Making Sustainability the Standard:
Biopolymers and Sustainable Agriculture

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Promoting resilient family farms, rural communities and ecosystems

- **Environment and Agriculture**
- **Food and Health**
- **Rural Communities**
- **Trade and Global Governance**
- **Community Forestry Resource Center**

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Promise of a Sustainable Bioeconomy

- **Reduced fossil fuel dependence and GHG emissions**
- **Safer products and processes**
- **Environmental, biodiversity, health and climate benefits**
- **New and stable farm markets, rural community and economic development**

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Challenges for a Sustainable Bioeconomy

- **Current feedstock limits and impacts**
- **Refining and end-of-life concerns**
- **Making the transition to biomass sustainably**
- **Ownership, scale and community considerations**

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The Fuel of Today's Bioeconomy

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What We Put In to Corn…

- Average of over 120 lbs. Nitrogen fertilizer per acre
- Among the highest levels of pesticide and herbicide use for conventional crops
  - 2/3 of corn acres are treated with atrazine
- GM varieties increasingly used (>60% of MN corn acres)

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…And What We Get Out

From One Bushel of Corn (56 pounds)

1.6 Pounds of Corn Oil
Cooking Oil, Margarine, Mayonnaise, Salad Dressing, Shortening, Soups, Printing Ink, Soap, Leather Tanning

AND

13.5 Pounds of 21% Protein
Gluten Feed, Livestock & Poultry Feed, Pet Food

AND

2.6 Pounds of 60% Gluten Meal
Amino Acids, Fur Cleaner, Poultry Feed

AND

32 Pounds of Starch
Adhesives, Batteries, Cardboard, Crayons, Degradable Plastics, Dyes, Plywood, Paper, Antibiotics, Chewing Gum

OR

33 Pounds of Sweetener
Shoe Polish, Soft Drinks & Juices, Jams and Jellies, Canned Fruit, Cereal, Licorice, Peanut Butter, Pickles, Catsup, Marshmallows

OR

2.7 Gallons of Ethanol/Alcohol
Motor Fuel Additive, Alcoholic Beverages, Industrial Alcohol

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But What Else is Produced?

- Soil erosion and nutrient run-off and leaching
- Water, air, health and wildlife impacts of chemical use
- Risk to biodiversity from GMOs
- Pressure on alternate land uses
- Consolidation of input suppliers and buyers
- Reduced rural economic benefit from agricultural production

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Why Grow So Much Corn?

- Cropping decisions and farming practices are driven largely by economics
- Agricultural economics are determined by policy and markets
- Change requires support in *both* markets and policies

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It can be different!

Commodity crop production can be more sustainable

But markets and policies need to support it

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Perennial crops are the future

Grasses, trees, and crop and forest residues are the "next generation" feedstocks

- Reduced need for inputs
- Improved water and soil quality
- Enhanced wildlife habitat and carbon sequestration

But markets, policies and *infrastructure* are needed

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Making Sustainability a Standard

- **Sustainability as agricultural policy**
- **Support for sustainable agriculture in the market**

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Conservation Security Program

- "Reward the Best, Incentivize the Rest"
- Pays for environmental stewardship on working lands
- Current appropriations do not allow for nationwide implementation
- Payment schemes need to be at level to support sustainable practices

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States Leading the Way

MAINE

Economic Development & Green Chemistry Alliance for a Clean & Healthy Maine

- partnership of Green Harvest Technologies, Interface Fabrics, the University of Maine and the Maine Environmental Health Strategy Center
- researching the viability of building a PLA factory in Maine using "waste" potatoes and other agricultural and forestry waste products.

New York, Washington, Massachusetts, Michigan also pursuing biobased initiatives

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Working Landscapes Certificates

- Allow for separation of commodities and agro-environmental services
- Enable customers and retailers to support equivalent amount of sustainable crop production for current commodity use
- Do not require “identity-preserve” infrastructure and additional transaction costs

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Making the Market Sustainable

Companies can support sustainable agriculture by:

- working with NGOs to promote more sustainable bioplastic materials
  - Business-NGO Working Group on Safer Chemicals and Sustainable Materials
  - Working Landscape Certificates
- Following guidelines for sustainable supply-chain
  - "Sustainable Bioplastic Master Guidelines"

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WLC Corn Production Criteria

- No GMO varieties
- No continuous cropping
- Required soil testing and fertilization according to state criteria and test results
- No use of known human or animal carcinogenic chemicals
- Use of cover crops or at least 30% of residues remain on entire field
- Creation of whole farm plan that includes biodiversity and energy information

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Immediate Goals

- Farmers receive a higher price for sustainable production
- Growth of markets for sustainable products
- Begin movement towards perennial biomass feedstocks

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IATP Sustainable Biomass Standards

- Focus on perennial grasses, crop residues, forest biomass and other likely feedstocks
- Verify crop production that meets ecological, social and economic goals
- Can be linked to existing and future “green” payment programs

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Overarching Goals for the Bioeconomy

- Benefits family farmers, rural communities and the environment
- Provides new markets, good jobs and healthy products
- Develops and operates fairly and is responsive to societal concerns

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THANK YOU!

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