hardwoodbiofuels.org

Advanced **Hardwood Biofuels** Northwest

The Dual Benefits of Poplar in the Pacific Northwest: Sustainable Feedstock and Wastewater Management

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Feedstock | Conversion | Sustainability | Education | Extension

USDA United States Department of Agriculture | National Institute of Food and Agriculture

Today's talk

- About AHB
  - Renewable fuels and chemicals
  - Poplar biomass
- Challenges
  - Price of oil
  - Growers
- Solutions
  - Connect with stakeholders
  - Environmental services
  - Bio-based chemicals
- Road ahead

Overview of AHB

Pacific Northwest Grown
Short Rotation
Hybrid poplars

Cellulosic Ethanol,
Biochemicals, and Drop-in
Replacement
Transportation Fuels

USDA United States Department of Agriculture
National Institute of Food and Agriculture

Renewable Fuels and Chemicals

Renewable Transportation Fuels

- Cellulosic Ethanol
- Drop-In Biofuels
  - Bio-Jet Fuel
  - Biogasoline
  - Renewable Diesel

Biochemicals

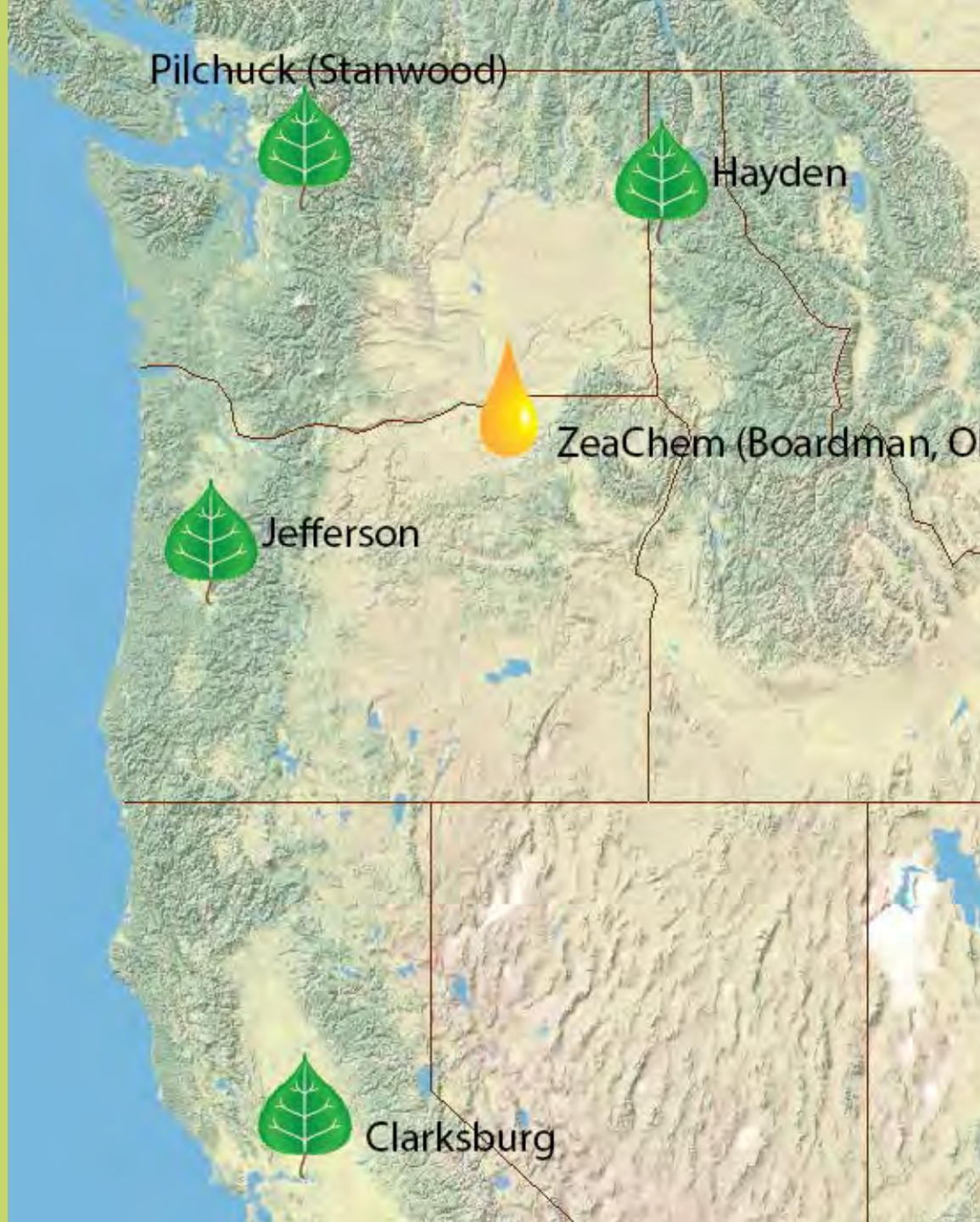
- Acetic Acid
- Ethyl Acetate
- Ethylene

Poplar Bioenergy Crops

- Ideally grown
  - Non-irrigated
  - On marginal land
  - Near other feedstock sources

AHB Demonstration Sites

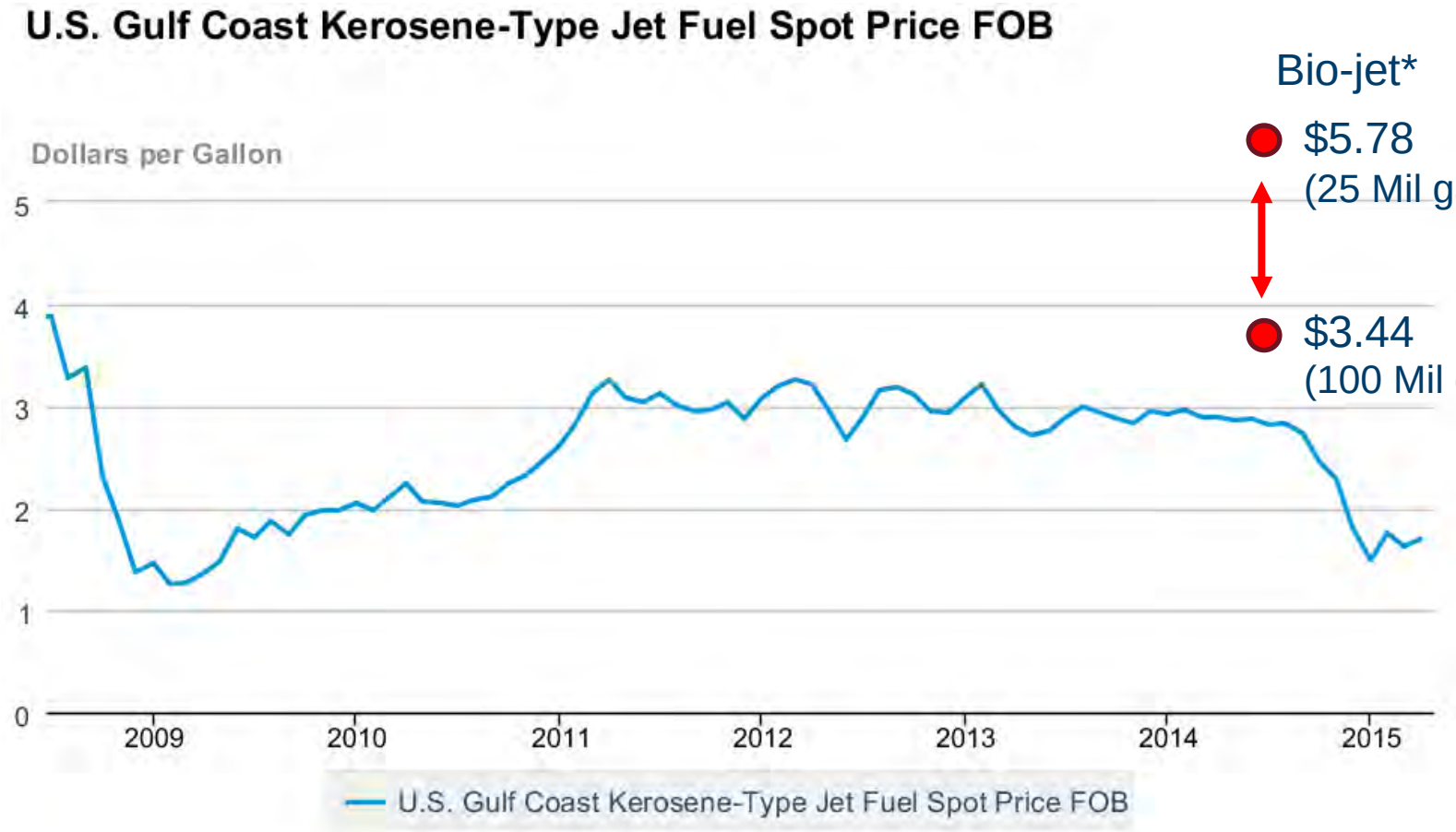
- Four farms, 50 to 100 acres each.
- Alluvial plains and Cascade range piedmont sites
- Level terrain up to 10% slope
- 18 to 45 inches precipitation
- Clay, clay loams, silty loams



Harvesting Poplar

Coppiced Poplar Production

Challenge 1: Economics



Bio-jet*

$5.78
(25 Mil gal year)

$3.44
(100 Mil gal year)

*7% discount rate and $80 per dry ton feedstock

Challenge 2: Interest in Bioenergy

- 50% are interested in bioenergy crops
- 33% likely to grow a bioenergy crop in next 5 yrs
- Significantly correlated with profit, risk, water quality, and renewable energy interest

Solution 1: Connect with Stakeholders

Field tours – An excellent way to reach local policy makers

Annual Field Tours

Summer 2016 tours

- Clarksburg, CA May 10
- Jefferson, OR May 15
- Pilchuck, WA May 31
- Hayden, ID June 7

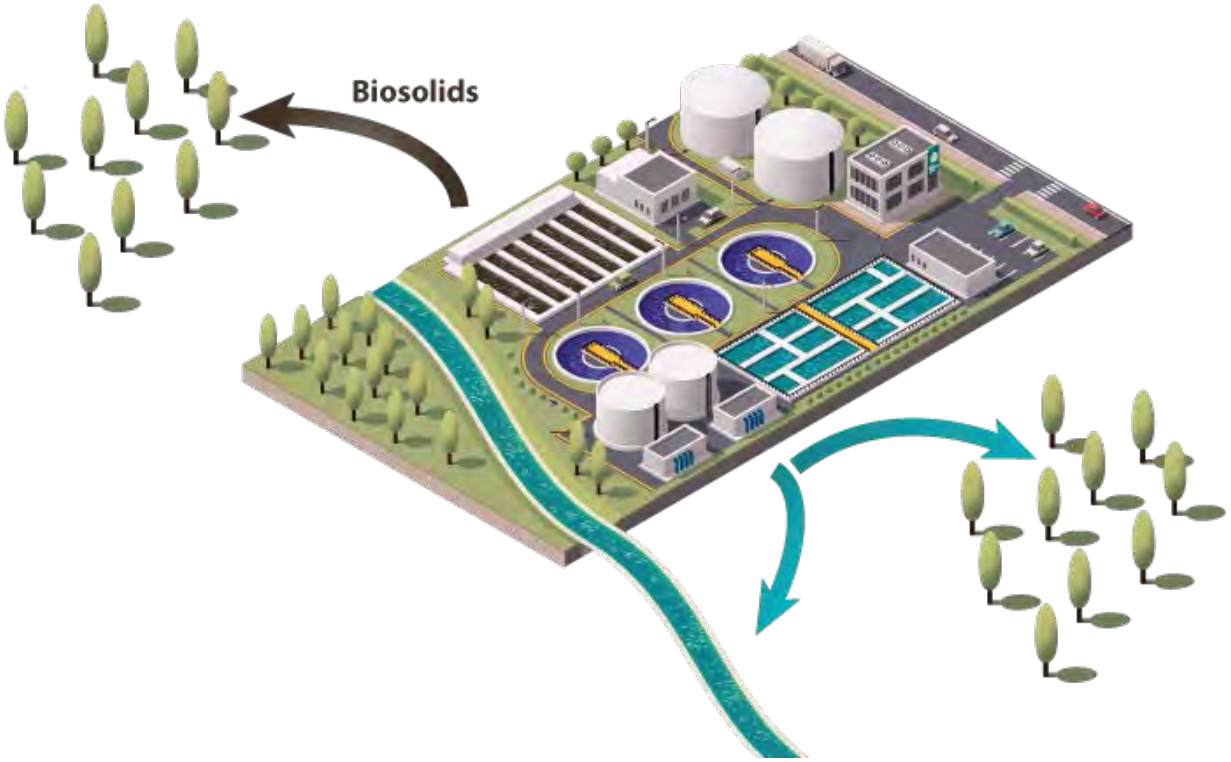

Jefferson, OR 2013

Solution 2: Environmental Co-products

Poplar for Environmental Uses

Biocycle Farm in Eugene, OR. Nearly 400 acres of poplars fertilized with biosolids and irrigated with recycled wastewater.

Multiple Benefits



- Reduces wastewater treatment costs
- Keeps natural waterways clean
- Enhances poplar growth
- Produces a marketable crop

VIDEO: https://youtu.be/zlH-L3jfFmw

Other Environmental Uses

- Phytoremediation
- Riparian Buffer
- Riparian zone protection
- Slope stabilization
- Flood reduction
- Carbon sequestration
- Aquaculture effluent management
- Restore degraded land

Pacific Northwest Poplar

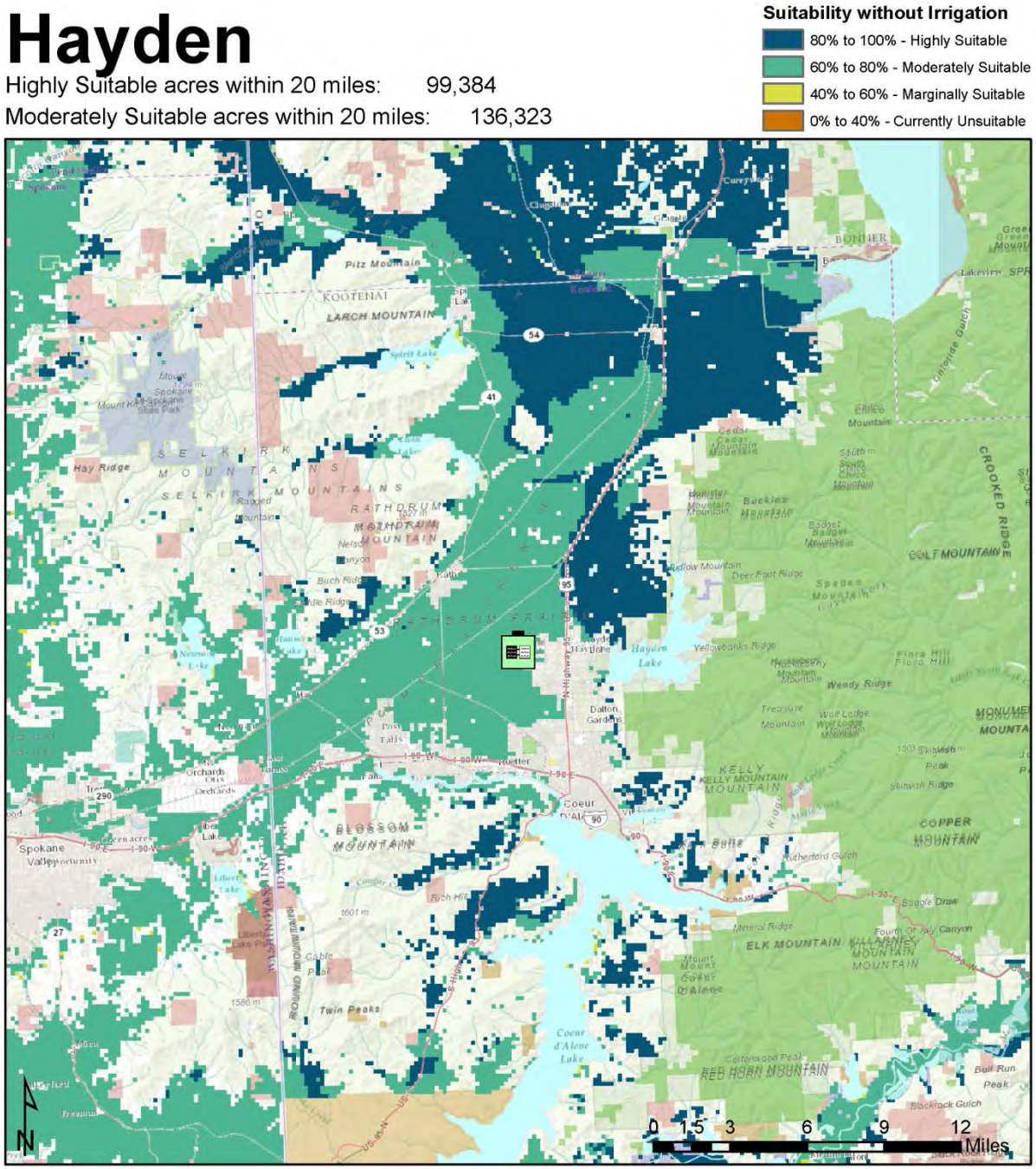
Phytoremediation project at the Riverbend Landfill in McMinnville, OR.

Erosion control project near Mt. St. Helens.

Land Suitability Study

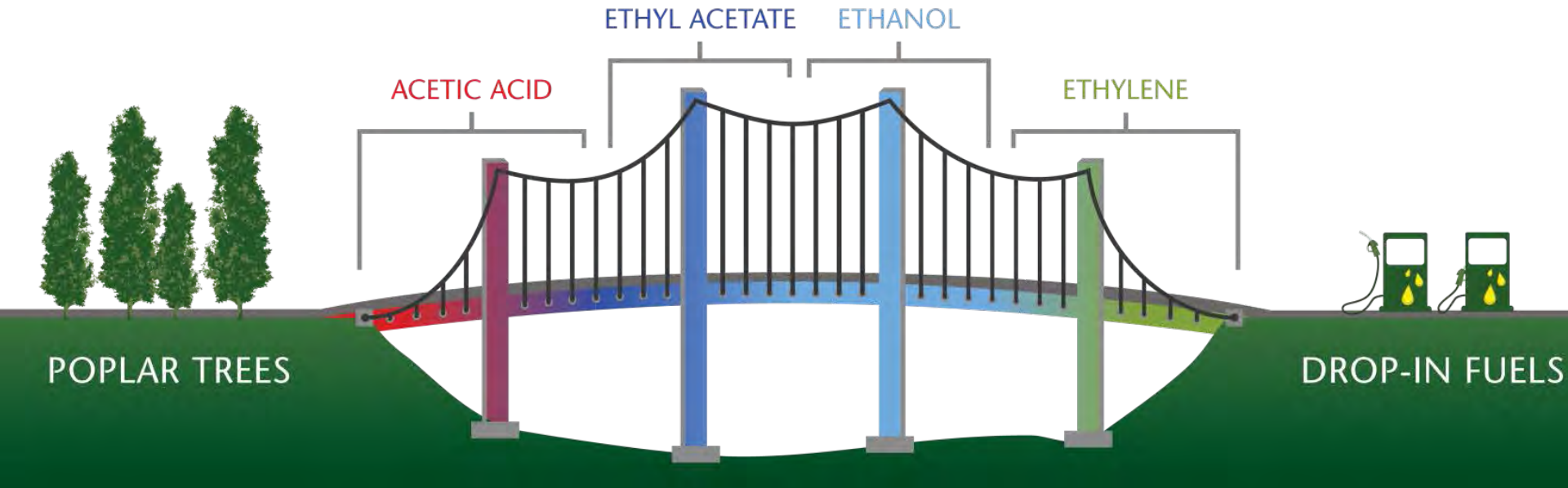
University of Washington

http://nrsig.org/projects/advanced-hardwood-biofuels-northwest



Solutions 3: The Bridge to Biofuels

- Biofuels industry currently in holding pattern
- In the meantime
  - Looking to other products (cellulosic ethanol and acetic acid)
  - AHB is preparing to support future industries and early-adapters of hybrid poplar bioenergy crops



Poplar and Willow Roadmap

- Benefits
- Barriers
- Potential
- Solutions

NEWBio

IBSS

AHB Concluding thoughts

- Biomass
  - Biofuels
  - Co-products
  - Wood products integration
- Solutions
  - Wastewater management
  - Land Reclamation
  - Riparian buffers
- Road ahead

WE love poplar!

About AHB

Connect with AHB

Get Involved

AHB Funding

Questions & Answers

Get Involved

Please complete this short questionnaire so that we are able to understand how you would like to be involved with AHB.

1. **Which of the following best describes you?**

Select...

2. **What interests you?** (please select all that apply)

Growing biofuel feedstock
Economic development in your community
New business opportunities
Educational opportunities

(shift-click or command-click to select more than one item)

3. **Would you like to receive our quarterly email newsletter?**

Yes

4. **How do you prefer to receive information?** (please select all that apply)

Newsletters
Printed publications
Online publications
Workshops

(shift-click or command-click to select more than one item)

Questions……