest AHB

GreenWood Resources

ZeaChem



Washington State University Extension

Washington State University

Agriculture Center of Excellence

UC Davis University of California

Oregon State University OSU

University of Idaho

Institute of Transportation Studies

USDA NIFA

The National Institute of Food and Agriculture

University of Washington

Preparing PNW for Biofuels Industry

5 million tons biomass/yr
400,000 acres in production
- Poplar-industrial growers
- Poplar-farmer-based partnerships
- Local residuals

Sustainable system
- Environmental
- Economic
- Social

1500 direct employment
– most in rural areas

Vigorous Extension

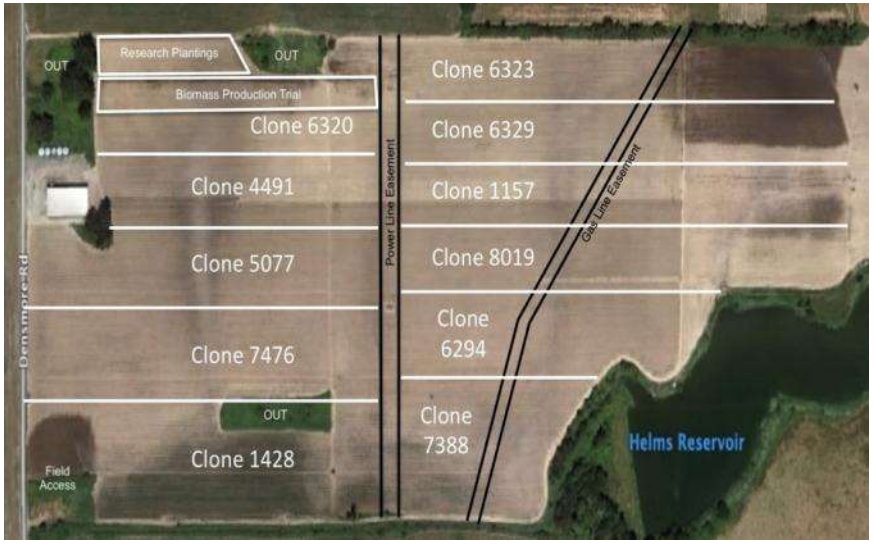
Comprehensive Education

400 million gallons/yr
(75% of pro-rata PNW RFS2 for 2022)
100% infrastructure compatible biofuels

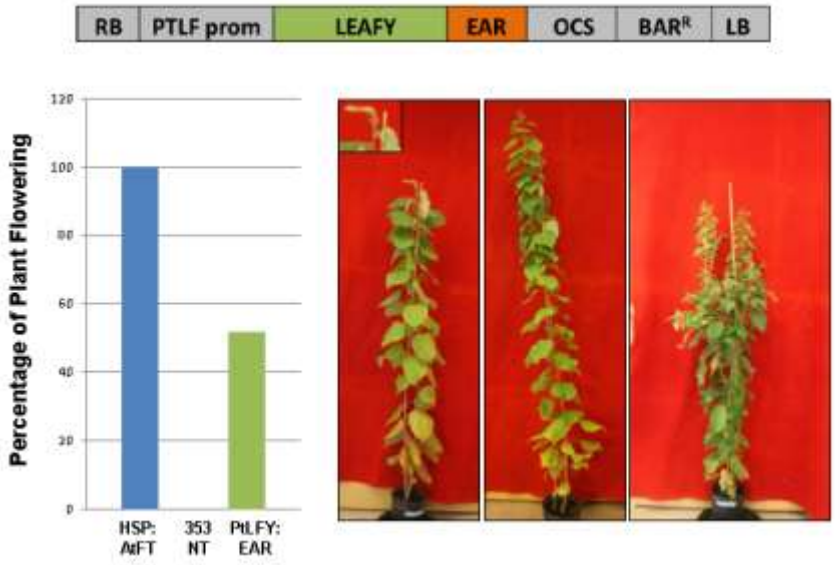
Feedstock – Trial Plantations

Feedstock Supporting Research

Clonal Performance



Sterile Poplars

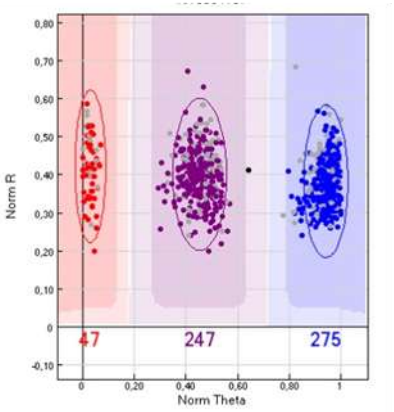


Phenotyping

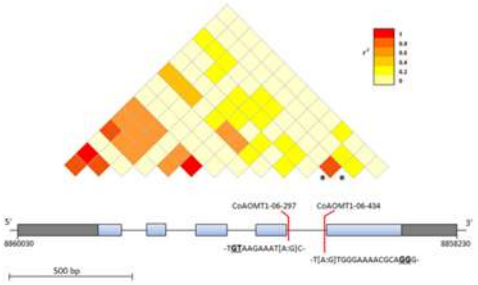
Traits related to:
Growth and phenology
Water use efficiency
Wood chemical composition
Wood metabolome

+

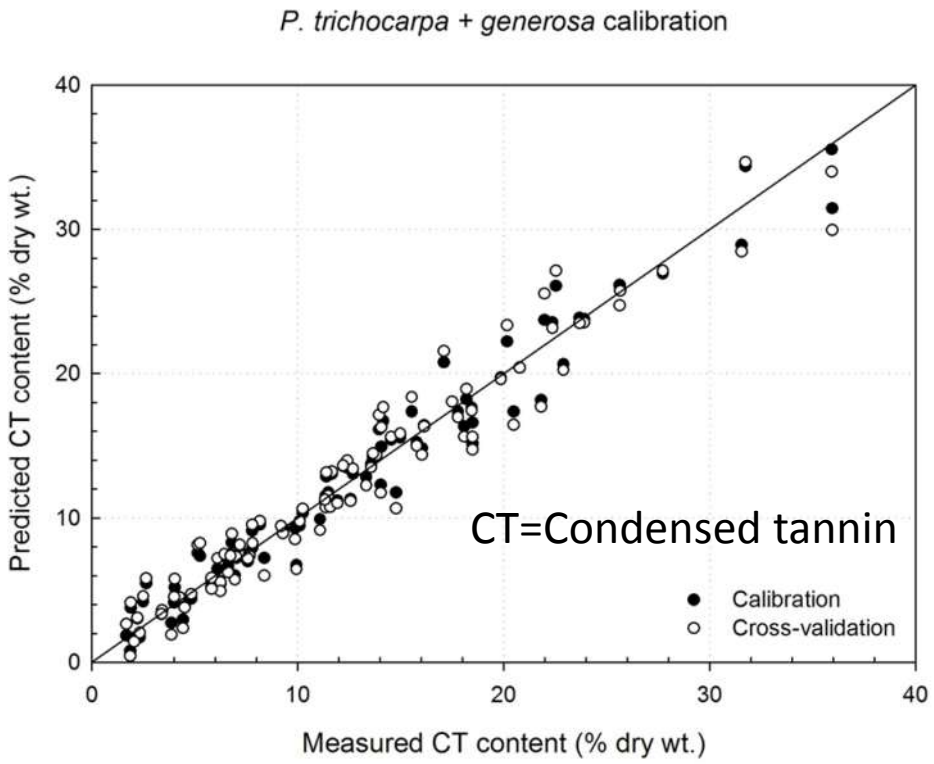
Genotyping



Association analysis

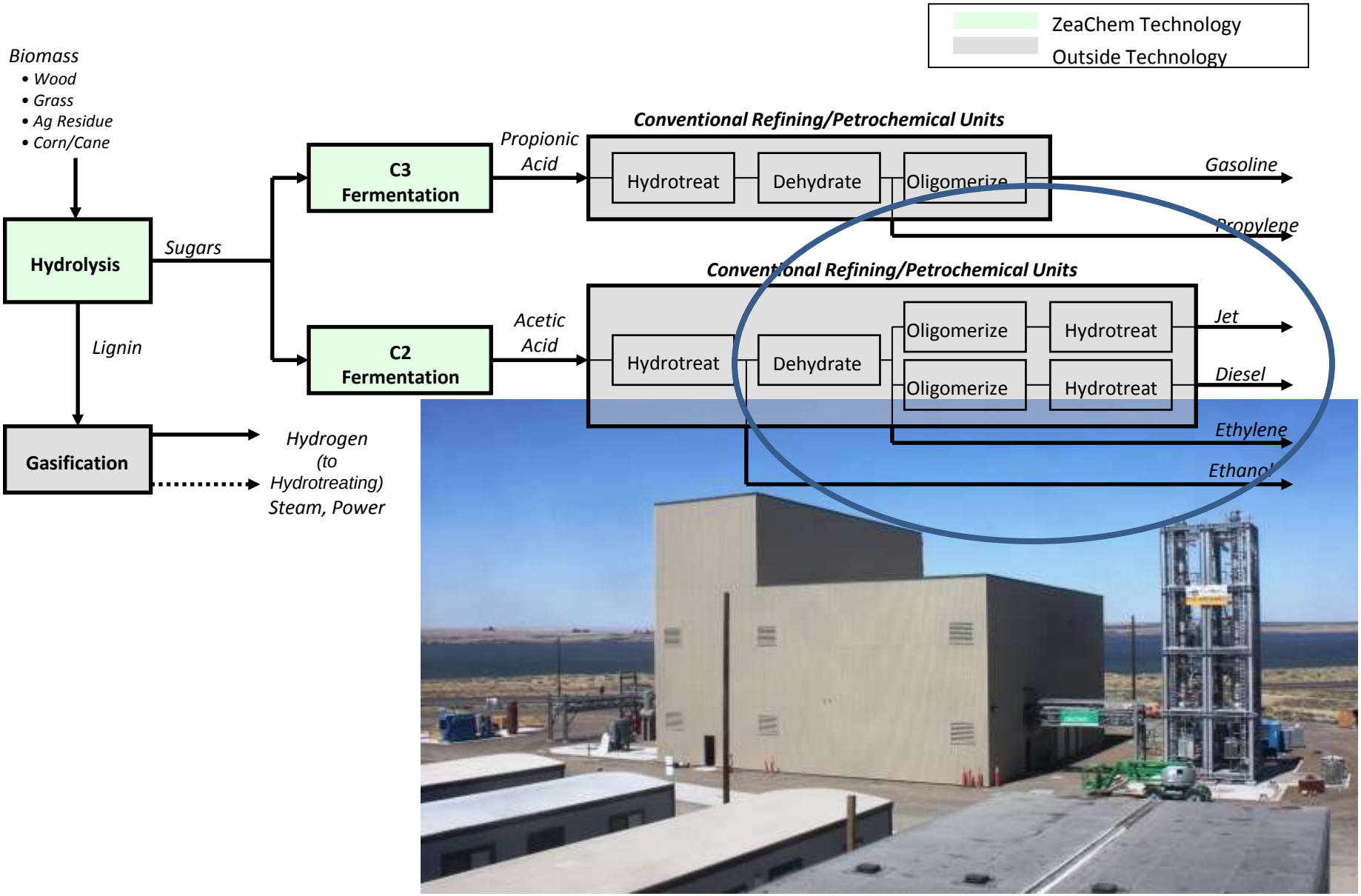


Feedstock - Supporting Research

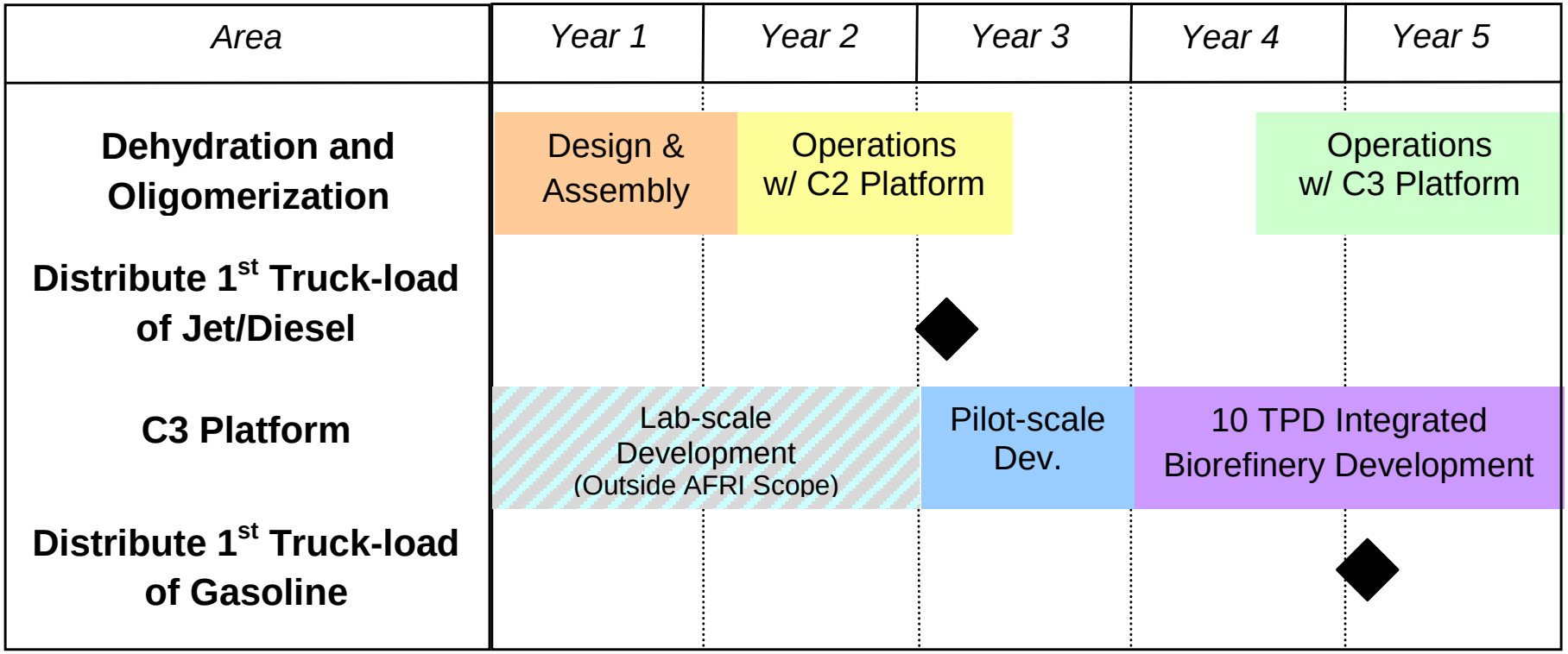


Control **Leaf Endophytes**

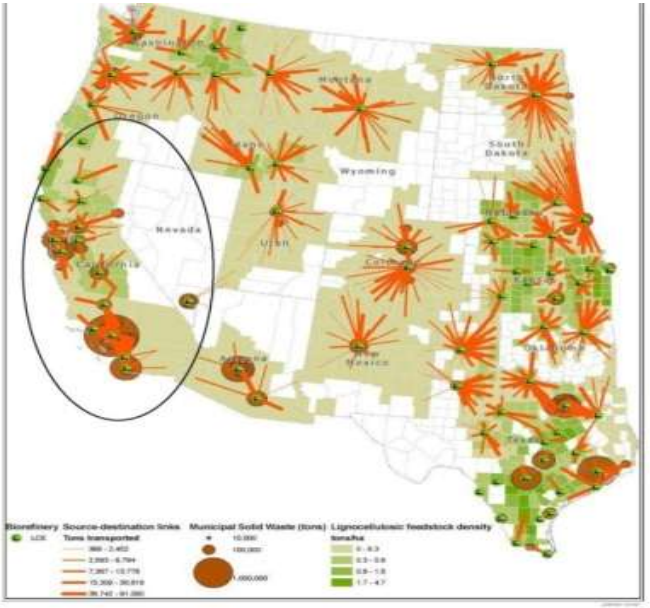
Conversion - ZeaChem Process

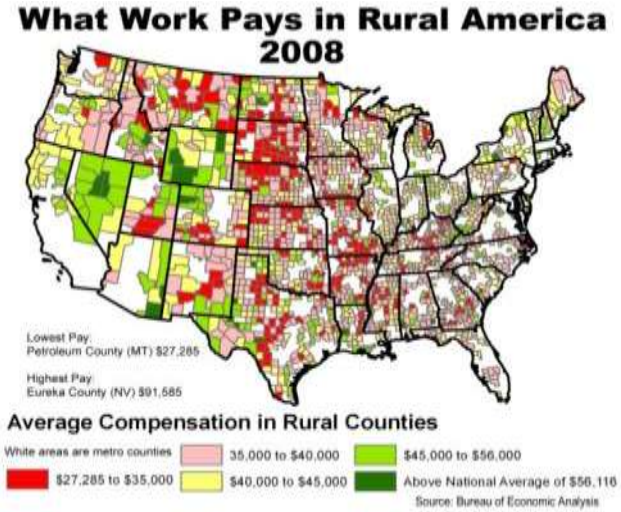


Conversion – Project Schedule

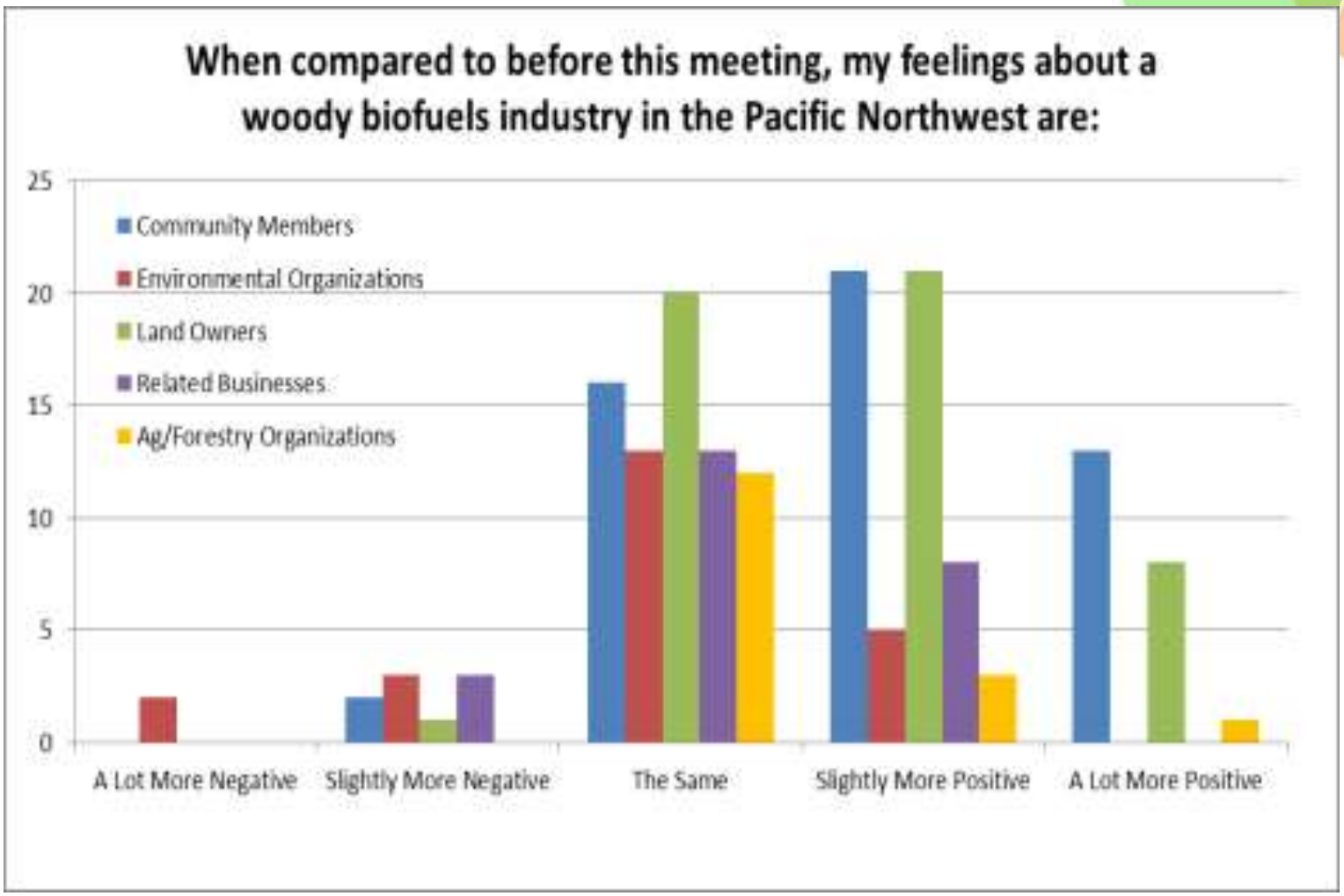


Sustainability

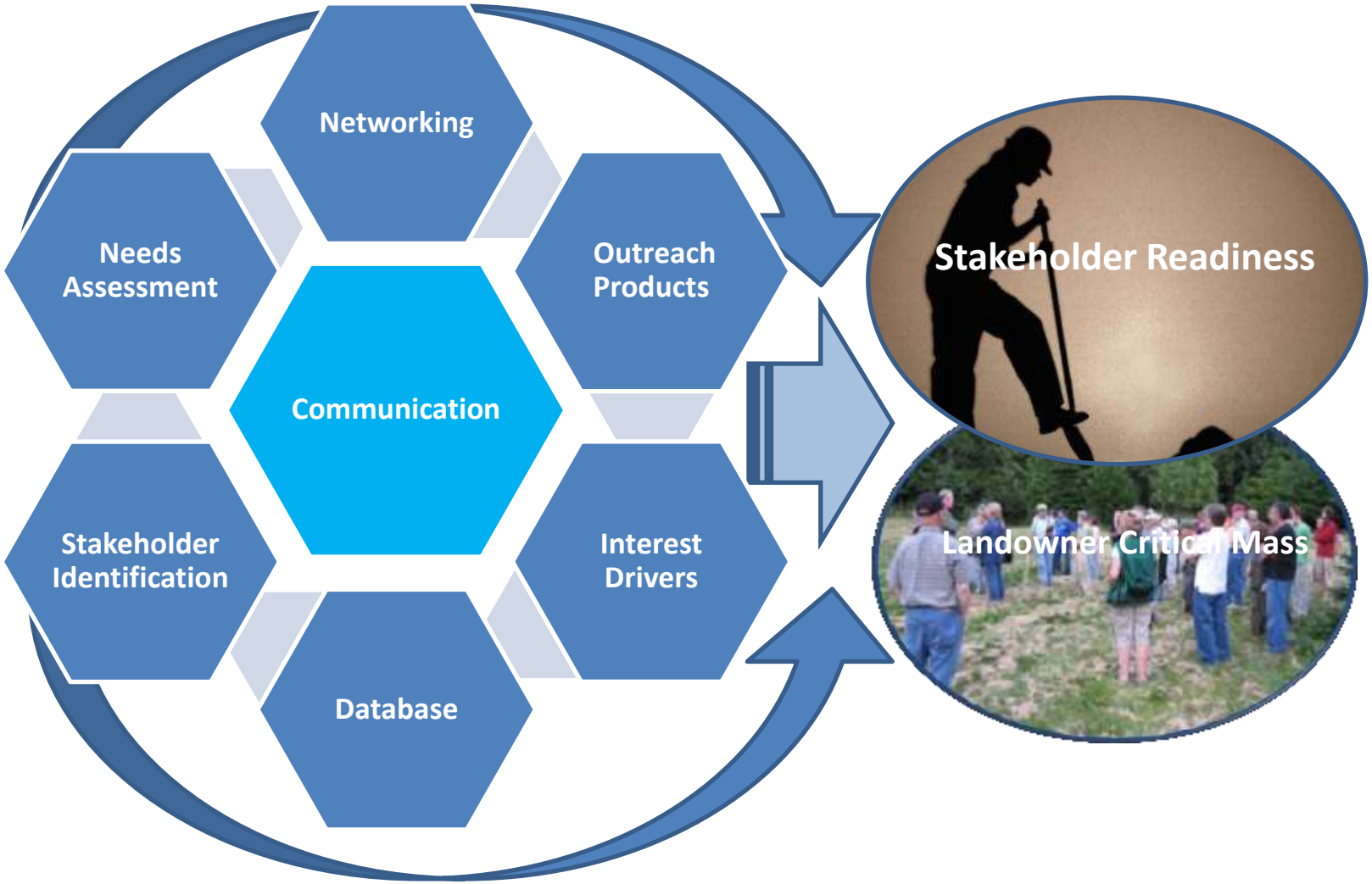




Sustainability

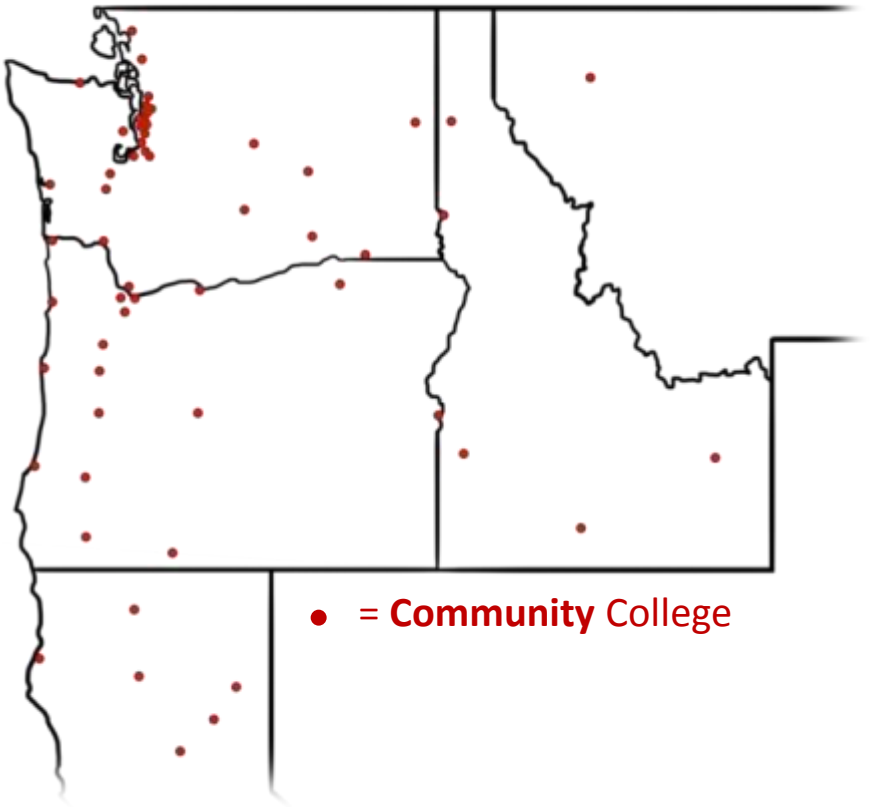


Extension


Networking
Needs Assessment
Outreach Products
Communication
Stakeholder Identification
Interest Drivers
Database
Stakeholder Readiness
Landowner Critical Mass

Education

Community College Curriculum Development (DACUM) sessions:



Acknowledgements

Funded by a grant from USDA NIFA Regional CAP program

USDA NIFA

The National Institute of Food and Agriculture