U.S. Department of Agriculture

RESEARCH AND DEVELOPMENT ACTIVITIES BY ROADMAP CATEGORY

Prepared for:

Biomass Technical Advisory Committee and the Interagency Biomass Research and Development Board

February 24, 2003

UNITED STATES DEPARTMENT OF AGRICULTURE

Biobased Products and Bioenergy Programs

(Dollars in Thousands)

USDA Agency	National Program	Page Reference	Performer	2002 Actual		2003 Budget		2004 Budget
Agricultural Research Service	Quality and Utilization of Ag Products National Program (306) and	Pg. 2			-		-	
	Bioenergy and Energy Alternatives National Program (307)		In-house	64,217		67,392		67,392
Cooperative State Research	National Research Initiative		competitive awards	3,000		10,000		12,620
Education and Extension Service	Formula programs	Pg. 12	land grant institutions	4,090		3,907		3,931
	Spec. Res. Grants/earmarks		academia	5,114		0		0
Farm Service Agency	Bioenergy Program	Pg. 17	In-house (program management); Extramural (Program funds are payments)	78,744		150,000		100,000
Forest Service	Resource Valuation and Use Research, and		In-house	5,450		9,000		6,450
	Vegetative Management and Protection Research	Pg. 20	{National Forest products Laboratory in Madison, WI and at numerous smaller field locations throughout the U.S.)					

Natural Resources Conservation Service	Biomass Research and Development Act of 2000	Pg. 25	Grants and Contracts	2,700	a/	16,300	b/	14,000
	a/ Of the $5 million available in 2002, $2.7 million was used in 2002 and the remaining $2.3 million is carried forward for use in 2003.							
	b/ Includes $14 million in new funding and $2.3 million in 2002 carryover.							
Office of the Chief Economist	Policy and Economic Analysis	Pg. 29	Intramural	612		634		634
	Federal Procurement of Biobased Products		Intramural and Cooperative Agreements	1,000		1,000		1,000
	Biodiesel Fuel Education Program		Extramural: Competitive Grants	0		1,000		1,000
			Totals	**164,927**		**259,233**		**207,027**

ARS

Relevant Biomass R&D Roadmap Category: II.A. Biotechnology and Plant Physiology

USDA Agency: Agricultural Research Service

Relevant USDA Agency Program: Bioenergy and Energy Alternatives National Program (307)

St. Paul, Minnesota

- ❑ Improve legumes for biofuel by genetically altering the chemical composition of alfalfa and by developing alfalfa germplasm and management systems for improved biomass production.

Albany, California, Western Regional Research Center

- ❑ Improve cereal crops for production of biofuel through an integrated plant molecular biology, genomics, bioinformatics, and plant transformation approach.

Corvallis, Oregon

- ❑ Develop germplasm and cultivars of grasses that produce high yields of biomass for energy production.

Lincoln, Nebraska

- ❑ Develop germplasm and cultivars for perennial grasses with improved biomass yield and quality for biofuel production.

Tifton, Georgia

- ❑ Develop germplasm and cultivars of subtropical grasses that produce high yields of quality biomass for fuel production.

FY 2002 Actual:	**FY 2003 Proposed**:	**FY 2004 Budget:**
$1.446M	$3.646M	$3.646M

Relevant Biomass R&D Roadmap Category: II.B. Agronomic Practices

USDA Agency: Agricultural Research Service

Relevant USDA Agency Program: Bioenergy and Energy Alternatives National Program (307)

Lincoln, Nebraska

- ❏ Develop management practices for production of perennial herbaceous energy crops, with improved quality for conversion to biofuel, on degraded cropland, pastures, and rangeland.

Corvallis, Oregon

- ❏ Develop management systems for production of grasses that produce high yields and improve soil quality when grown as energy crops on Conservation Reserve Program (CRP) land and buffer strips.

Mandan, North Dakota

- ❏ Develop sustainable systems for managing perennial grass production on conservation lands, with consideration of biomass production, carbon sequestration, and soil quality.

El Reno, Oklahoma

- ❏ Identify biomass crops that are productive and adapted to the southern Great Plains and develop systems for sustainable production of these crops on Conservation Reserve Program (CRP) land and buffer strips.

Tifton, Georgia

- ❏ Develop management systems for production of warm season grasses as energy crops on Conservation Reserve Program (CRP) land and buffer strips.

University Park, Pennsylvania

❑ Develop sustainable systems for herbaceous energy crop production on conservation lands that maintain and enhance soil and water quality and integrate these production practices into whole-farm systems with consideration of economic and environmental impact.

FY 2002 Actual:	**FY 2003 Proposed**:	**FY 2004 Budget:**
$1.338M	$2.138M	$2.138M

Relevant Biomass R&D Roadmap Category: II.C. Feedstock Handling

USDA Agency: Agricultural Research Service

Relevant USDA Agency Program: Bioenergy and Energy Alternatives National Program (307)

Madison, Wisconsin

- ❑ Develop herbaceous biomass harvesting and handling systems.

Brookings, South Dakota

- ❑ Develop harvesting and handling systems that add value on the farm to herbaceous crops produced for biofuel production.

FY 2002 Actual:	**FY 2003 Proposed**:	**FY 2004 Budget:**
$0.582M	$0.582M	$0.582M

Relevant Biomass R&D Roadmap Category: IV.A. End-Products and Distribution Systems

USDA Agency: Agricultural Research Service

Relevant USDA Agency Program: Bioenergy and Energy Alternatives National Program (307)

Madison, Wisconsin

- ❑ Establish methods for characterizing and measuring quality of biomass for conversion to biofuel.

Peoria, Illinois, National Center for Agricultural Utilization Research

- ❑ Develop formulations that improve performance of biodiesel produced from soybean oil and expand application of biodiesel for off-road applications.

FY 2002 Actual:	**FY 2003 Proposed**:	**FY 2004 Budget:**
$1.369M	$1.369M	$1.369M

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Relevant Websites:
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Relevant Biomass R&D Roadmap Category: BioConversion

USDA Program/Budget Area: Research, Education, & Economics

USDA Agency: Agricultural Research Service

Relevant USDA Agency Program(s): Quality and Utilization of Agricultural Products National Program (306), Bioenergy and Energy Alternatives National Program (307)

Program Summary: ARS research on biobased products is conducted primarily under ARS National Program 306, Quality and Utilization of Agricultural Products. ARS biofuels research is conducted primarily under ARS National Program 307, Bioenergy and Energy Alternatives. The bulk of conversion research is carried out at the four ARS Regional Research Centers in Albany, CA, New Orleans, LA, Peoria, IL, and Wyndmoor, PA. The broad nature of these programs is as follows:

Albany, CA, Western Regional Research Center

- ❑ Convert crops, processing coproducts, residues, and byproducts - including those from wheat, rice, castor, and guayule - into value-added biobased industrial products such as
  - $ films, fibers and composites
  - $ industrial oils
  - $ nutraceuticals.

- ❑ Create new enzymes through the use of directed molecular evolution for
  - $ conversion of grain-derived starch and lignocellulosics from wheat and other small grain cereals to fermentable sugars
  - $ production of biofuels, biopolymers, and other industrial chemicals.

New Orleans, LA, Southern Regional Research Center

- ❑ Enhance utilization of agricultural commodities and residues, specifically
  - $ convert agricultural residues, such as nutshells and soybean hulls, and biosolids into value-added adsorbents for removal of metals or organic compounds commonly found in potable water or wastewater,
  - $ develop enzymatic processes to increase the reactivity of fatty acid components of vegetable oils in order to enhance industrial utilization,
  - $ develop innovative separation and purification processes to enhance the utilization of cottonseed products with minimum undesirable environmental impact.

- ❑ Improve quality, processing and utilization of cotton and other plant fibers, specifically
  - $ develop improved dry and wet techniques for the processing of cotton from the

bale to the retailer,

- $ develop composite and nonwoven materials from cotton for construction, automobile interiors, and other industrial applications,
- $ develop biomedical textiles from cotton for chronic and non-chronic wounds and antibacterial treatments for textiles to prevent the transmission of disease.

Peoria, IL, National Center for Agricultural Utilization Research

- ❑ Extract, modify and develop new and improved value-added non-food products from soybeans, corn and other grains, using biological, chemical and physical processing techniques, specifically
  - $ develop new concepts in utilizing vegetable oils (emphasizing soybean oil) as alternative critical industrial materials, chemicals and fuels,
  - $ conduct basic research into the physical, chemical and biochemical nature of biopolymers such as carbohydrates, proteins, gums, lipids, and other biopolymers found in whole plant residues,
  - $ develop plant-based polymers for industrial applications from traditional and alternative crops,
  - $ develop new and environmentally-compatible processes for the conversion of agrimaterials to higher value industrial products via solid-fluid catalysts and chemical transformation in supercritical carbon dioxide and cosolvent mixtures and subcritical or supercritical water.

- ❑ Improve conversion of plant cellulose and lignocellulose, primarily from corn, into biofuels and chemicals, enzymes, and polymers, specifically
  - $ develop bioprocess and metabolic engineering technologies that expand biofuel feedstocks,
  - $ develop pretreatment, enzyme, and fermentation technologies for the conversion of corn fiber and other agricultural substrates into biofuels (e.g. ethanol, butanol) and value-added fermentation products (e.g. enzymes, polysaccharides, lactic acid).
  - $ determine the metabolic physiologic, and genetic fundamentals underlying microbial stress-tolerance and engineer improved strains and process conditions allowing manifestation of stress tolerance in microbes for production of biofuels and coproducts.
  - $ develop new bioprocess strategies for the fermentation of biomass substrates to biofuels and microbial products including the development of pretreatment methods that combine chemical/physical treatment with novel enzymes customized to achieve complete saccharification.
  - $ develop methods to reduce fermentation inhibition present in biomass hydrolysates.
  - $ develop improved methods for recovery of microbial fermentation products from dilute product streams.

- $ develop biocatalysts that will function under harsh processing environments for the bioconversion of agricultural materials to low cost fuels and other microbial products.
- $ add value to agricultural wastes.

Wyndmoor, PA, Eastern Regional Research Center

- ❑ Develop new and improved value-added non-food products from animal fibers and food animal processing coproducts and byproducts, specifically
  - $ convert agricultural fats, oils and greases into biodiesel, neutraceuticals and other structured lipids, oxygenated lipids, biodegradable polymers and surfactants, using enzymes, biomimetic agents and fermentation technologies,
  - $ improve quality and utility of animal fibers and byproducts (animal hides and skins, wool and other hair and rendering materials - meat and bone meal and feathers).

- ❑ Improve processing of corn and other grains for conversion to ethanol and other value-added products, specifically
  - $ develop new alternative methods for corn fractionation using enzymes and other sustainable processes that maximize yield of starch and value of all other co-products,
  - $ develop sustainable, cost efficient processes for conversion of corn and other grains into ethanol, co-products, and industrial biobased products,
  - $ develop technology to lower costs for feedstock, refining, and ethanol production that will improve competitiveness of ethanol as a fuel or fuel additive.

- ❑ Develop a comprehensive systems approach using sustainable technologies for the extraction and modification of pectin and related polysaccharides to create new biobased products.

Beltsville, MD, Environmental Quality Laboratory

Develop feather fiber/quill separation technologies and uses for keratin containing quill.

Madison, WI, U.S. Dairy Forage Research Center

Crop residues, fecal fiber, and fermentation residues will be evaluated for gasification & for production of structural composites with bacterial glycocalyx as bioadhesive. Fiber will also be evaluated as filter matrix for the adsorption of pollutants from water.

Athens, GA, Quality Assessment Research

Enhancing value of fiber commodities, such as industrial fibers kenaf, flax, and cotton, through microbial and enzymatic activities.

Winter Haven, FL, Quality Improvement in Citrus and Subtropical Products Research

Develop stabilized bioabsorbents and other industrial products from pectin

FY 2002 Funding:	**FY 2003 (President's) Budget**	**FY 2004**
$59.482M	$59.657M	$59.657M

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CSREES

Relevant Biomass R&D Roadmap Category: Bioconversion

USDA Program/Budget Area: Research, Education and Economics

USDA Agency: Cooperative State Research Education and Extension Service

Relevant USDA Agency Program(s): NRI, Special Research Grants/Earmarks, Formula Funds

Program Summary: Under NRI, the topic area Value-Added Products includes two sub-topics: Non-Food Characterization/Process/Product Research and Improved Utilization of Wood and Wood Fiber. The Non-Food sub-topic addresses research and development of physical, chemical and biological modifications of plant and animal materials to aid in the development of value-added, high value products, biochemical and chemical catalysis, new uses for under-utilized co-products and residuals from agricultural and food processing operations. Examples of research include development of chemicals and materials such as adhesives, adsorbents, coatings, detergents, plastics, copolymers, specialty fibers, textiles and composites. Process technologies include raw material preparation, chemical and bioconversions, methods for processing co-products such as leather, food processing waste and crop residues, product development and biodegradation studies. Research on biofuels addresses conversion of biomass emphasizing biological processes central to the conversion process, including physiological, biochemical and genetic factors. Biodiesel research is limited to crop improvement related to crop improvement and conversion technology.

The NRI Improved Utilization of Wood and Wood Fiber sub-topic addresses research to enhance value and develop new products with an emphasis on basic wood processing, innovative processes and products for more efficient conversion of wood-based materials into primary and value-added products.

Special Research Grants, Congressional earmarks and formula funds focus on chemical and enzymatic conversion of oils, starches, proteins, and lignocellulosic materials forestry operations, and from commodity crops as well as new industrial crops such as meadowfoam, canola, hesperaloe, castor, guayule and lesquerella.

FY 2002 Actual:	**FY 2003 Estimate:**	**FY 2004 Budget:**
11,133,000	13,099,000	15,743,000

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Relevant Biomass R&D Roadmap Category: Biotechnology and Plant Physiology

USDA Program/Budget Area: Research, Education and Economics

USDA Agency: Cooperative State Research Education and Extension Service

Relevant USDA Agency Program(s): NRI, Special Research Grants/Earmarks, Formula Funds

Program Summary: With the exception of three special research grants and participation in an interagency program (described below), agency programs are not targeted specifically to biobased products, fuels or power. The programs do include fundamental studies of plant and animal structures/properties to enhance product quality and processing characteristics. Wood chemistry and biochemistry address the principles governing the biological, physical and chemical reactions in wood, wood formation and wood-based materials.

NRI participates in the Metabolic Engineering Program with DOE, NSF, EPA, NIST and NASA to leverage funding for research on the basic science of plant and microbial metabolism, and to target alteration of metabolic pathways for chemical transformation, energy transduction and supramolecular assembly to produce the desired chemical, or enzyme.

FY 2002 Actual: **FY 2003 Estimate:** **FY 2004 Budget:**
[Funding for this category has been included in the Bioconversion category.]

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Relevant Biomass R&D Roadmap Category: Agronomic Practices

USDA Program/Budget Area: Research, Education and Economics

USDA Agency: Cooperative State Research Education and Extension Service

Relevant USDA Agency Program(s): NRI, Special Research Grants/Earmarks, Formula Funds

Program Summary: Agronomic practices include the production and harvesting of crops and trees to maximize biomass quantity and quality for subsequent processing and include integrated pest management practices and other sustainable agricultural practices. Funding is provided to expand canola production in five regions across the U.S. and for trees as energy crops (silviculture).

FY 2002 Actual:	FY 2003 Estimate:	FY 2004 Budget:
1,071,000	808,000	808,000

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FSA

Relevant Biomass R&D Roadmap Category: Crosscutting/Multi-category

USDA Program/Budget Area: Commodity Credit Corporation

USDA Agency: Farm Service Agency

Relevant USDA Agency Program(s): Bioenergy Program (7 CFR Part 1424)

Program Summary: The Commodity Credit Corporation's (CCC) Bioenergy Program (Program) was extended through Fiscal Year (FY) 2006 by the 2002 Farm Bill. The Program reimburses eligible producers of bioenergy (commercial fuel grade ethanol and biodiesel) for part of their input costs of eligible commodities used to increase bioenergy production over the previous FY. The Farm Bill made changes including modifying the definitions for biodiesel, conversion factor, eligible commodities and ethanol, extending the program beyond FY 2002, and allowing producers to enter into multi-year contracts for program payments. CCC published a Proposed Rule in the October 1, 2002 Federal Register with a 30 day comment period to bring the Program's regulations at 7 CFR 1424 into compliance with the Farm Bill provisions. CCC is still in the rule making process and sign-up for FY 2003 and beyond will begin when the final rule is published.

Bioenergy Incentive Payments:
The Program supports the Biomass Research and Development Technical Advisory Committee's (Committee) Biofuels R&D Recommendations for Lignocellulosic Materials Research since bioenergy produced from cellulosic crops, such as switchgrass and hybrid poplars, are eligible for Program payments. This reduces producers' costs in making bioenergy from cellulosic crops. The Program addresses the Committee's Biofuels Non-R&D Recommendation for consistent long-term policies by establishing long-term agreements for Fiscal Years 2003 through 2006 thus allowing bioenergy producers to plan expansion. This is particularly important to biodiesel producers.

Biofuels:
The Program also addresses the Committee's Biobased Products Recommendation for Non-R&D Recommendation for Market Pull Strategies by providing both a financial incentive for bioenergy producers to increase production and thus increase use of eligible feedstocks. The Program makes the fuels more price competitive, which promotes development of the production and transportation infrastructure.

Biobased Products:
The Program also addresses the Committee's Biobased Products Recommendation for Non-R&D Recommendation for Market Pull Strategies by providing both a financial incentive for bioenergy producers to increase production and thus increase use of eligible feedstocks. Program payments also reduce financial risks associated with infrastructure development.

Crosscutting:
The Program also addresses the Committee's Crosscutting Recommendation for Non-R&D Recommendation for Market Pull Strategies by providing, as stated above, a financial incentive for bioenergy producers to increase production and thus increase use of eligible feedstocks.

FY 2002 Actual:	**FY 2003 Estimate**:	**FY 2004 Budget:**
$78.7 million	$150 million	$100 million

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FS

Programs Complementing Roadmap for Biomass Technologies

USDA Program/Budget Area: Natural Resources and the Environment

USDA Agency: Forest Service

Relevant USDA Agency Program(s): Resource Valuation and Use Research, Vegetative Management and Protection Research

Program Summary: Forest Service Research and Development (FS R&D) has had an active research program for almost 90 years in the growth and management of timber, timber removal, and forest products development. Biobased products research is directed toward development of cost-effective feedstock systems for wood fiber that are competitive with non-renewable resources and new technologies to provide low-cost and environmentally acceptable processing and manufacturing of wood-based products. Activities include development in the areas of composites, pulp and paper technology, adhesives, wood engineering, wood processing, wood preservation, harvesting, wood energy systems, and feedstock growth. This work is performed at one National Laboratory in Madison, WI and numerous smaller field locations throughout the United States.

Roadmap Category: Biotechnology and Plant Conversion

- Improves our technical understanding of wood biochemistry and enzymes for conversion of woody biomass to desired energy and pulp products - Forest Products Laboratory in Madison, WI (FPL).

- Develops biological pathways and genomic data on short rotation woody crops - Rhinelander, WI.

- Budget: FY 2002, $0.6 million FY 2003, $1.2 million FY 2004, $0.8 million

Roadmap Category: Agronomic Practices

- Optimizes silvicultural practices for sustainable short rotation woody crop feedstock production - Rhinelander, WI

- Looks at ecological management practices including soil sustainability, land use, water use, impact on wildlife for short rotation woody crop feedstock at several locations across the United States.

- Looks at the ecological impacts of the removal of small diameter timber to reduce fire

danger in our nation's forests at many locations throughout the United States.

- Budget: FY 2002, $2.0 million FY 2003, $2.9 million FY 2004, $2.4 million

Roadmap Category: Feedstock Handling

- Explores the best practices of cost-effective and environmentally sound harvesting, storage, and transport of forest biomass feedstocks - Auburn, AL; Portland, OR.

- Looks at feedstock handling of woody crop systems at multiple operational scales - Auburn, AL.

- Budget: FY 2002, $0.75 million FY 2003, $1.1 million FY 2004, $0.85 million

Roadmap Category: Thermochemical Conversion

- Explores the environmental benefits of conversion technologies for woody biomass to energy - FPL.

- Looks at economic benefits and improved operating systems, including forest biomass gasification, to produce energy - FPL.

- Budget: FY 2002, $0.2 million FY 2003, $0.5million FY 2004, $0.2 million

Roadmap Category: Bioconversion

- Develops improved enzymatic conversion technologies to produce liquid fuels from woody biomass – FPL.

- Develops more effective bioconversion of wood residues into fuels and chemicals – FPL.

- Budget: FY 2002, $0.5 million FY 2003, $ 0.8 million FY 2004, $0.6 million

Roadmap Category: End-Products and Distribution Systems

- Examines development of high valued products from woody biomass feedstocks –FPL, Princeton, WV; Blacksburg, VA.

- Supports development of standards on the performance of wood and wood fiber products - FPL.

- Budget: FY 2002, $0.8 million FY 2003, $1.5 million FY 2004, $1.0 million

Roadmap Category: Crosscutting Multi-category and Other

- Enhances the economic opportunities for rural communities – FPL; Portland, OR; Princeton, WV.

- Promotes commercialization of successfully demonstrated environmentally sound biobased technologies for short-rotation woody crop with focus on market pull strategies – FPL; New Orleans, LA.

- Budget: FY 2002, $0.5 million FY 2003, $1.0 million FY 2004, $0.5 million

Budget:[1]

FY 2002 Actual	FY 2003 Estimate (Dollars in Thousands)	FY 2004 Budget
5,450	9,000	6,450

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Relevant Website: http://www.fs.fed.us/research/

[1] Budget numbers are less than the overall funds in the USDA Biobased Products and Bioenergy Program Crosscut. The FS has major work in R&D on the removal and processing of small diameter timber to reduce fire danger on our Nation's forests, pulp and paper research to reduce effluents to our water streams and atmosphere, wood utilization, composite products to extend our country's timber supply, and the growth, management and harvesting of forest biomass for products not elaborated in the recommendations. This amounts to approximately $6.95 million in 2002, $8.45 million in 2003, and $7.95 million in 2004.

NRCS

Relevant Biomass R&D Roadmap Categories: Biotechnology and Plant Physiology, Agronomic Practices, Feedstock Handling, BioConversion, Public Policy Measures to Support Biomass R&D Development, and Crosscutting, /Multi-category and other

USDA Program/Budget Area: Bioenergy Transfer/ Natural Resources and Environment

USDA Agency: Natural Resources Conservation Service

Relevant USDA Agency Program(s): Conservation Operations, Resource Conservation and Development and Mandatory Transfer from Commodity Credit Corporation for Biomass Research and Development Act of 2000 (P.L. 106-224)

Program Summary: The Biomass Research and Development Act of 2000, as amended by the Farm Security and Rural Investment Act of 2002 (Section 9008), provides mandatory funding from the Commodity Credit Corporation to support the Biomass Research and Development Initiative. The Program is authorized at $5 million in fiscal year (FY) 2003 and at $14 million per year from FY 2003 through FY 2007. These funds will be used to implement the Biomass Research and Development Initiative. The Secretary of Agriculture and Secretary of Energy established a priority to award grants, contracts, and assistance that demonstrates potential for significant advances in biomass processing, demonstrates potential to substantially further scale-sensitive national objectives such as sustainable resource supplies, reduced greenhouse gas emissions, healthier rural economies, improved strategic security and trade balances, and improves knowledge of important biomass processing systems that demonstrate potential for commercial applications. The Research and Development Board is functioning. A technical advisory committee was appointed and is functioning along with an interagency working group. Two contracts were awarded in FY 2002 using a Department of Energy (DOE) Solicitation Process:

- **Johnston, Iowa. Iowa Corn Promotion Board: Value Added Products from Hemicellulose Utilization in Dry Mill Ethanol Plants (#A-19 for $2 million)**
    - The Iowa Corn Promotion Board, the Minnesota Corn Research and Promotion Council, and the Ohio Corn Marketing Program are teaming up with the Pacific Northwest National Laboratory and the Idaho National Engineering and Environmental Laboratory to develop technology to integrate enzymatic hydrolysis, fermentation and aqueous phase catalysis to produce high value components from hemicellulose. The resulting small market, high-value projects are of the appropriate scale for corn dry mill operations and will substantially improve their overall economics. Successful completion of this project will lead to value added products from dry mill corn ethanol facilities and will improve the overall economics of ethanol production.

- **Johnston, Iowa. Iowa Corn Promotion Board: Continuous Isosorbide Production from Sorbitol Using Solid Acid Catalysis (#A-20 for $0.7million)**
    - To continue their work, the Iowa Corn Promotion Board, in collaboration with Pacific Northwest National Laboratory and Archer Daniels Midland, currently funded by DOE, is developing an economically viable process that converts sorbitol, from corn wet milling operations, to isosorbide. The team has two objectives: one is to develop and commercialize an economically sustainable process and the other is to develop new markets for isosorbide. Uncommitted funds will be carried over for use in FY 2003.

The Department of Agriculture (USDA) will lead the joint solicitation process in FY 2003 to award $14 million in funding for biomass research, development, and demonstration activity. Natural Resources Conservation Service will receive proposals. A technical merit review committee comprised of professionals in the field of biomass/bioenergy will use a documented list of criteria to rate and rank the proposals for funding. USDA/DOE will prioritize the proposals and make recommendations for funding approval to the Biomass Research and Development Board. USDA/DOE will announce grant awards and funds will be obligated by September 1, 2003.

FY 2002 Actual	FY 2003 Estimate	FY 2004 President's Budget
$2,700,000	$16,300,000	$14,000,000

Note: Of the $5 million available in 2002, $2.7 million was used in 2002 and $2.3 million will be used in 2003.

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OCE

Relevant Biomass R&D Roadmap Category: Public Policy Measures to Support Biomass R&D Development

USDA Program/Budget Area: Office of the Chief Economist

USDA Agency: Office of Energy Policy and New Uses (OEPNU)

Relevant USDA Agency Program(s): Policy and Economic Analysis

Program Summary: OEPNU provides policy advice to the Secretary and economic analysis on biomass issues. Examples include development of a Departmental position on the energy bill, ethanol bill, ethanol cost of production analysis, the Department's net energy balance study, analysis of the Renewable Fuels Standard, evaluation of tax incentives on biodiesel, and development of a Memorandum of Understanding (MOU) with the Department of Energy (DOE) on hydrogen and fuel cell technology required by the Farm Bill.

FY 2002 Actual:	**FY 2003 Estimate:**	**FY 2004 Budget:**
$612 thousand	$634 thousand	$634 thousand

Agency Contact(s):

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Relevant Websites:

http://www.usda.gov/oce

Relevant Biomass R&D Roadmap Category: Public Policy Measures to Support Biomass R&D Development

USDA Program/Budget Area: Office of the Chief Economist

USDA Agency: Office of Energy Policy and New Uses (OEPNU)

Relevant USDA Agency Program(s): Federal procurement of biobased products

Program Summary: Funds are provided under Section 9002 of the 2002 Farm Bill from the Commodity Credit Corporation to support testing of biobased products. USDA expects to have the program providing for preferred procurement of biobased products by Federal agencies in early stages of operation by the end of fiscal year (FY) 2003. An electronic information system to post biobased products for preferred procurement for use by Federal Agencies is expected to be operational. Testing of biobased products for biobased content, life cycle costs, environmental effect, and product performance will be under way. USDA will develop a model procurement program for its own use and will participate in outreach and education activities to extend that program to other Federal agencies.

FY 2002 Actual:	FY 2003 Estimate:	FY 2004 Budget:
$1 million	$1 million	$1 million

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Relevant Biomass R&D Roadmap Category: Public Policy Measures to Support Biomass R&D Development

USDA Program/Budget Area: Office of the Chief Economist

USDA Agency: Office of Energy Policy and New Uses (OEPNU)

Relevant USDA Agency Program(s): Biodiesel fuel education program

Program Summary: Funds for this program are provided under Section 9004 of the 2002 Farm Bill from the Commodity Credit Corporation beginning in 2003. USDA has developed a grant program to support biodiesel fuel education programs. A request for proposals will be issued. By the end of FY 2003, grants totaling $1 million will have been made to several entities to deliver education programs across the Nation to targeted markets, such as urban bus fleets, government and private sector fleet operators, and facility managers. Education efforts under this grant program will continue into subsequent years through FY 2007.

FY 2002 Actual:	FY 2003 Estimate:	FY 2004 Budget:
$0 million	$1 million	$1 million

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