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Evolving Priorities for NIFA Funded Bioenergy Work

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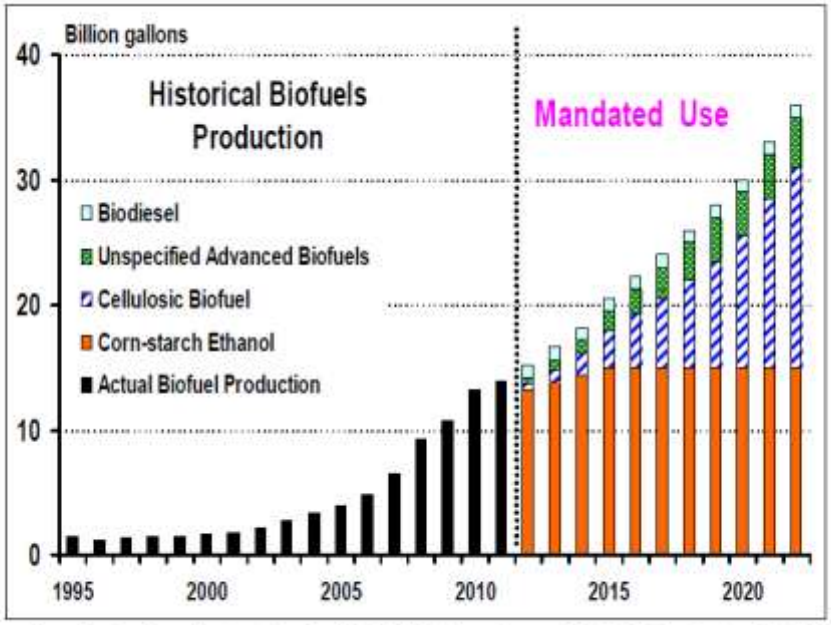
Energy Independence and Security Act (EISA) of 2007 Calls for the nation to produce 36 billion gallons per year of biofuels by 2022.

Figure 1. Renewable Fuels Standard (RFS2) vs. U.S. Ethanol Production Since 1995



Source: Actual ethanol production data for 1995-2010 is from Renewable Fuels Association; the RFS2 by category is from EISA (P.L. 110-140).

Some Observations from USDA and Department of Energy Scientists

Biomass Feedstocks Supply and Production

- Supply is inadequate to meet future demands.
- Supply is widely distributed at relatively low spatial densities and of low quality that contribute to higher costs and an aversion to biorefinery investments.
- Feedstocks can be seasonal and require storage or alternative production schedules or biorefinery sourcing systems.
- Production costs are high and profit margins low resulting in producer reluctance.
- New crops are difficult to establish and integrate into conventional production systems.
- Plant material has neither been fully developed for high yields nor resistant to pests, drought, cold, etc.

Some Observations from USDA and Department of Energy Scientists (continued)

Biomass Feedstocks Supply and Production

- GMO crops are not readily accepted by the public and are difficult to deploy due to requirements for deregulation.
- Production costs are high and efficient technologies may not be available to producers.
- Institutional knowledge, data, and management systems not defined and training, education, and extension efforts are not fully developed.
- Sustainability has not been definitively addressed for new crops, production systems, and technologies given a range of various geographical distributions and climatic conditions.
- Best management practices are not defined, documented, and deployed.
- Biological, ecological, and economic data and models do not exist analyzing production systems.

Some Observations from USDA and Department of Energy Scientists (continued)

Biomass Feedstocks Supply and Production

- Techno-economic data and analyses are not readily available for business development and management.
- Large-scale production, conversion of land to energy production has some social resistance along with concerns over commodity shortages, ecology degradation, and environmental issues.
- Case studies that incorporate different business models, life cycle analysis, regulations and policies such as crop insurance and certification have not been constructed.
- Life cycle inventories and analysis are lacking for most feedstocks.
- Techno-economic data and analyses are not readily available for business development and management.

In particular, for cellulosic supply systems to be successful (Womac. 2012) we must:

1) Reduce overall costs of the supply system in order to justify the substantial investment in biorefineries and feedstock delivery systems.

2) Advance in depth knowledge of the wide array of biomass production crops in order to make well informed decisions about selecting and investing in crop stands.

3) Develop new equipment and storage technologies.

4) And, in general, advance knowledge to optimize the feedstock logistics system.

Future Directions for NIFA Supported Work:

- Refinement and implementation of sustainable regional feedstock production practices which may include crop residues and wastes.
- Development of seamless and optimized feedstock logistics.
- Scalable, sustainable conversion technologies that can accept a diverse range of feedstocks.
- Advanced conversion technologies.
- Development of regional marketing and distribution systems.
- Development of regional sustainability analyses, data collection and management, and tools to support decision-making.
- Development of a well trained workforce with the capacity to fill the cross-disciplinary needs of the biofuels industry.
- Examination of policies with the identification of policies and economic systems that reduce dependence on foreign sources of energy, provide for climate change mitigation, support rural communities and result in sustainable natural resource use.
- Development and deployment of superior genotypes of regionally-appropriate dedicated energy crops.

NIFA Grant Programs

- The Agriculture and Food Research Initiative (AFRI).
- The Feedstock Genomics Program operated in partnership by NIFA/DoE.
- The Biomass Research and Development Initiative (BRDI).
- The Small Business Innovation Research Program.
- The Critical Agricultural Materials Program.
- The Biodiesel Fuel Education Program.

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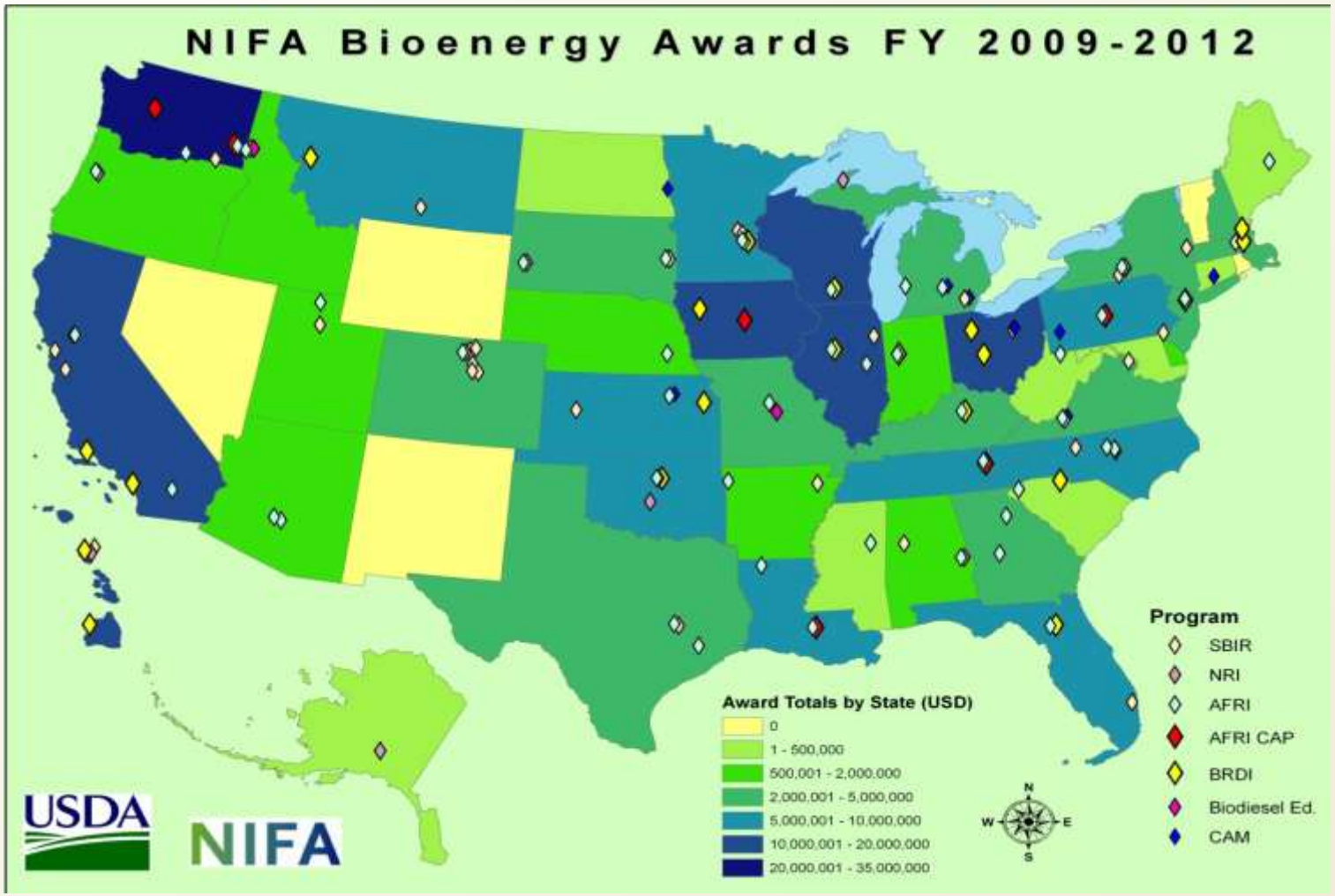
NIFA Bioenergy Awards FY 2009-2012
Award Totals by State (USD)
0
1 - 500,000
500,001 - 2,000,000
2,000,001 - 5,000,000
5,000,001 - 10,000,000
10,000,001 - 20,000,000
20,000,001 - 35,000,000
Program
SBIR
NRI
AFRI
AFRI CAP
BRDI
Biodiesel Ed.
CAM
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W
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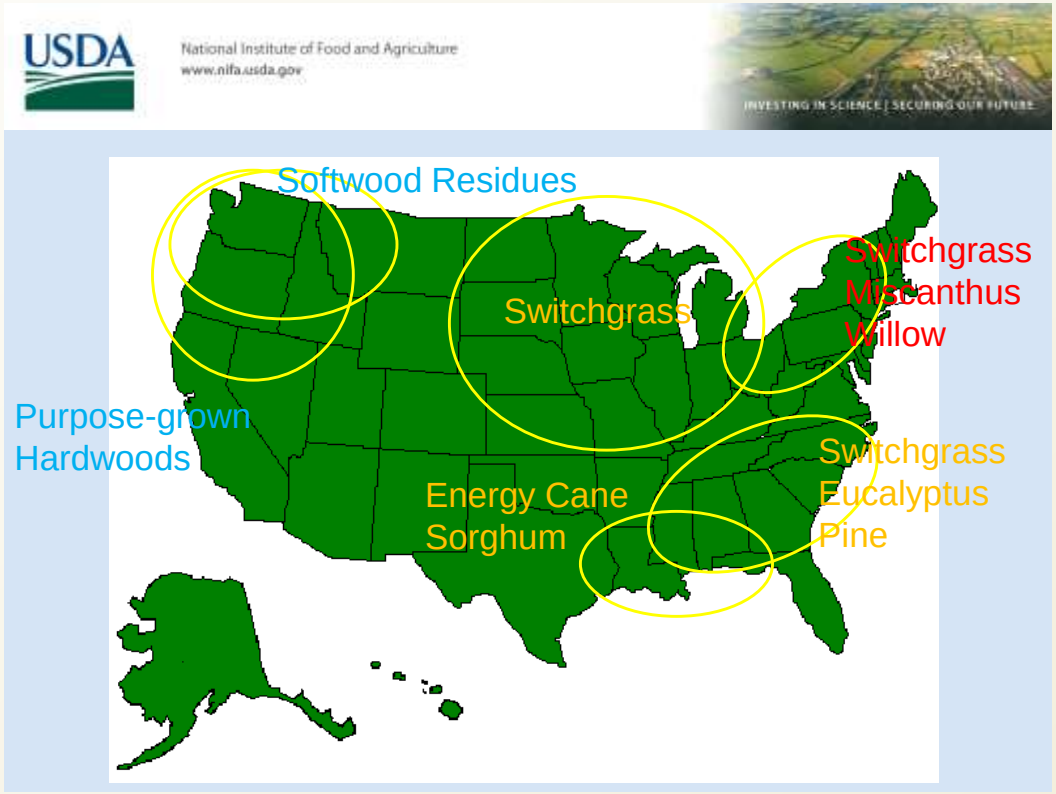

Figure 2. Existing Regional Sustainable Bioenergy Coordinated Agricultural Projects.

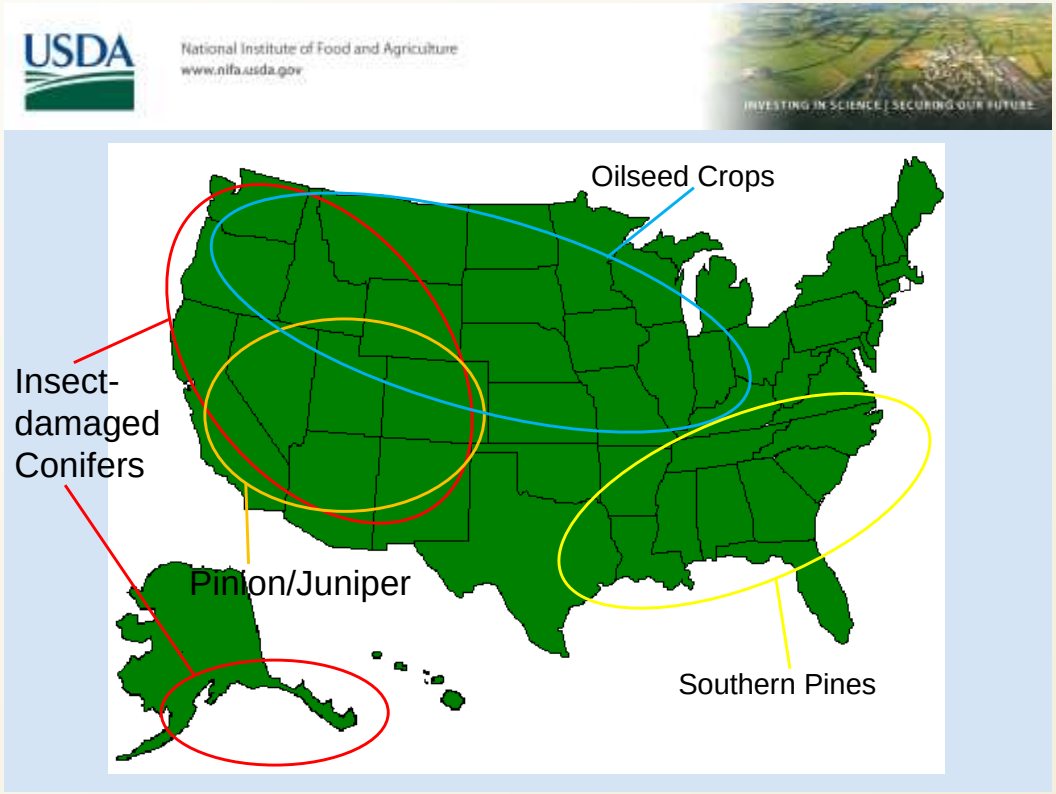

Figure 3. Current Gaps in Regional Sustainable Bioenergy Coordinated Agricultural Projects


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