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Office of Energy Policy and New Uses**

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# **USDA Role**

**Harry S. Baumes, Ph. D.**

**Director**

**Office of Energy Policy and New Uses**

**Farm to Fleet Industry Day**

**South Building**

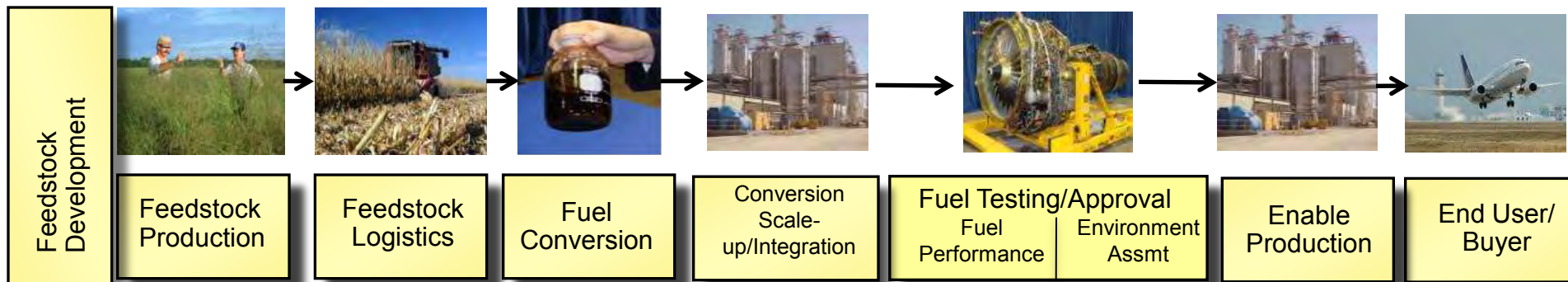
**Washington, DC**

**January 30, 2014**



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# Supply Chain Approach for Alternative Jet Fuels



Feedstock Development & Production  
Research and Education

Feedstock pathways – Integration - Scale Up  
Commercial Production

End –Use  
Alternative Fuels



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## **USDA Research Efforts**

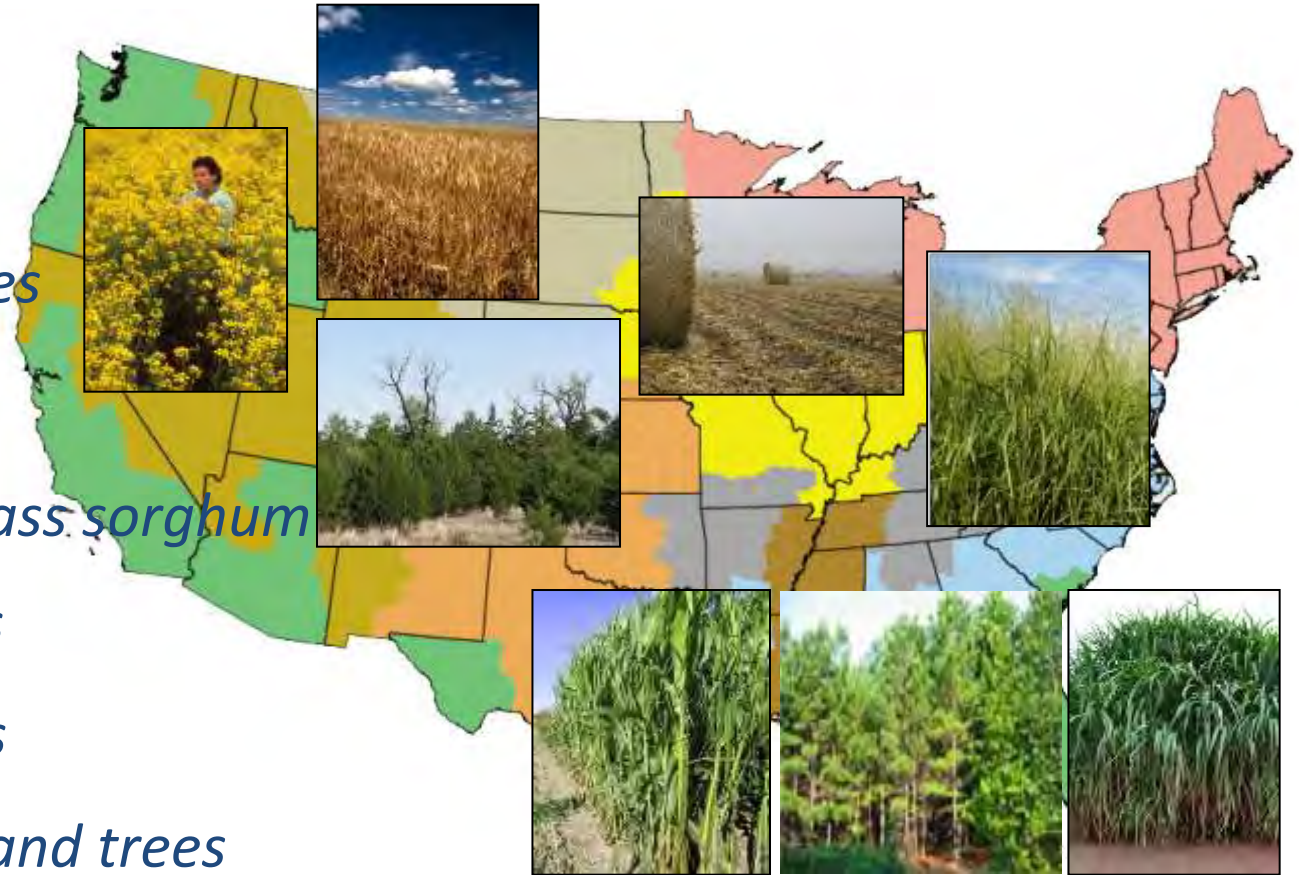
- **Research**
  - **5 Biomass Research Centers (ARS and FS Leadership)**
  - **National Institute of Food and Agriculture (NIFA)**
    - **Integrated research, education, Extension/tech transfer**
      - **Agricultural Food and Research Initiative (AFRI) – Regional Bioenergy Systems Coordinated Agriculture Projects(CAPS)**
- **Collaboration with EPA**
  - **RFS Volumes**
  - **Feedstock Pathways**



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## Concentrate on Specific Regional Feedstocks

- *Crop residues*
- *Perennial grasses*
- *Energy cane*
- *Non-food biomass sorghum*
- *Lipid seed crops*
- *Woody Biomass*
- *Invasive rangeland trees*



*No one feedstock will meet all national biofuel needs*



## USDA Research Efforts

- **AFRI – CAPs**

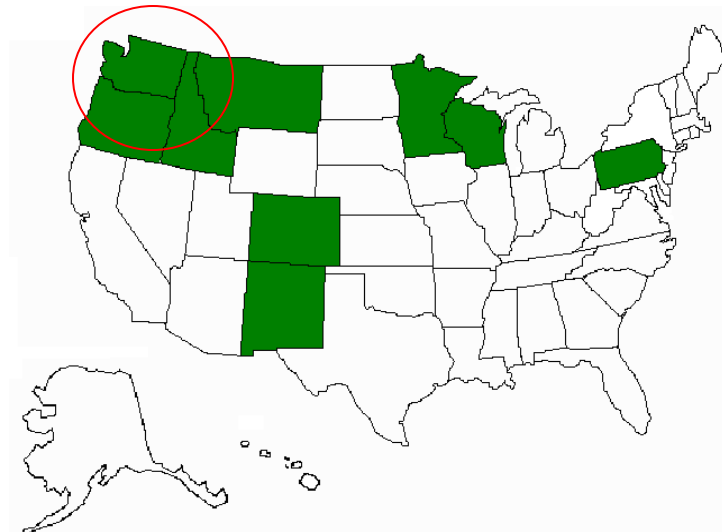
- The Agriculture and Food Research Initiative (AFRI) funds Coordinated Agricultural Projects (CAPs) that integrated research, extension, and education grants that address key problems of National, regional, and multi-state importance in sustaining all components of agriculture, including farm efficiency and profitability, ranching, **renewable energy**, forestry (both urban and agroforestry), aquaculture, rural communities and entrepreneurship, human nutrition, food safety, biotechnology, and conventional breeding.
- Challenge Area: Develop regional systems for the sustainable production of biofuels, biopower, and biobased products to enhance existing agricultural systems and provide alternatives to fossil-based fuel and products to extend the availability of these finite feedstocks and partially address environmental impacts.
- Five year consortia projects with transdisciplinary systems approach. Partnerships, economic, environmental, and social assessment.



# Northwest Advanced Renewables Alliance (NARA): New Vista for Green Fuels, Chemicals, and Products

**WA St U, \$40,000,000 (5 years)**

- **41 Key Personnel representing 9 Universities, 3 Federal Partners, and 4 Industrial Partners from 9 States:**
  - *Renewable aviation fuel, value-added industrial chemicals*
  - *Woody biomass residues*
    - *Weyerhaeuser, other landowners*
    - *Bioconversion and fuel production*
    - *Gevo, Catchlight*





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# USDA Partnerships

***Farm to Fleet Program***

***Defense Production Act***



# Farm to Fleet

## Agriculture, Navy Secretaries Promote U.S. Military Energy Independence with 'Farm-to-Fleet'

WASHINGTON, Dec. 11, 2013 – Agriculture Secretary Tom Vilsack and Secretary of the Navy Ray Mabus today announced the U.S. Departments of Agriculture (USDA) and Navy's joint "Farm-to-Fleet" venture will now make biofuel blends part of regular, operational fuel purchase and use by the military. The announcement incorporates the acquisition of biofuel blends into regular Department of Defense (DOD) domestic solicitations for jet engine and marine diesel fuels. **The Navy will seek to purchase JP-5 and F-76 advanced drop-in biofuels blended from 10 to 50 percent with conventional fuels. Funds from USDA's Commodity Credit Corporation (CCC) will assist the effort.**

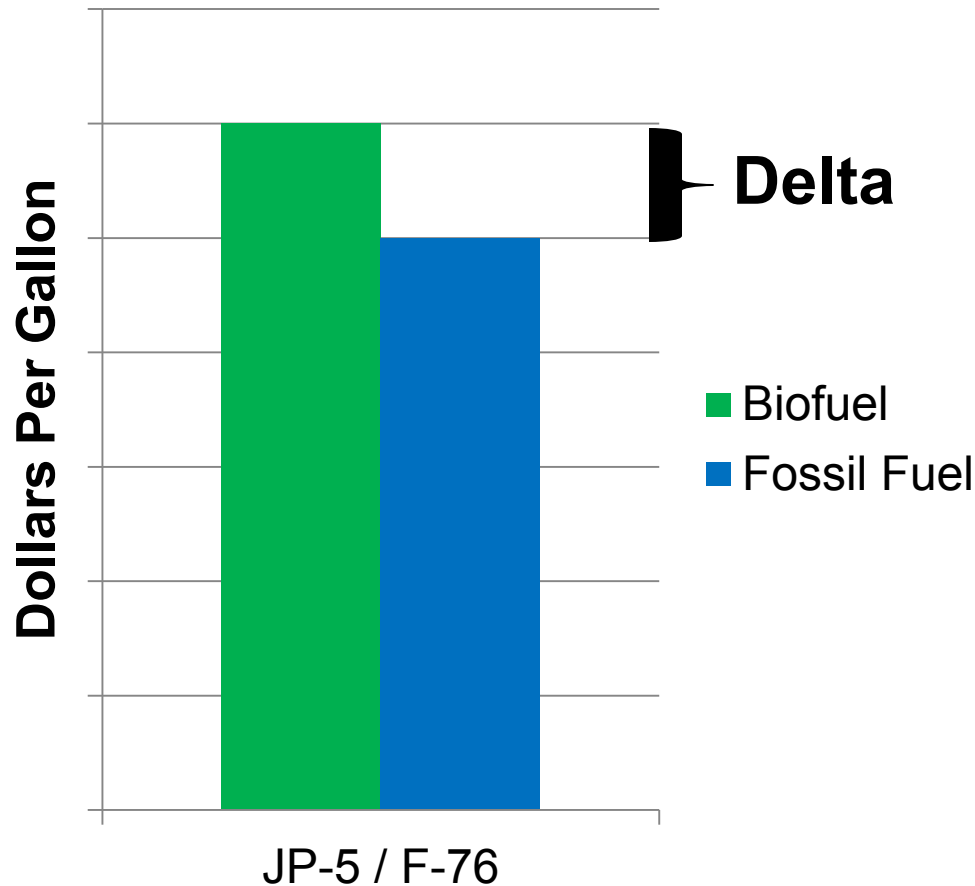
***Farm-to-Fleet builds on the USDA / U.S. Navy partnership inaugurated in 2010, when President Barack Obama challenged his Secretaries of Agriculture, Energy and Navy to investigate how they could work together to speed the development of domestic, competitively-priced "drop-in" diesel and jet fuel substitutes.***





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## Illustration of the Use of CCC funds





# FEEDSTOCKS

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- **Feedstocks can be divided into 4 categories**
  - 1. Generate a RIN, not eligible for CCC funding support**
  - 2. Do not generate a RIN, eligible for CCC funding support**
  - 3. Generate a RIN, eligible for CCC funding support**
  - 4. Do not generate a RIN, not eligible for CCC funding support**



# Acceptable Feedstocks

- Annual cover crops and oil produced from these cover crops (these will likely need to be approved by Environmental Protection Agency on case by case basis)
- Slash, pre-commercial thinnings, tree residue and forest residue
- Wood mill residue and waste
- Camelina and camelina oil



# Acceptable Feedstocks

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- Non-food grade corn oil
- Rapeseed oil (Industrial grade)
- Cellulosic biomass from crop residues, i.e., stover, wheat straw, rice straw
- Switchgrass
- Miscanthus



# Acceptable Feedstocks

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- Energy cane
  - Fats, oils and greases derived in the initial processing phase but not otherwise used by a consumer
  - Other agricultural products approved by the Commodity Credit Corporation
  - Note: the provided list is not all-inclusive, additional feedstocks can be approved



# Unacceptable Feedstocks

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- Food waste
- Yard waste
- Municipal solid waste



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**THANK YOU**

# *USDA update on Advancing Biomass Projects*

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*Todd Campbell*  
*USDA Rural Development*

**Farm to Fleet Industry Day**  
*January 30<sup>th</sup>, 2014*



# USDA Biomass Updates

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- Biorefinery Assistance Program
- Biomass Crop Assistance Program
- Regional Biomass Research Centers
- BioPreferred Program
- Farm Bill “Title IX” Update

# Biorefinery Assistance Program

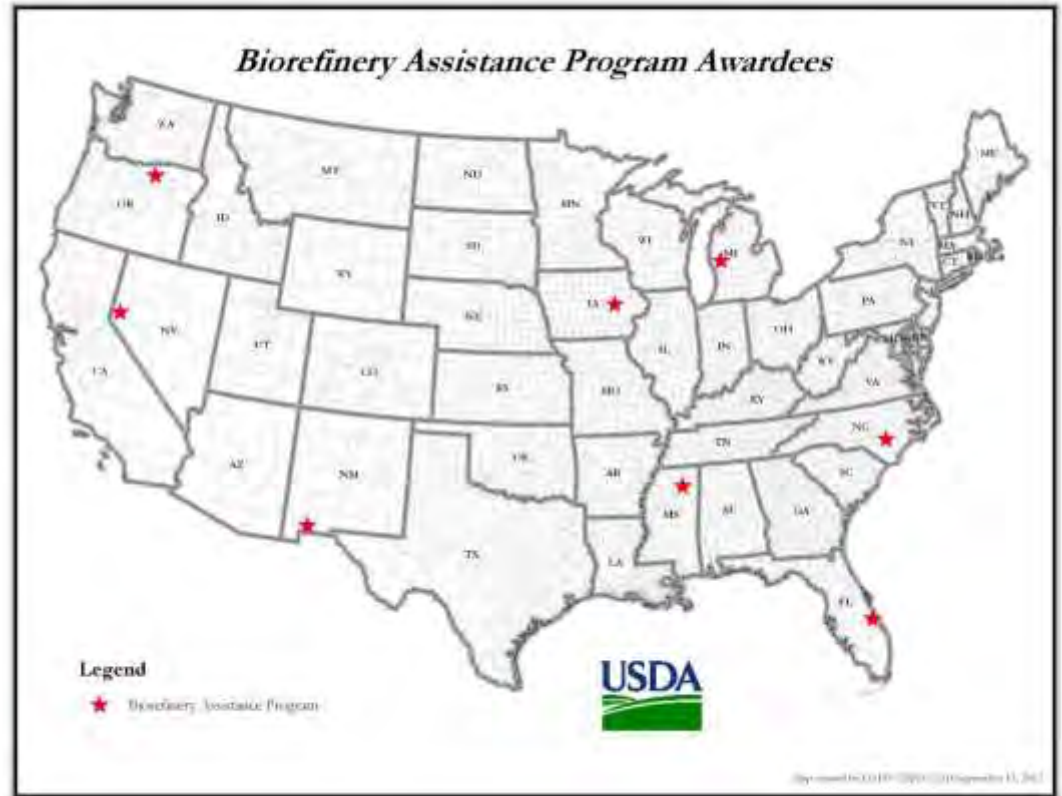
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- Sapphire Energy, algae-to-crude oil project in New Mexico, has paid off \$54.5M loan guarantee, continuous operation since May 2012
- Freemont (MI) Community Digester, fully operational
- INEOS Bio in Vero Beach, Florida producing cellulosic ethanol at commercial scale, first ethanol shipments were released in August



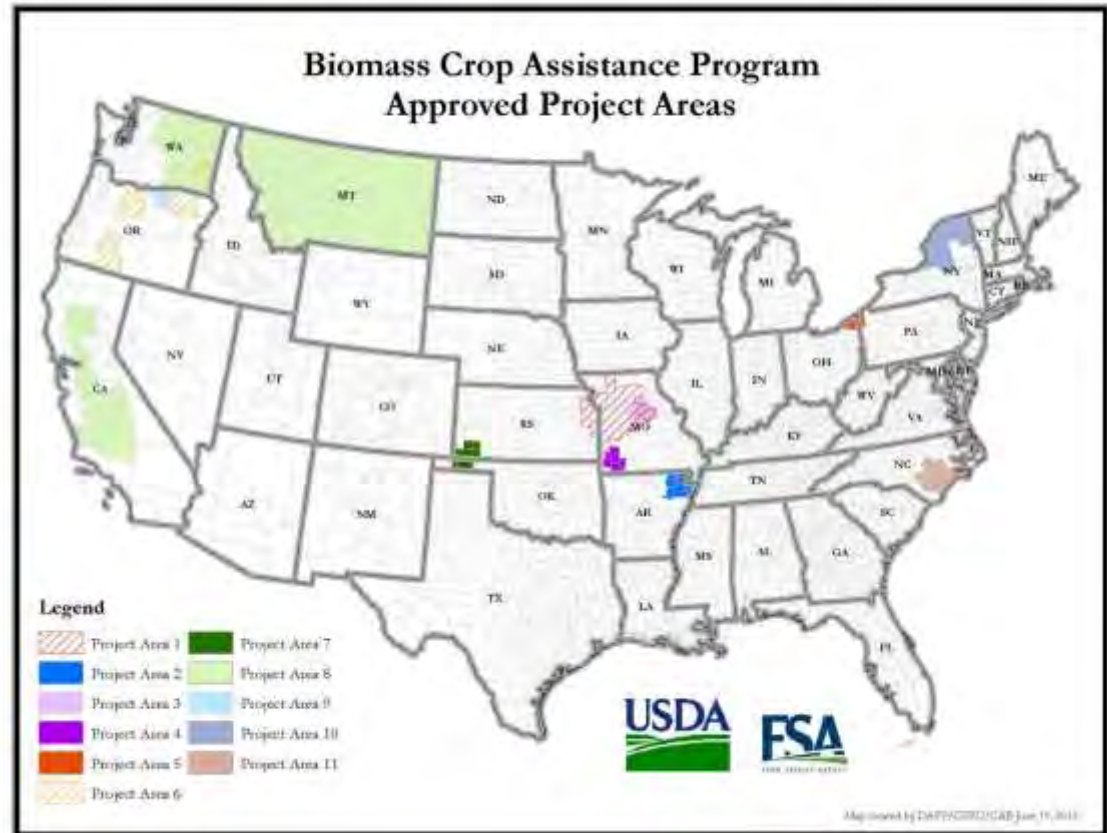
# 2009-2012 Biorefinery Assistance Program

- Currently 8 Active Projects
- \$717 M Guaranteed Loans Announced removing Sapphire
- 79.3 MMG/year, 9 MW capacity
- MI, FL, AL, MS, IA, OR, NV, NC
- Woody Biomass, Ag Residue, Grasses, MSW



# Biomass Crop Assistance Program Establishment

- 188 counties across 12 States
- 59,000+ acres enrolled
- 880 farmers-landowner contracts
- Grasses, Miscanthus, Camilina, Hybrid Poplar, Willow



# ARS/FS Regional Biomass Research Centers

**Central-East Regional Center:** Development of perennial grasses and biomass sorghum, corn grain ethanol and corn stover cellulosic biomass. Emphasis is on integrating in production systems to enhance water, air quality and to minimize the adverse affects of bioenergy on existing agricultural markets, increase system efficiency through introduction of nitrogen-fixing plants, Integration of perennial grass feedstocks to reduce nutrient escape, greenhouse gas emissions

**Northern-East Regional Center:**  
Coordinated by Forest Service R&D; focuses on production of woody biomass for biofuels, screening for superior traits; short-rotation woody crops; sustainable management systems, including forest health and conventional forest operations; LCA; supply and demand; conversion to fuels and coproducts; and deployment.

**Southeastern Regional Center:** The highest priority research need for the Southeastern region is the development of superior performing herbaceous feedstocks: energy cane; biomass sorghum, including sweet sorghum; other subtropical/ tropical perennial grasses; Incorporating dedicated biomass crops into existing row crop, pasture, agroforestry, and forest-based systems

**Northwestern Regional Center:**  
Oilseed crop efforts coordinated with Western, emphasis on integrating production, minimizing impact on wheat; restoration of rangelands w/ removal of invasives. Emphasis is on wood utilization; poplar genomics, genetics, and short rotation; resource supply and characterization; standards for sustainable management

**Western Regional Center:**  
Development of new industrial oilseed crops, includes genomic modifications to optimize fatty acid genes and cultivars, germplasm characterizations. New cropping systems, water availability. Use of invasives to restore rangelands; use of insect-, fire-, or disease-killed wood, areas at high risk of loss or damage; residue removal; pyrolysis and biochar; handling and transportation.

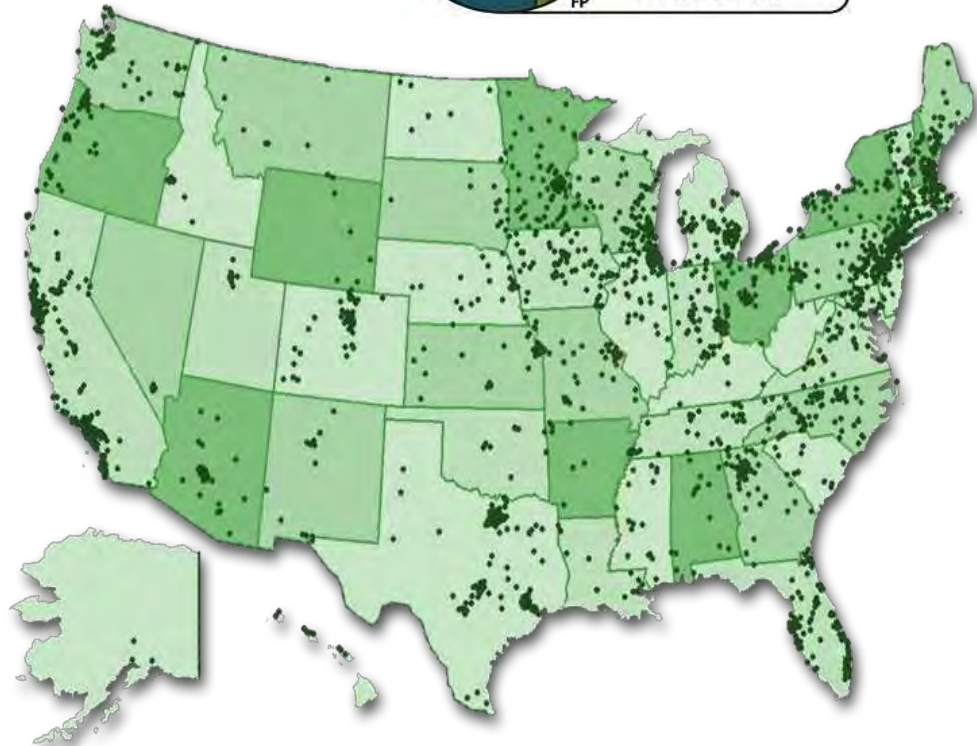




# BioPreferred- Biobased Product Marketing

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- Launched February 2011
- Unbiased biobased content certification partnership with ASTM International
- 900 individual products have received the USDA Certified Biobased Product label (shown right)
- Biopreferred Program has reopened the web portal for companies to apply for the voluntary USDA Certified Biobased Product label
- Now 97 designated categories representing approx. 10,000 unique product types for Federal Procurement
- <http://www.biopreferred.gov>



# Renewable Chemicals under Business and Industry Guarantee Loan Program

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- Myriant Corporation- Lake Providence, LA
- \$25 million loan guarantee
- Bio-based production of 15,000 tons/year of succinic acid, 18,000 tons/year of ammonium sulfate



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*Thank you!*

*For more information on USDA Energy Programs, visit: [www.usda.gov/energy](http://www.usda.gov/energy)*