



U.S. Department of Agriculture



Office of Inspector General
Midwest Region

Audit Report

Implementation of Renewable Energy Programs at the Agricultural Research Service

Report No. 02601-0002-Ch
May 2008



UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF INSPECTOR GENERAL

Washington D.C. 20250



DATE: May 13, 2008

REPLY TO

ATTN OF: 02601-0002-Ch

TO: Edward B. Knipling
Administrator
Agricultural Research Service

FROM: Robert W. Young /s/
Assistant Inspector General
for Audit

SUBJECT: Implementation of Renewable Energy Programs at the Agricultural Research Service

This report presents the results of our audit of the agency's renewable energy research efforts. Our audit evaluated whether the agency was targeting its research to areas that would have the most impact on the nation's renewable energy needs and the process used to report renewable energy activities to the Department.

The agency response to the official draft report is included as exhibit B, with excerpts and the Office of Inspector General's position incorporated into the Findings and Recommendations section of the report. Based on the agency's response, we have not reached management decisions on the two recommendations presented in the report. The Findings and Recommendations section of this report includes a description of the information needed to reach management decisions for these recommendations.

In accordance with Departmental Regulation 1720-1, please provide a reply within 60 days, which includes the timeframes for completing the corrective actions. Please note that the regulation requires management decisions to be reached on all recommendations within a maximum of 6 months from report issuance, and final action be taken within 1 year of each management decision.

We appreciate the courtesies and cooperation extended to us by your staff.

Executive Summary

Implementation of Renewable Energy Programs at the Agricultural Research Service

Results in Brief

This report presents the results of our audit of the Agricultural Research Service's (ARS) efforts to support the development of domestic renewable energy. Within the United States Department of Agriculture (USDA), ARS is the primary agency responsible for conducting research projects. In recent years, the rising cost and questionable availability of foreign oil has resulted in numerous projects researching domestically available and sustainable sources of renewable energy. In 1999, ARS initiated the Bioenergy and Energy Alternatives National Program. It aimed to reduce dependence on foreign oil by developing alternative energy sources such as biofuels. Ethanol is the most common biofuel worldwide and domestically most ethanol is produced from corn. More recently, attention has focused on the production of ethanol from cellulosic biomass, which uses various organic source materials such as grasses and woodchips that do not have other competing uses as corn does. In February 2006, the President issued the Advanced Energy Initiative (AEI), which gave researchers the task to "foster the breakthrough technologies necessary to make cellulosic ethanol cost-competitive with corn ethanol by 2012."

Although in general we did not note problems with ARS' administration of renewable energy research, we did note that in some cases the agency's efforts were directed toward areas of questionable benefit. Since the inception of the Bioenergy and Energy Alternatives National Program, ARS has followed a 5-year cycle for its research projects. Although the agency reviews its ongoing research projects on an annual basis, this review does not evaluate the continued importance or relevance of ongoing research in terms of outside factors such as changing economic conditions. As a result, some research projects may be targeted toward areas that were considered high-priority at the beginning of a cycle, but their results may have only limited impact by the cycle's end. In addition, research projects that continue for 5 years without being re-evaluated may not address new priorities set by the Administration or by Congress.

Specifically, our review of 7 of 29 ARS biofuels research projects disclosed that 3 were targeted toward either process improvements or the identification of saleable co-products to benefit the corn ethanol industry. These projects had been initiated between 2000 and 2004, but outside economic factors allowed the corn ethanol industry to expand and mature even without the benefits of this currently ongoing research. This conclusion was also reached by an independent panel of experts performing a retrospective review of ARS' Bioenergy and Energy Alternatives National Program in 2007. While highly supportive of ARS' biofuels research program overall, the reviewers noted that because corn ethanol was now viable on its own, little or no public

funding for research was justified. We believe that ARS needs to implement a process to evaluate its ongoing research projects during the course of their 5-year cycles, initiate changes as needed to ensure that the agency's efforts are targeted toward the most promising areas of research, and ensure that projects address the concerns and priorities set out by the Administration and by Congress.

In addition, ARS did not accurately report renewable energy activities related to the AEI for fiscal year 2006 because agency officials did not base their report on the revised guidelines for inclusion provided by the Office of Budget and Program Analysis. As a result, an additional 26 potentially-eligible research projects were not reported, and the \$20.7 million in renewable energy spending related to the AEI may need to be substantively revised.

**Recommendations
In Brief**

We recommended that ARS officials establish a process to review all research projects on a periodic basis to evaluate their continued relevancy and productivity in terms of meeting Departmental and Administration energy goals. We also recommended that ARS officials develop and implement procedures for reporting renewable energy activities using the appropriate guidelines, and for responding to future information requests in an adequate manner.

Agency Response

In their response dated April 28, 2008, agency officials generally agreed with the findings and recommendations contained in the report. We have incorporated applicable portions of the ARS response, along with our position, in the Findings and Recommendations section of the report. The agency's response is included in its entirety as exhibit B of the report.

OIG Position

Based on the response, we were unable to reach management decisions for either of the report's two recommendations. Management decisions can be reached once we receive the information specified in the Findings and Recommendations section under **OIG Position** of this report.

Abbreviations Used in This Report

AEI	Advanced Energy Initiative
ARS	Agricultural Research Service
NPS	National Program Staff
OBPA	Office of Budget and Program Analysis
OIG	Office of Inspector General
OSQR	Office of Scientific Quality Review
USDA	United States Department of Agriculture

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Background and Objectives

Background

The Agricultural Research Service (ARS) conducts scientific research to develop, and to transfer to the public, solutions to agricultural issues of a high national priority such as renewable energy activities. It conducts research internally, with non-Federal entities through cooperative agreements, and with other Federal agencies through interagency agreements. ARS administers its programs through its national offices in Washington, D. C. and Beltsville, Maryland. The national office and 8 area offices provide direction and monitor ARS research activities at 12 research centers, 6 human nutrition centers, and 294 research units in 110 locations.

The Bioenergy and Energy Alternatives National Program purpose is to (1) develop alternative energy sources through increased use of agricultural materials such as feedstocks for biofuels, (2) create jobs and economic activity in America, (3) reduce the nation's dependence on foreign oil, and (4) improve the environment. To assist in fulfilling this mission, the National Program Staff (NPS) develops an action plan at the beginning of each 5-year research cycle that addresses renewable energy research areas considered a high priority by agency managers. This process includes conducting a multi-day workshop with representatives from industry, academia, other United States Department of Agriculture (USDA) agencies, and Federal entities such as the Department of Energy.

Once the priority research areas are identified, research personnel submit detailed project plans that contain projected accomplishments and yearly milestones to be completed. Final approval by the National Program Leader comes only after ARS' Office of Scientific Quality Review (OSQR) reviews each proposed project for scientific quality and feasibility. The first¹ cycle research projects were implemented in 2004 and the second cycle projects will be implemented in 2009 and extend through 2014. However, new research projects can begin during the course of a cycle if new funding for them becomes available.

In recent years, the rising costs and uncertain availability of foreign oil have led to an increased emphasis on bioenergy research to develop sustainable, domestic sources of renewable energy. In particular, the conversion of cellulosic biomass to ethanol is being heavily emphasized as a way to meet the nation's energy needs. This emphasis has led to the passage of key legislation as well as Presidential initiatives, including:

¹ The first cycle began in 1999, with a stakeholder workshop.

- The Biomass Research and Development Act² of 2000 (Act), which provided guidance to Federal agencies conducting biofuel and biobased product research. The Act directed research agencies to develop: (1) technologies and processes necessary for commercial production of biofuel at prices competitive with fossil fuels, (2) high-value biobased products, and (3) a diversity of sustainable feedstocks for conversion to biofuel and biobased products. It also directed research and development toward developing technologies for converting cellulosic biomass into intermediates that can be converted into fuels;
- The Energy Policy Act³ of 2005, which was the first Federal energy law to mandate utilization of renewable fuel goals to reduce the nation's dependence on foreign oil.⁴ USDA incorporated goals into its strategic plan mandating that ARS research support the development of new markets and products for agricultural materials, and facilitate the achievement of Presidential initiatives through the production of renewable energy; and
- The President's Advanced Energy Initiative (AEI),⁵ which called for emphasis on the breakthrough technologies needed to make cellulosic ethanol cost-competitive with corn-ethanol by 2012.

In fiscal year 2006, ARS reported to the Office of Budget and Program Analysis (OBPA) that it had 29 ongoing research projects related to biofuels and renewable energy, with total funding of \$20.7 million. ARS is currently planning for its next 5-year research cycle.

Objectives

Our objective was to assess ARS' actions related to renewable energy research. As part of this, we evaluated whether the agency was targeting its research to areas that would have the most impact on addressing the nation's renewable energy needs. We also reviewed the agency's compliance with renewable energy reporting requirements to OBPA.

² Title III of the Agriculture Risk Protection Act, Public Law 106-224, dated June 20, 2000.

³ Dated January 4, 2005.

⁴ This will be accomplished through the production of 7.5 billion gallons of renewable fuel by 2012. As of January 2008, the Energy Independence and Security Act of 2007 requires fuel producers to use at least 36 billion gallons of biofuel by 2022.

⁵ Issued in February 2006

Findings and Recommendations

Finding 1

ARS Needs a Process to Evaluate the Continued Relevance of Its Renewable Energy Research Projects

We found that three of the seven ARS research projects we reviewed produced results that benefited already mature segments of the ethanol producing industry rather than developing new and innovative technologies in the field of renewable energy. We attributed this to the fact that ARS research projects followed a 5-year cycle, and that ARS' annual review process does not evaluate the continued importance or relevance of ongoing research in terms of outside factors such as changing economic conditions. In addition, ARS does not have an effective process in place to determine whether the research emphasizes current renewable energy priorities set by the Administration or by Congress. As a result, ARS research projects that may have addressed worthwhile purposes at the time of their inception may become outdated during their 5-year cycles and thus might not produce the most effective results in terms of developing new renewable energy sources.

Within USDA, ARS is the agency with primary responsibility for conducting research into the development of renewable energy sources. Historically, this has focused on the conversion of corn and other grains into ethanol as a way to reduce the nation's dependence on foreign oil and to make ethanol and other types of energy, such as biodiesel, cost-competitive with petroleum. In 1999, ARS initiated the Bioenergy and Energy Alternatives National Program. Its purpose was to reduce dependence on foreign oil, to improve the environment by developing alternative energy sources, to increase the use of agricultural feedstocks for biofuels, and to create jobs and economic activity in the agricultural sector.

To implement this program, ARS officials met with representatives of its agricultural "stakeholder" industries that are involved in the production of biofuels and alternative energy, along with representatives from academia and other USDA agencies and other Federal entities such as the Department of Energy. Together, ARS and the stakeholders identified problems with solutions that would most benefit the industry and the country. Following this process, ARS initiated a number of research projects to address the identified problems. Because the 1998 Farm Bill required that all research projects be reviewed every 5 years, ARS created the Office of Scientific Quality Review (OSQR) process, beginning in 1999, with research projects following a 5-year cycle.

ARS officials also review the progress of ongoing research projects on an annual basis, using reports provided by the scientific teams who conduct the research. These reports provide information on significant accomplishments during the reporting year as well as the progress made in completing various milestones that were established in the proposals for each research project. The reports are also used to identify the research accomplishments that support ARS' strategic plan as well as the agency's annual budget requests to Congress.

According to a National Program Staff (NPS) official, the reviews of the annual reports concentrate primarily on determining whether the research is resulting in documented accomplishments. These reviews do not include a determination of whether outside factors, such as changing technology or conditions within the industry, may have reduced the value of these accomplishments in meeting the nation's growing needs for renewable energy. In addition, they do not consider whether the ongoing research continues to address current policies and priorities set by the Administration or by Congress.

To improve the quality of its research programs overall, ARS instituted a new retrospective review process, in which a panel of outside experts is called in to review one of ARS' national programs and provide recommendations and improvements for the next research cycle. The first of these reviews for the Bioenergy and Energy Alternatives National Program was conducted in June 2007.

In January 2005, shortly after the end of ARS' first 5-year research cycle,⁶ Congress enacted the Energy Policy Act.³ This was the first Federal energy law to mandate the use of renewable fuel goals to reduce the nation's dependence on foreign oil.⁴ In addition, it was the first to set goals for cellulosic biofuels production, calling for 1 billion gallons in annual production by 2015. The President's 2006 Advanced Energy Initiative (AEI), which followed in February 2006, called upon Federal agencies to "foster the breakthrough technologies necessary to make cellulosic ethanol cost-competitive with corn ethanol by 2012." Cellulosic ethanol can be produced from a wide variety of agricultural sources such as woodchips and switchgrass that would otherwise have only limited value or usefulness. The source materials for cellulosic ethanol come from agricultural sources, making ARS' role crucial in identifying ways to meet the challenges set out by the President and Congress.

⁶ This applies to research performed under the Bioenergy and Energy Alternatives National Program only. Other research programs have different starting and ending dates for their 5-year cycles.

Of the 29⁷ ARS biofuels projects that were ongoing during fiscal year 2006, we reviewed 7 projects being performed at 2 ARS research locations (see exhibit A). Together, these 2 locations accounted for 58 percent of ARS' \$20.7 million in renewable energy research funding for that year. Of these seven, we found three that involved research into corn ethanol rather than newer and more promising areas such as cellulosic biomass. Results produced by this research, even if successful, could be of questionable value because of changes that have taken place within the ethanol industry. Work was still progressing on all three research projects at the time of our field work. On one of these projects, the agency proceeded with research even though its results would not be used for several years, in which time the corn ethanol industry's needs might have continued to change. These are detailed below.

Project 1935-41000-069, Aqueous Enzymatic Extraction of Corn Oil and Value Added Products from Corn Germ Produced In New Generation Dry Grind Ethanol Processes

This project, which was initiated in 2004, expanded on the results of an earlier research project from the 1999-2004 cycle which developed a new process for ethanol wet-mill operators to use in extracting oil from corn germ without the need for a toxic solvent. The new project was intended to develop a comparable extraction process for dry-grind operators that, because they could not extract the oil, could only sell the corn germ to wet-mill operators at a lesser price so the oil could be extracted. It was expected that this would benefit the ethanol industry as a whole by allowing the next generation of dry-grind facilities to produce higher value co-products, including corn oil. This, in turn, would decrease the cost of producing ethanol, making it competitive with petroleum.

However, in the interim, economic factors had brought about significant changes in the industry. The rising demand for ethanol and the resulting higher market prices allowed dry-grinding operations to proliferate even without ARS' new extraction process. The number of dry-grind ethanol producers almost doubled between 2003 and 2007, when 104 of the 131 ethanol producers nationwide (79 percent) were identified as dry-grind operations. ARS' annual reviews, which concentrated on the completed milestones and the fact that the project was producing results, did not consider whether those results were still critical to advancing the development of renewable energy.

⁷ ARS listed 29 biofuels projects in fiscal year 2006, but one of these was an actually an administrative account for salaries related to technology transfers and another was a Congressionally-mandated corn ethanol program for which funds were specifically earmarked through legislation.

Project 1935-41000-072, Economic Competitiveness of Renewable Fuels Derived from Grain and Related Biomass

One of the four objectives for this project, which began in 2000, was to develop a process for treating corn with ammonia to facilitate removal of the hull and thereby lower the cost of conversion to ethanol. The process was demonstrated successfully on a small scale in 2003, so the agency decided to continue the research in the next cycle to increase the scale of the process. When ARS initiated new research in this area in the beginning of the next cycle (2004), the research concentrated on further development of the ammonia process, including the construction of a pilot plant-scale corn ammoniation device. However, the expansion of the ethanol market had occurred as early as 2003 and resulted in a rapidly maturing industry. Therefore, its need for such research from public funds began to decline. By 2004, when ARS officials made the decision to continue work in this area, we believe that the agency's resources could have been more effectively used in areas other than corn ethanol.

Project 1935-41000-070, Enzyme-Based Technologies for Milling Grains and Producing Biobased Products and Fuels

One of the goals of this project, initiated in 2002, was to develop a process using enzymes rather than sulfites in the wet milling process and adapt the same process for the dry grind process of converting corn to ethanol. Significant results were obtained, including the creation of an enzymatic wet-milling process model that was tested in a Malaysian corn milling plant in August of 2005, and a negotiation of a commercial license for this technology.

The results produced by this research are, in general, those anticipated by ARS. However, they will only benefit the corn industry if used in the new construction of wet mill plants or if existing plants are adapted at additional cost. In addition, this research primarily aids the existing corn ethanol industry, so the benefits of this research would be of little significance in meeting the goals of the 2005 Energy Act or the AEI of 2006.

ARS' first retrospective review by a panel of outside experts in June 2007 was generally supportive of the agency's research efforts on renewable energy. However, its report⁸ also concluded that the corn ethanol industry is now viable on its own and that little or no continued investment of public research funds is justified. The report also concluded that cellulosic ethanol

⁸ Assessment Panel Report, issued in August 2007

merits greater attention and research investment than it has yet received from ARS. Reviews such as these, which are not limited to evaluating internal benchmarks, could be valuable tools to ARS in evaluating the merit of ongoing research projects. This is particularly true if they are performed on a more frequent, preferably annual, basis.

ARS was already performing research related to cellulosic biomass at the time the AEI was issued in February 2006. Much of the research in our review, performed during 2006, was either directly or indirectly related to cellulosic biomass. However, the results of our review revealed that at the same time, ARS continued to conduct research into areas such as corn ethanol which had been superseded by more promising avenues of research and were unlikely to produce the results outlined in the President's AEI. ARS' existing annual review process does not evaluate ongoing projects for their continued relevance to updated priorities such as the AEI. Thus, the agency has continued with the research projects that were ongoing when the AEI was issued and is only now beginning the process of preparing for the next 5-year research cycle. Any resources committed to ongoing projects that do not target critical areas of research would not be redirected into new projects until 2009, or 3 years after the President issued the AEI. This late start reduces the potential effectiveness of the new research in meeting the 2012 timeframe identified by the President. Although ARS may be devoting even more of its resources to the areas highlighted in the AEI by 2009, unforeseen conditions could arise between then and the end of the cycle in 2014 that would again call upon agency officials to make changes in the direction of its renewable energy research during the course of a 5-year cycle.

ARS officials stated that much of their research into "mature" areas such as corn ethanol is related to identifying profitable uses for the byproducts of the ethanol production process, which are essential because they reduce the cost of ethanol. They noted that market factors are not yet driving the industry to perform this kind of research, indicating it should still be performed by ARS. However, this is not reflected in the conclusions reached in the 2007 retrospective review. In addition, the examples we note in our report were primarily directed toward improving the production processes themselves rather than to identify marketable uses for byproducts.

With the emphasis on cellulosic research as outlined in the AEI, we believe it is incumbent upon ARS, with its unique competencies for performing agricultural research, to be as responsive as possible to new policies and priorities set by the Administration and by Congress. In addition, agency officials need to ensure that their research dollars and scientific resources are targeted toward the most productive areas in terms of developing renewable energy resources and to be flexible in addressing emerging issues and objectives. As a result, we believe that ARS needs to implement review

processes to ensure that its research projects are as effective as possible in achieving the energy goals of the Administration and the Department.

Recommendation 1 Establish a process to review all research projects on a periodic basis, and to evaluate their continued relevancy and productivity in terms of meeting departmental and Administration energy goals.

Agency Response The ARS response dated April 28, 2008, states that this fiscal year the agency will revise the ARS form 421, Annual Report Form, to solicit more explicit reports on each project's progress toward national program goals. It further states that this progress will be assessed by the National Program Leaders.

OIG Position Although we concur with agency officials' proposal to use the annual reporting process to address the recommendation, the response does not state what additional information will be collected under the revised form, or what guidelines will be provided for its evaluation. As noted in the finding, we believe that to be effective the review process would need to consider factors that are not currently included. To reach a management decision, ARS officials need to provide a response that addresses these concerns.

Finding 2 **Renewable Energy Research Activities Misreported**

ARS did not accurately report renewable energy activities in accordance with the guidelines provided by the Office of Budget and Program Analysis (OBPA). This occurred because agency officials had not placed a sufficient priority on identifying projects that met OBPA's guidelines, and instead reported only the 29 projects listed in agency records as being associated with renewable energy. However, officials had not yet determined the reporting eligibility of 26 additional projects identified by the agency's NPS as contributing to the AEI. As a result, the \$20.7 million that ARS reported to OBPA as being used to fund renewable energy research in fiscal year 2006 may need to be revised.

In 2006, on behalf of the USDA Energy Council, OBPA collected information from ARS and other agencies on the extent to which program funds were spent on energy-related programs and activities. To assist the agencies in providing full and complete information, OBPA provided guidance to assist the agencies in identifying the types of projects that were to be reported. In response, ARS reported to OBPA the 29 research projects under its Program Code 026, Biofuels, with total expenditures of \$20.7 million in FY 2006.

However, we found that agency officials had made their report to OBPA without first making an accurate identification of those projects that qualified for inclusion in the report. Based on OBPA guidance, we found that the NPS had previously compiled another list of research projects that had been identified as contributing to the President's AEI. This list of 26 projects had not yet been reviewed and approved by responsible agency officials, and thus had not been used when developing the report to OBPA. ARS officials stated that these were not included in the report to OBPA as renewable energy research activities because they had not made it a priority to identify and code research projects based on the new guidance provided by OBPA in 2006. At the time of our audit, officials had still not verified that all of these projects should be included in the OBPA reports. As a result, some of these may have met the OBPA guidelines and thus been eligible for inclusion.

In order to assure accurate reporting of this information, ARS officials need to implement the necessary processes for the agency to timely and accurately respond to OBPA or other Departmental requests for information of this type.

Recommendation 2 Develop and implement procedures for reporting renewable energy activities using the appropriate guidelines.

Agency Response ARS officials stated that the agency is working with OBPA to address this issue and to ascertain that all bioenergy programs are being reported in accordance with the new definitions and example activities provided by OBPA. They also stated that a comprehensive list of research projects contributing to ARS Bioenergy and Energy Alternatives Research was provided to OBPA in February 2008. The agency is in the process of making necessary corrections to its research project coding to address future budget reporting.

OIG Position We concur with the actions being undertaken by ARS. However, to reach a management decision, ARS officials need to provide information indicating the timeframes that ARS procedures will be developed to incorporate the new definitions and examples provided by OBPA, and when research project coding will be completed to address future budget reporting.

Scope and Methodology

We performed our audit at ARS' National Office in Beltsville, Maryland, two Area offices, and two research centers located in Peoria, Illinois, and Wyndmoor, Pennsylvania. These two centers accounted for 13 of the 29 ARS biofuels research projects ongoing in fiscal year 2006. We judgmentally⁹ selected three of five projects administered by the Wyndmoor research center and four of eight projects administered by the Peoria research center. We conducted fieldwork from April through September 2007. Our review concentrated on 2006 operations and included prior year activities of selected projects as necessary.

We conducted this performance audit in accordance with generally accepted *Government Auditing Standards*. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

At ARS Headquarters, we interviewed NPS and other officials responsible for renewable energy/biofuels research. We evaluated ARS policies and procedures related to the selection, approval, and monitoring of renewable energy research. We also interviewed officials and evaluated procedures in place to prevent the duplication of work between multiple research projects. We reviewed Scientific Quality Panel reviews to evaluate their adequacy and ARS' response. We reviewed and evaluated the annual progress reports submitted for the seven sampled projects.

At the two area offices and research centers, we interviewed area office directors and research leaders. We reviewed the judgmental sample of projects to ensure that they were related to renewable energy and addressed the areas of research called for by recent legislation and the President's AEI of 2006. As part of this, we reviewed project proposals and their documented objectives and methodology and interviewed research leaders to obtain a sufficient understanding of these proposals to make our conclusions about each project. We also reviewed the process for cooperative agreement approval and determined whether the agreements associated with our sampled projects contributed to renewable energy research.

⁹ We based selection of area offices and projects on research projects with highest renewable energy dollar funding.

Exhibit A – AUDIT LOCATIONS VISITED AND PROJECTS REVIEWED

Exhibit A – Page 1 of 1

LOCATION	PROJECT NUMBER	PROJECT TITLE	BIOFUELS FUNDING
ARS Headquarters Beltsville, Maryland			
Midwest Area Office and Midwest Center for National Agricultural Utilization Research Peoria, Illinois ¹⁰	3620-41000-118	Industrially Robust Enzymes and Microorganisms for Production of Sugars and Ethanol from Agricultural Biomass	\$1,880,708
	3620-41000-121	Microbial Catalysts to Produce Fuel Ethanol and Value Added Products	\$1,362,172
	3620-41000-122	Cost-Effective Bioprocess Technologies for Production of Biofuels from Lignocellulosic Biomass	\$1,362,172
	3620-41000-124	Improving the Performance of Alternative Fuels and Co-Products from Vegetable Oils	\$1,529,628
North Atlantic Area Office and North Atlantic Area Eastern Regional Research Center Wyndmoor, Pennsylvania	1935-41000-069	Aqueous Enzymatic Extraction of Corn Oil and Value-Added Products from Corn Germ Produced in New Generation Dry-Grind Ethanol Processes	\$836,596
	1935-41000-070	Enzyme-Based Technologies for Milling Grains and Producing Biobased Products and Fuels	\$872,720
	1935-41000-072	Economic Competitiveness of Renewable Fuels Derived from Grains and Related Biomass	\$2,263,634

¹⁰ Co-located with ARS Research Center

Exhibit B – AGENCY RESPONSE

Exhibit B – Page 1 of 2



APR 28 2008

SUBJECT: Response to Audit Report *Implementation of Renewable Energy Programs at the Agricultural Research Service*

TO: Robert W. Young
Assistant Inspector General for Audit
Office of Inspector General
Attn: 02601-0002-Ch

FROM: Edward B. Knipling *Edward B. Knipling*
Administrator

On March 25, 2008, I received the subject report. Thank you for the opportunity to respond for the record.

The report summarized the following recommendations on page 4:

“[w]e recommended that ARS officials establish a process to review all research projects on a periodic basis to evaluate their continued relevancy and productivity in terms of meeting Departmental and Administration energy goals. We also recommended that ARS officials develop and implement procedures for reporting renewable energy activities using the appropriate guidelines, and for responding to future information requests in an adequate manner.”

ARS has the following responses to the main recommendations of the report:

1) Periodic project review: the National Program Staff (NPS) has responsibility for oversight of the national research programs. Progress toward program goals is monitored annually through annual project reports from all over the Nation, which are compiled into National Program Annual Reports by the National Program Leaders (NPL). This fiscal year, we will revise the ARS form 421 (Annual Report Form) to solicit more explicit report on each project's progress toward national program goals. This progress will be assessed by the NPL.

As to the specific projects mentioned in the report, project 1935-41000-069 Aqueous Enzymatic Extraction of Corn Oil and Value Added Products from Corn Germ Produced in New Generation Dry Grind Ethanol Processes, project 1935-41000-072 Economic Competitiveness of Renewable Fuels Derived from grain and Related Biomass, and project 1935-41000-070 Enzyme-Based Technologies for Milling Grains and Producing Biobased Products and Fuels will not be substantially changed in response to the subject Audit. ARS program managers believe that by performing research that enables either a reduction in processing costs or the production of higher-value co-products by corn-ethanol distillers, ARS helps these distillers remain

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Washington D.C. 20250-0300

commercially viable if and when raw material prices go up and/or product ethanol prices go down. The economic benefits of this research are evident today. Prices for agricultural commodities, and especially corn grain, are at all-time highs. In addition, prices for fuel ethanol are stagnant or decreasing as the production capacity for ethanol reaches levels that run up against physical distribution limits and market saturation. The ARS research for co-products from first-generation biorefineries, such as ethanol distilleries, will help distilleries maintain their operating margins and stay in business. Research that takes out costs or creates additional value for a value-added chain can only help the long-term viability of all the industries – in this case, from seed to pump – serving that chain. Improving corn starch conversion efficiency reduces the amount of corn needed for fuel, reducing ethanol competition with food and feed.

2) Reporting procedures: the Budget and Program Management Staff (BPMS), the NPS, and the USDA Office of Budget and Program Analysis (OBPA) are currently working to address this issue and to ascertain that all bioenergy programs are being reported in accordance with the "new" definitions and example activities which OBPA provided as a guide in developing the agency crosscut. A comprehensive list of research projects contributing to ARS Bioenergy and Energy Alternatives Research was provided to OBPA in February 2008, and we are in the process of making necessary corrections to the research project coding to address future budget reporting.

Thank you again for the opportunity to respond to the draft report. I look forward to receiving the final version.