

**NATIONAL AGRICULTURAL RESEARCH, EXTENSION,  
EDUCATION, AND ECONOMICS ADVISORY BOARD**

**GENERAL MEETING AND FOCUS SESSION:  
*Bioenergy and Germplasm***

**March 7-9, 2006**

**Channel Inn Hotel, 650 Water Street, S.W., Washington, DC**

**MINUTES**

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**TUESDAY, MARCH 7, 2006**

## **GENERAL SESSION**

### **Welcome and Introductory Remarks**

Martin Massengale, Chairman, National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board (the Board), called the meeting to order at 1:00 p.m and asked those in attendance to introduce themselves (see attached list). Massengale noted that the minutes of October 2005 meeting had not be distributed in advance of meeting, but he suggested that the minutes be adopted as submitted, subject to corrections and modifications made before the end of the meeting.

Joseph J. Jen, Under Secretary for Research, Education and Economics (REE), USDA, announced that this will be his last meeting with the Board; he is returning to California Polytechnic Institute. Jen's replacement is to be Gale A. Buchanan, former dean of the University of Georgia College of Agricultural and Environmental Sciences, whose nomination will be submitted to the Agriculture Committee on March 14, with confirmation to follow before March 28. Jen also noted several other personnel changes in REE:

- Deborah Hanfman, Executive Secretary, NAREEE Office, has asked to be reassigned for health reasons; while a replacement is sought, her place will be taken on an acting basis by Jim Spurling, formerly of the REE Legislative Affairs Office;
- Lowell Randall has assumed the post of Director, Legislative Liaison and Intergovernmental Affairs, REE;
- Merle D. Pierson has assumed the post of Deputy Under Secretary, REE.

### **REE Agency Updates**

Ed Knipling, Administrator, Agricultural Research Service (ARS), reported that the ARS budget for FY 2006 is essentially flat, and the proposed budget for FY2007 includes an 11-percent reduction for ARS, with another 10 percent "redirected" to other purposes within USDA. ARS is currently struggling to repair flood damage at the Southern Regional Research Center in New Orleans. Obesity research, the topic of a recent NAREEE meeting, is also the topic of the March 2006 issue of *Agricultural Research*. A recent article in *The Scientist* rated ARS one of the ten best places to work in Washington, DC. Knipling also introduced Karen Baird, the new Director of Legislative Affairs, ARS.

Several Board members commended ARS on the progress it has achieved in implementing scientific peer review, which Knipling described as a system of prospective quality assurance. He reported that 79 percent of the projects reviewed required moderate, minor or no modification, and that peer-reviewed research (as a kind of competition) gets a higher ranking from the Office of Management and Budget. In addition, ARS scientists and postdocs published about 5,000 peer-reviewed articles in 2005, or about two per researcher. The economic impacts

of this research might not be felt for ten years, but a number of studies have indicated that the rate of return on agricultural research is very high, anywhere from ten- to fifty-fold over time.

Colien Hefferan, Administrator, Cooperative State Research, Education and Extension Service (CSREES), reported that the Expanded Food and Nutrition Education Program (EFNEP) remains one of her agency's leading success stories, producing measurable and sustainable increases in fruit and vegetable consumption among participating families. But while EFNEP receives a small increase in the President's FY2007 budget, overall extension activities are cut by 14 percent, and research activities by over 15 percent. Hefferan believes that, despite this lack of budget growth, CSREES can still achieve its goals. The agency has recently expanded its collaborative research on crop and zoonotic diseases, including soy rust, avian flu and swine flu; another new collaboration with the National Science Foundation will focus on microbial environments. Herreran estimated that CSREES now leverages \$40 million per year from other federal agencies to support its activities.

In response to questions, Hefferan added that land grant universities and colleges (LGUs) "remain reluctant to embrace" the Administration's new emphasis on competition instead of formulas, which may have been introduced too abruptly. Nevertheless, she believes that this shift will go forward over the next 5 years. She defended the traditional distinction between public research and private applications, although she added that – given the level of underinvestment in agricultural research – there is very little duplication or overlap.

Susan Offut, Administrator, Economic Research Service (ERS), reported that the best estimate of return on investment in agricultural research is between 15 and 18 percent per year, even when negative impacts such as water quality are taken into consideration. ERS research indicates that the productivity index for agriculture is currently leveling off, demonstrating a 10- to 15-year lag from the historic decline in public investment in agricultural research. This measure is driven largely by commodity prices, however, and may underreport nutritional and environmental benefits. The ERS is due to increase by 10 percent in FY2007, and the agency seeks further increases (including external sources) to fund increases in data acquisition. ERS will increase its reporting on rural economic development and on food consumption away from home.

In response to questions, Offut said that ERS needs better measures of return on investment, such as quality of life and other nonmarket outcomes. The agency also seeks better data on what people eat in restaurants – not just what they serve, but how much they serve, and how much the customer consumes. One barrier to data gathering is Wal-Mart, a large retailer that does not participate in Department of Commerce price surveys.

Ron Bosecker, Administrator, National Agricultural Statistics Service (NASS), reported that the 2007 Census of Agriculture, now being tested, will include a sharper focus on aquaculture, organic food, agrotourism and recreation, energy generation, and practices *within* Indian reservations (previously treated as unit producers). These data will be broad but shallow, with followon surveys (budget permitting) to obtain more details on such topics as land ownership, horticulture, irrigation, orchards and vineyards, and organic agriculture.

In response to questions, Bosecker said that the Census takes about two hours to complete, but that the response rate is 84 percent; this is helped by the fact that response is required by law. Horticulture would include nurseries, greenhouses and flowers; specialty crops in general are represented by production measures, not processing or packaging. Losses due to disaster are represented only by insurance data. NASS seeks to convert the Census to an electronic version, similar to TurboTax, that guides the respondent through an interview and allows him to skip ahead when possible.

### **USDA/REE Responses to Advisory Board Recommendations**

Merle Pierson, Deputy Undersecretary for REE, USDA, reported that zoonotic diseases, the subject of a Board focus session and recommendations in September 2003, has become a department-wide concern. In the case of bovine spongiform encephalitis (BSE, “mad cow disease”), the immediate response was for the Animal and Plant Health Inspection Service (APHIS) to expand testing of domestic and imported beef. However, USDA was able to develop and publish new rules in an unprecedented 12 days, based largely on the scientific foundation provided by prior ARS research. In the case of H5N1 avian influenza (“bird flu”), REE represents USDA in a joint planning effort that includes the Departments of Interior, Homeland Security, and Health and Human Services (DHHS). These partners recently completed a tabletop exercise to test several response scenarios, and Pierson said that – while a large outbreak would stress the system – a plan is in place that should be able to cope with a “reasonable” outbreak at several locations.

In response to questions from the Board, Pierson said that interagency cooperation on H5N1 benefits from the model of mad cow, but that USDA has not approached the National Institutes of Health (NIH) on the general subject of zoonotic diseases, and that contacts with NIH (and DHHS generally) have proven to develop. On the subject of stimulating rural entrepreneurship, Pierson said that USDA needs evidence-based data to guide policy and programs. CSREES is already addressing this topic, and ERS plans to hold a national conference this fall that will address both the economic and sociological perspectives. Staff will send materials on this conference to Board members and seek their input.

### **Budget and Legislative Issues for the REE Mission Area**

Sarah Mazie, Budget Coordinator, REE, USDA, reported that all four REE agencies have scored at least “moderately effective” in the ongoing Program Assessment Rating Tool (PART) review, while many other USDA agencies and programs have been rated “efficiency not established.” PART, which requires objective investment standards, such as relevance, productivity and effectiveness, has proven to be a useful management tool.

REE budgets remain as tight as ever in FY2007, as do research budgets generally, as the Administration seeks to reduce the budget deficit by 50 percent within 5 years. During 1976-2002, most of the growth in the federal research budget was in NIH; during 2002-2006 it has

been at Homeland Security; and the recently announce President Research Competitiveness Program emphasizes the physical sciences, with most of the new money going to the National Science Foundation, Office of Energy Research, and National Institute of Standards and Technology.

Within USDA, REE represents 2 or 3 percent of the total budget, while food assistance programs represent 56 percent. ARS and CSREES will take hits in FY2007, unless Congress puts back the earmarks that are excluded from the President's budget. However, REE will receive increases for avian flu and for food and agricultural security. Other major themes in the FY2007 budget are nutrition and obesity, and genomics. The National Agricultural Library will receive added funds for programs, not facilities.

Several Board members suggested that support for feeding programs and commodity supports should not overshadow the need for increased investment in agricultural research. Chairman Massengale reminded members that, while neither USDA nor the Board can lobby Congress, members can nevertheless urge their own constituencies to support changes in the allocation of research funds to REE agencies.

### **Specialty Crop Committee**

Walt Armbruster, Chairman, NAREEE Specialty Crops Committee, distributed a draft report with the findings of the committee's October 2005 listening session and other research. Importantly, the designation "specialty" or "noncommodity" belies the diversity and vigor of the sector. Specialty crops represent only 3 percent of the harvested acres in the United States, but fully 40 percent of the total value of production. The value of horticulture production has also doubled in the past 15 years. The relatively high yields of these crops resist the loss of farmland to urban sprawl, and they have significant ecological benefits as well. However, these crops face increasing competition from abroad, especially in such areas as fresh vegetables and melons, off-season crops, and rare species. While one cannot conclude that this sector is less competitive, it certainly deserves more attention and support. Among the recommendations of the draft report: public-private partnerships are needed to support research and extension in several areas that are vital to the future of this sector, including biotechnology, pesticides and pest management, improved irrigation and mechanization, the development of new products and uses, and improved marketing. Armbruster estimated that a final version of the report would be ready within two weeks.

In response to questions, Armbruster reported that producers and processors in the specialty sector feel that they are "orphan crops" who receive less attention than they deserve from ARS and LGUs. They would like to see something specific about specialty crops in the 2007 Farm Bill. Members suggested that the report could make their case more convincingly if it contained more examples and case studies.

The meeting recessed for the day at 5:45 p.m.

**WEDNESDAY, MARCH 8, 2006**

Martin Massengale called the meeting to order at 8:00 a.m. and introduced the Secretary.

**Mike Johanns**, Secretary, USDA, reported that agricultural research is an important part of the Administration's larger focus on research. Science is what makes farmers efficient, and the enormous productivity gains of U.S. agriculture are proof of the importance of agricultural research. Today the American farmer faces new challenges, including global competition and global diseases such as BSE and H5N1. During 52 listening sessions in preparation for the new Farm Bill, USDA has heard from stakeholders about concerns such as free trade, market access, and phytosanitary standards. They have also heard concerns about disparities in farm payments – five commodity crops get 90 percent of all subsidies, while specialty crops representing 50 percent of the value of U.S. crops receive little or no subsidy. Indeed, two-thirds of all American farmers receive no subsidies because they grow non-program crops. These producers need research and assistance, not subsidies. USDA needs to invest in new crops and new markets that will help these mostly small and medium size farms succeed.

Energy has been another important topic in the listening sessions. The President recently said that Americans are “addicted” to foreign petroleum and called for heightened efforts to develop reliable, affordable sources at home. As a result, the opportunities for ethanol have never been higher. Already 14 percent of the corn crop goes to ethanol, a figure that should rise to 22 percent by 2010, and biodiesel production should also double by 2010. These changes should raise the price of corn by 5 to 10 cent per bushel. The Administration is committed to the success of these and other bioenergy technologies, and he looks forward to hearing the Board's thoughts and advice on this topic.

## **FOCUS SESSION – BIOENERGY AND GERMPLASM**

### **Bioenergy Presentations**

Gassem Asrar, former member of the Board and currently Deputy Administrator for Natural Resources and Sustainable Agricultural Systems (NRSAS), ARS, reported that USDA has created a Bioenergy Council that reports directly to the Secretary.

Don Erbach, NRSAS, ARS, explained that the five drivers for developing bioenergy are energy security, environment, rural development, national debt, and the balance of trade. In 2005, the United States derived only 2.2 percent of its transportation fuel from ethanol (4.0 billion gallons, all from grain) and biodiesel (70,000 gallons). If technologies for converting cellulose to ethanol can be developed, however, it is estimated that the agricultural sector produces about 1 billion dry tons of potential cellulosic feedstock per year. At an estimated \$40/ton, this represents a potential \$40 billion in farm income, more than the 2005 value of corn and soybeans combined. Forest sources could produce another 370 million tons of cellulosic feedstock per year.

The principal barriers that must be overcome to commercialize this and other bioenergy technologies include the following:

- Cost (including the external costs of environmental and security impacts);
- Emissions (ethanol is highly volatile, and its combustion produces volatile organic compounds);
- Quality;
- Energy efficiency (at present, fossil fuels are consumed in the production of biofuels); and
- Availability of sustainable feedstocks, distribution infrastructure, and vehicles designed to use biofuels.

The quickest way to overcome these barriers is to face a crisis.

ARS pursues relevant research under National Program 307, Bioenergy and Energy Alternatives, which includes ethanol, biodiesel, energy crops, and energy alternatives for rural practices. At present the major focus of this research is on improved feedstocks, conversion technologies, and value-added coproducts. The overall goal is to ensure not only the quality and efficiency of the process, but also its sustainability and its benefit to the rural economy.

Carmella Bailey, National Program Leader, Agricultural Materials Program, CSREES, reported that most CSREES-funded research on bioenergy focuses on conversion processes, including pretreatment and catalysts. Major programs are located at the Universities of Idaho and Minnesota and at SUNY-Syracuse. Current funding comes from the research title of the 2002 Farm Bill. The Energy Policy Act of 2005 authorizes \$200 million/yr in additional funds, with 15 percent going to applied research, 35 percent to innovation, and 50 percent to demonstration projects. The goal of these programs is to produce 7.5 billion gal. of ethanol by 2012 (roughly 3.5 times 2005 levels), with a minimum of 250 million gal/yr from cellulose by 2013.

Chavonda Jacobs-Young, National Program Leader, Value-Added Biobased Products, CSREES, described several competitive research programs in biofuels. For example, National Program 71.2, Biobased Products and Bioenergy Production, received 198 proposals for only \$5.5 million in funding in 2005. This program focuses on improved feedstocks, including trees that have higher cellulose content and lower lignin. CSREES uses the Small Business Innovation Research Program to encourage development and commercialization of the resulting technologies. It also collaborates with the Department of Energy (DOE) to sponsor international workshops and encourage research in areas such as maize genomics, metabolic engineering and microbe engineering. In response to questions, Jacobs-Young explained that current ethanol technology, which uses the starch from corn as a feedstock, puts bioenergy in competition with other food and industrial uses of corn. Future refineries will be engineered to exploit multiple feedstocks and produce energy as one of a spectrum of products.

Several Board members observed that achieving the goal of 7.5 billion gal/yr by 2012 would require an initiative on the scale of the Manhattan Project, which in turn will require far more than the current level of interest and commitment. Staff replied that this was the mission of the USDA Bioenergy Council, which will address not only the technological and economic barriers

but also the necessary national will to change. However, this research is “outside the purview” of ERS, which treats bioenergy as an exogenous factor that impacts the corn market. The relevant research will likely be carried out by the Energy Information Administration at DOE.

Members suggested that USDA benchmark its bioenergy programs against the successful programs in Brazil and Norway. There was disagreement on how bioenergy would affect land use, with some members feeling that the shift from grain to cellulose feedstock could actually reduce the acreage devoted to corn. Members welcomed the focus on sustainability and environmental impacts but were concerned with the possible impacts on rural economies and communities. Smaller scale, distributed production would be best for rural development, but cellulose-based processes may require economies of scale; perhaps pretreatment would be an opportunity to capture some of the value locally. Others suggested that DOE is only looking at displacing petroleum, and that USDA’s input would be needed to keep rural development on the agenda.

### **Bioenergy Working Groups**

The Board recessed into two working groups that discussed bioenergy in greater details and then reported back the following points for consideration by REE:

- The current level of investment is probably inadequate to achieve the stated goals of U.S. bioenergy research, nor does there appear to be a central roadmap to guide interagency collaboration.
- A holistic, systems approach is needed to provide the information needed to guide policy. In particular, the current analysis doesn’t seem to pay adequate attention to sustainability, coproducts, nonmarket costs, or effects on rural communities and economies. These are difficult questions, but they can be modeled, indeed they must be modeled in order to evaluate policy options.
- USDA is uniquely well-equipped to conduct this broader analysis and thus contribute to a broader, better-informed policy.
- USDA’s Rural Development mission area, which is currently responsible for the Biomass R&D Initiative, may not have the resources to manage an expanded bioenergy initiative. REE should offer to support Rural Development where necessary, but REE itself is the logical home for bioenergy research within USDA.
- REE should enhance its role with USDA’s bioenergy activities, and USDA within the federal government’s activities, to ensure that policy is well informed and rural interests are protected. However, USDA should not put a “rural development face” on its energy initiatives.
- Bioenergy products and coproducts might be a good topic for a focus session during the Board’s October 2006 meeting.

### **Germplasm Presentations**

Peter Bretting, North Central Region Plant Introduction Station, ARS, reported that five of the 22 ARS national programs support research involving germplasm. The largest is NP301, Plant,

Microbial and Insect Genetic Resources, Genomics and Genetic Improvement, with a budget of \$128 million/yr. Plant germplasm is the oldest activity and focuses on crop plants, collecting and preserving genetic information in 18 genebanks for use by plant breeders. Microbial germplasm activities, centered in Peoria, includes industrial and pharmaceutical microbes. Insect germplasm is the newest activity. Animal germplasm activities are conducted not only under NR301 but also under NR101 (Food Animal Production) and NR105 (Animal Well-Being and Stress Control Systems), which between them support about \$40 million/yr in relevant activities. The animal germplasm network includes 12 regional centers, with a central hub at Fort Collins CO, a facility that was launched in 2002. As with plants and microbes, the goal of these activities is to collect, characterize and conserve genetic material from useful animal species, along with such genetic and geographical information as to add to the value of the collection.

Ann Marie Thro, National Program Leader, Plant Breeding and Genetics, CSREES, described the National Plant Germplasm System (NPGS) as a three-way partnership among ARS, CREES and the State Agricultural Experiment Stations (SAESs). The CSREES share of this program, about \$3 million/yr under Knowledge area 201, supports collection, characterization and utilization work at four regional centers on crops of regional significance. Another CSREES program, Knowledge Area 202, spends about \$10 million/yr on genetic research in such areas as insect resistance and germplasm from foreign sources. The CSREES animal germplasm program is relatively new; it supports travel by the chairmen of six regional SAES committees. CSREES is also developing a microbial germplasm program that will focus on plant-microbe associations.

Sam Foster, former Board member and Forest Geneticist, U.S. Forest Service (USFS), explained that USFA germplasm activities have a similar mission, organization and techniques. In the research area, USFA emphasizes productivity and disease resistance. In the National Forest system, the emphasis is on adaptation, yield and disease resistance. In state and private forestry, the emphasis is on developing genetically superior stock for planting and replanting. USFS coordinates these activities through tree improvement cooperatives, and it operates both field trials to test new strains and seed orchards to develop stock for reforestation. Future directions may include native plants, invasives, and threatened or endangered species. USFS feels that its close banks are in decline, and it will need to reorganize its seed collections to support its mission. USFS research funding comes from the Department of the Interior, rather than USDA.

In response to questions from the Board, the presenters added that ARS distributes about 120,000 samples of plant germplasm per year from its collection of 460,000 accessions; between a quarter and a third of these samples to foreign recipients, including scientists, breeders and physiologists. Distribution of microbial samples is similar but operates under greater restrictions to homeland security rules. Animal germplasm remains primarily private in both holdings and distributions and is far more difficult to track. For security reasons, samples are kept in at least two locations, with Fort Collins being the most secure repository. Domestic rather than foreign terrorists are the biggest threat – USFS sites have been attacked by the Earth Liberation Front.

Presenters see a growing need for more and better characterization data to accompany the materials in their collections. There is some conflict between the imperatives to collect additional samples versus preserve the core collection. They receive guidance on this and other management questions from users and from 40 crop germplasm committees, as well as additional advisory groups for animal, microbial and insect germplasm. Access to new samples from international sources is increasingly restricted, for both wild and cultivated species, but the United States maintains open access to its collections as an example to the world.

### **Germplasm Working Groups**

The Board again recessed into two working groups that discussed bioenergy in greater details and then reported back the following points for consideration by REE:

- USDA's plant, animal and microbial germplasm collections, like its Nutritional Information Database, is a unique and vital resource that might be lost for lack of a trivial amount of money.
- USDA should do more to publicize the value of this activity (e.g., its recent successes against soy rust and Holstein inbreeding, or its potential value in responding to climate change) and what would be lost if it disappeared. This should include efforts to make the repositories relevant to urban populations, for example through heirloom crops or horticultural specimens.
- USDA must also ensure that it becomes a research platform to support 21<sup>st</sup> century science, for example better geographic information or better linkages between genetic information and germplasm samples.
- Loss of access to biodiversity hotspots is a potentially serious issue for the future. One possible solution is the concept of "custodial preservation," which separates the accession of a sample from its ownership.
- USDA should support education, training and distance learning programs to ensure a steady supply of personnel to operate and utilize these repositories.

## **GENERAL SESSION**

### **CREATE-21**

During a working lunch, Jeff Armstrong briefed the Board on the activities of Creating Research, Extension and Education Excellence for the 21<sup>st</sup> Century (CREATE-21), an initiative by the National Association of Land Grant Universities and Colleges (NASULGC) to develop a new plan for the partnerships between USDA and universities in pursuit of their research, extension and education missions. CREATE-21 recommends that the current intra- and extramural research, extension and education activities of USDA, along with USFS, be integrated into a new National Institute of Food, Agriculture and Natural Resources (NIFANR). They believe that this will enhance the relevance, responsiveness and sustainability of these activities, thereby improving their competitiveness with other research-oriented entities in the competition for federal funding. Fundamental to this proposal is the conclusion that USDA has not been effective in making a case for its REE mission area. CREATE-21 feels that this institute should be independent, that to leave it in USDA would mean no change and to put it in NSF would be to kill it.

### **Other Board Matters**

Several Board members noted the absence of Deborah Hanfman, who had served as Executive Director of the Board since its creation. They suggested that it would be appropriate for the Board to pass a resolution recognizing her past service. On other matters, they asked for greater access to the budget for Board meetings and other activities and asked if it was possible for the Board to ask Congress to increase their budget, particularly in view of the additional mandates that have been given to the Board, such as the Specialty Crops Committee. Cancellation of a recent listening session was embarrassing to several members, who are eager to avoid this in future.

Staff were unable to provide a cost per Board meeting but said that each conference call costs about \$50. Staff agreed to provide a budget update at each meeting and a quarterly statement of how much money remains in the NAREEE budget. Staff also said that it would be appropriate to ask Congress for additional budget, if the Undersecretary and Secretary agreed. Staff also agreed to respond to several logistical suggestions from Board members, including distribution of briefing books two weeks before meetings, ditto responses to Board recommendations, name tents for meetings, and hard copies of slides or PowerPoint presentations. Staff also agreed to assemble a two-year summary of Board focus sessions, recommendations, and REE responses.

The meeting recessed for the day at 5:00 p.m.

## **THURSDAY, MARCH 9**

### **FOCUS SESSION**

#### **Bioenergy**

In the Board's additional discussion, the following points emerged:

- If the REE research budget is flat, bioenergy may represent an opportunity to ask for and receive new money.
- Manhattan Project results are unlikely to come from a small-scale or distributed effort.
- USDA needs a clearly articulated vision of what its specific mission is with regard to bioenergy.
- There is a need for a more fundamental look at (and modeling of) the entire energy system, including conservation, fuel efficiency and renewable sources, as well as alternatives to gasoline and petrodiesel.
- One goal of USDA should be to push for and facilitate this consideration of the broader consequences of a federal initiative – not just bioenergy, but also its impacts on food systems, rural communities, the environment, etc.
- This initiative comes at a time with an entire generation of scientists is ready to retire. A major new project will require a new generation of researchers and technicians.

In the end, however, the Board felt that it did not have enough information or context to make formal recommendations on this topic. Several members said that they would have liked a broader discussion of this topic, including presenters from DOE and the Environmental Protection Administration and at least an overview of the technologies involved, such as high-temperature enzymes and alternative feedstocks. They also saw the opportunity for more crosstalk between the two halves of the focus session – can USDA research on plant and microbial germplasm shed any light on the topic of bioenergy? Several members suggested that, in future, REE staff should prepare or commission background papers on Board focus sessions, to be distributed with briefing book well in advance of the meeting.

#### **Germplasm**

In the Board's additional discussion, the following points emerged:

- The mission of USDA germplasm programs should include not only genetic material but also individual genes.
- The goal should be to identify specific genes and gene regulators that are responsible for agricultural product quality and resistance to disease, pests and weather losses.
- Consequently, characterization should be understood to include the analysis, preservation and utilization of genomic data, as well as taxonomic and geographical information.
- Here, as in bioenergy, there is the need for a new generation of scientists technicians to generate and utilize this information.
- REE needs to develop criteria for measuring and communicating the value and impacts of these germbanks.

- REE should make a better effort to identify the users of this resource, to determine what they value, and to identify future needs and uses that are still unknown (e.g., the genomics of shelf life).
- A substantial increase in funding for characterization work would probably benefit other sciences, as well. This lends itself to grant programs and might also receive more emphasis in NRI and CSREES programs.
- REE should enhance interactions between genebanks and the health care industry.
- If NPGS charges user fees, they should pay for the system, not the information, and there should be a system of waivers in exchange for past contributions.
- Public relations campaigns in support of NPGS should include its potential value to food security and to nutrition/nutrigenomics.

Here, as in bioenergy, the Board did not feel that it had enough information to make a final or definitive report. Martin Apple suggested that the Board release a preliminary report, with a second report on status and implementation to follow in a year or two.

## **GENERAL SESSION**

### **Subcommittee Reports**

Martin Massengale reminded members that some of their appointments would expire at the end of September, although they are free to reapply and present new letters of support.

The next meeting of the NAREEE Board will be on 24-26 October, 2006. Members suggested a number of possible topics for focus sessions:

- Biomass and bioproducts (coproducts of the bioenergy process);
- 1890s institutions;
- Water, “the new oil” (should include Interior, EPA and state governments);
- Air, “the new water,” and the new rules that impact agriculture, animal herds, and bioenergy.

It was moved, seconded and agreed that the Executive Committee should choose from among these topics.

Tom Fretz reminded the Board that it made a recommendation in October 2005 asking the National Agricultural Library (NAL) to develop a “visioning plan” for a National Digital Library of Medicine. Peter Young, Director, NAL, reported that work has proceeded smoothly on this plan and that a draft will soon be presented to Extension leaders, 1890 institutions, and the American Distance Learning Association. NAL has an 18-month timeline for developing a final action plan. If successful, and if fully funded, it should make the full resources of NAL available to a wider audience in the future.

John Cunningham presented draft recommendations from the Board’s subcommittee on Review and Consultation on USDA protocols. The subcommittee recommends that the Board endorse the CSREES Revised Guidelines for State Plans of Work for the Agricultural Research and

Formula Funds, as published in the *Federal Register* in January 2006. It also recommends that the Board ask CSREES for a briefing on the final guidelines and several specific questions, including comments from other reviewers.

Dave Wehner reported on a first meeting of the Board's subcommittee with Peter Raven, Director, National Arboretum, about its proposed reorganization. The Arboretum's educational mission separates it from REE, and it is administered separately from the system of agricultural and forestry field stations. It receives 500,000 visitors per year but charges no entrance fees. It has been suggested that it the Arboretum should reestablish its national advisory council and make greater use of its active Friends of the National Arboretum group.

Daryl Lund reported that the Relevance and Adequacy subcommittee met over dinner last night to develop an outline of topics for their report, including animal diseases, rural development, infrastructure support, bioenergy, and germplasm repositories, plus NAL and possibly the Arboretum. A draft will be circulated in the near future.

## **ACTION ITEMS**

- REE will provide Board members with information on the proposed ERS conference on rural entrepreneurship and seek their input on topics and participants.
- REE will provide quarterly budget figures to the Executive Committee and a budget update at each Board meeting.
- Gil Leveille will write a paragraph on the "systems approach" to bioenergy.
- Ricardo Rel will write a paragraph on educating the necessary people for bioenergy research.
- REE will compile or commission background papers on the topics of focus sessions, to be distributed with briefing books.
- REE will prepare and distribute briefing books two weeks before Board meetings.
- REE will obtain and distribute hard copies of slides and/or PowerPoint presentations.
- REE will assemble a two-year summary of Board focus sessions, recommendations, and REE responses.