



**The Program for Biosafety Systems (PBS) Announces:  
A Competitive Grants Program on Biotechnology and Biodiversity Interface (BBI)  
Request For Applications, Fiscal Year 2004**

**I. Background and Program Description**

Agricultural crops improved through genetic engineering offer important benefits, including the potential of enhanced agronomic, nutritional, and marketing qualities. Such genetically engineered crop varieties may also be associated with changes in agricultural practices, such as changes in tillage practices, pesticide use, and land use. Similarly, genetically engineered livestock and fish provide the potential for enhanced productivity, meat quality, and disease resistance. Recombinant livestock vaccines can improve disease control and surveillance, and improve productivity and marketability of dairy and animal products, thus enabling economic growth. While these genetic engineering applications of biotechnology provide much promise, they also raise safety concerns, particularly concerns about their impact on health and biodiversity<sup>1</sup>.

While both areas of concern present several questions, many of those relating to environmental impact are more difficult to answer broadly. Thus, the focus of the Biotechnology Biodiversity Interface (BBI) grant program is on the need to better understand the interaction between genetically engineered crops, agriculture, and the environment. Data generated to evaluate concerns about the food safety of genetically engineered products are generally applicable across countries. Developing countries will be able to assess food safety by drawing from regulatory studies conducted in the U.S., Europe, or elsewhere, relying on special studies when needed. However, scientific data on the interaction between the environment and transgenic crops will not necessarily be applicable between countries if they have different crop systems and different species with which crops interact. Environmental risks and benefits, and their applicability to the agricultural realities of different ecological regions, must therefore be assessed on a case-by-case basis.

The BBI program is a component of the Program for Biosafety Systems (PBS). PBS, financially supported by the US Agency for International Development (USAID), is designed to address this need as part of a broader effort to support science-based decision-making and policy development. The Biotechnology and Biodiversity Interface (BBI) competitive grants component will fund biosafety research aimed at addressing the effects of agricultural biotechnology, particularly genetically engineered crops, on natural biodiversity as it occurs in developing countries. The geographic focus of the program is on countries in Asia and Africa, excluding those in which USAID has been prohibited from working. For example, work in and involving collaborators from China is presently not eligible for support.

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<sup>1</sup> For the purposes of this program, "biodiversity" will be used to denote the variety in types of organisms, the numbers of each particular type present, and the role of organisms in wild ecosystem function.



## **II. Purpose of the BBI grants**

BBI grants will support research that provides information needed to 1) assess the potential effects of agricultural biotechnology products on wild biodiversity, in any form, and 2) to design risk management strategies appropriate to developing country agricultural systems, wherever possible drawing upon past experience with how those risks have been managed in traditional agricultural systems.

The information generated by this research should be used to:

- 1) Assist developing country regulatory bodies in making science-based decisions, relying on scientific data on the effects on biodiversity associated with the deployment of transgenic crops in those countries.
- 2) Develop strategies for managing any identified risks in the context of agro-ecosystems found in developing countries.
- 3) Build collaboration between agricultural research and environmental conservation communities.
- 4) Build capacity among developing countries in risk assessment and risk management research.

## **III. Available Funding**

It is estimated that a total \$1.3 million will be available in fiscal year 2004. The range of awards is expected to be between \$50,000 and \$350,000, for research of three to four years' duration. However, larger amounts could be granted for longer-term research if strongly justified and of sufficient significance relative to other proposals. New rounds of awards in future years are subject to availability of additional funding. Awardees will be required to contribute 25% in matching funds from non-US government sources.

## **IV. Areas of Research to be Supported**

The areas of research to be supported were developed through broad consultation, including PBS Regional Program Officers<sup>2</sup>, as well as researchers in developing country national agricultural research programs, researchers in the international agricultural research centers, and other international organizations involved in the development of biosafety systems in developing countries. These consultations highlighted the need to generate data relevant to crops that were soon to be commercialized, or which had already been commercialized. Therefore, proposals responding to the areas of research listed below should be developed with this need in mind.

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<sup>2</sup> The names of the Regional Program Officers are listed at the end of this call for proposals. Potential applicants are encouraged to consult with them as they prepare their proposals.



Proposals are sought for conducting research to assess and manage the risks, and to assess the environmental benefits and/or costs, associated with the usage of agricultural biotechnology products in developing countries. In particular, proposals should describe research or activities in one or more of the following areas:

### **Crop Plants**

#### *Outcrossing and its consequences*

- The ability of crops to outcross with compatible relatives in centers of origin or diversity. Preferably, studies to measure rates of gene flow should be tied to other research addressing the consequences of gene flow.
- The potential for enhancing weediness of compatible relatives.
  - Research to assess the effect on fitness of specific genes or of an equivalent traditional trait. Research should distinguish short term from long-term effects on biodiversity, including the contribution of fitness traits to invasiveness/weediness, as well as consequences to endemic, threatened, or endangered species.
  - Generating baseline data for transgenic crops. Examples of such research include: factors limiting the size of natural populations of the same species or compatible wild relatives; geographic distribution of crops and compatible relatives

#### Non-target and other unintended effects

- Studies to obtain non-target and other unintended effect data needed for crops nearing commercial application.
- Research to assess ecological benefits gained from the deployment of transgenic crops.
- Research to assess the potential weediness of genetically engineered crop plants and the potential impact of weediness on wild biodiversity in a given ecosystem.
- Research to assess the potential for pests to overcome pest resistance traits.
- Research that assesses the potential for shifts in pest populations.
- Research to assess changes in agricultural practices, such as pesticide use and tillage practices.

#### *Risk Assessment and Management*

- Research to develop experimental approaches to risk assessment applicable in developing countries. In particular, studies to demonstrate the validity and use of specific indicator organisms as representatives of different communities (soil microorganisms, parasites of target insects, etc.). Research to develop approaches that are low cost and have low requirements for specialized instrumentation, but which would be of high biological significance, are especially desirable.



- Research to develop strategies for management of pest-resistance traits. This work can include the development of models that take into account the cropping systems in developing countries, and effectiveness of alternative resistance management strategies in those systems.
- Efficacy and feasibility of genetic measures to restrict gene flow between crop plants and compatible wild relatives.

#### *Post-commercialization monitoring*

- Studies to determine post-commercialization impacts, such as consequences of gene flow, non-target effects or efficacy of resistance management strategies.

#### *Access to existing information*

- Organizing scientific meetings to bring together experts and researchers on specific transgenic crops and/or technologies as well as appropriate experts on affected biodiversity species/ecosystems. These meetings are designed to:
  - Compile and share existing baseline data on crops in development
  - Develop consensus positions regarding issues of concern, and experimental approaches to addressing those concerns.

It is anticipated that a maximum of one such meeting will be funded per round of applications.

### **Animals**

#### *Outcrossing and its consequences*

- Research to assess the fate of transgenes in the environment when introduced into natural populations, particularly those that affect fitness, viability of native populations, and genetic integrity.

#### *Ecological impacts*

- Research to assess the ecological impacts (e.g., competition, predation, habitat alteration) of transgenic animals upon key species in the receiving ecosystem.

#### *Risk management*

- Research to assess the efficacy of biological reproductive confinement systems.

### **Animal vaccines**

- Research to assess the safety of recombinant vaccines in advanced stages of development.

## **V. Criteria for Application**



## A. Who May Apply

Proposals must address biotechnology products and their impact on biodiversity in Africa or Asia, except for countries in which USAID is prohibited from working. Applicants may be from agricultural or environmental research institutions, developing country regulatory bodies, or universities. Also eligible are International Agricultural Research Centers (IARCs), international environmental conservation groups, non-governmental organizations, or private seed or biotechnology companies having an official presence in the countries or regions specified above. In addition, collaborations between agriculture and environment communities are strongly encouraged.

## B. Requirements for Application

Applicants must use the following guidelines for preparing grant applications:

- Proposed research must address the effects on *in situ* biodiversity of genetically engineered (transgenic) crops. Research that provides information that can be used to evaluate the relative effects of transgenic and traditional crop varieties on biodiversity are especially encouraged. Therefore, use of nontransgenic crops with traits equivalent to those introduced by transgenes is acceptable if they will provide data relevant to transgenic crops.
- Proposed research must involve genetically engineered plant or animal species that have agricultural applications.
- Proposed research must target Africa or Asia, with some research specifically taking place in these regions.
- Proposed research must contribute to regulatory decision-making. Statements of support from relevant national regulatory bodies for a proposed research project are highly desirable.
- Adequate documentation of proposed budget will significantly strengthen the application.

## VI. Proposal Format

The proposal should be no longer than 10 pages, single-spaced, including the title page, but excluding the budget and CVs (sections K and L). It should be in the following format.

- A. Title Page containing the following:
  - a. Title
  - b. Submitting institution
  - c. Investigators: Name, title, address, contact information (including email and fax), signatures of lead investigator(s)
  - d. Institutional Administrative Officials (if different from investigator): Name, title, full mailing address, signatures
  - e. Budget: Total requested funding



- f. Duration: Number of years of project funding
- g. Collaborating countries: All countries involved in the project
- B. Technical Summary/Abstract (should be one paragraph in length)
- C. Aim and Specific Objectives
- D. Background (including the need for the proposed research) and Rationale. This should also include a discussion of the relevance to wild biodiversity such as issues of centers of origin, biodiversity hot spots under threat, etc.
- E. Experimental Design
- F. Expected outcomes and research impact
- G. Time Line
- H. Role of each institution in collaboration
- I. Facilities and Resources
- J. References
- K. Proposed budget. Awardees will be required to contribute 25% in matching funds from non-US federal government sources. The budget should include the following items, broken down on an annual basis for the life of the project (budget template available on request from the BBI manager).
  - 1. Salaries and wages
  - 2. Fringe benefits
  - 3. Travel and transportation
  - 4. Equipment
  - 5. Supplies and Services (includes publications)
  - 6. Contractual
  - 7. Other
  - 8. Indirect Charges
  - 9. Sources and amounts of matching funds
- L. Curriculum Vitae of principal researcher/s

## **VII. Submission of Proposals**

### **A. When and Where to Submit**

An original and six copies of a proposal must be submitted. Proposals should be typed, single spaced, on one side of the page only. The text of the proposal should be prepared using type no smaller than 12 point font size and one-inch margins. All copies should be sent to the following address:

Grants Program on Biotechnology and Biodiversity Interface  
Program for Biosafety Systems  
Attn. Dr. H. Quemada  
Department of Biological Sciences  
Western Michigan University  
Kalamazoo, MI 49008-1903.

*Proposals submitted via facsimile (fax) or e-mail will not be accepted.*



**PROPOSALS MUST BE RECEIVED BY THE BBI MANAGER BY 5:00 P.M.,  
U.S. EASTERN TIME APRIL 15, 2004.**

## **B. Acknowledgment of Proposal Receipt**

The receipt of all proposals will be acknowledged via the Internet (e-mail) or fax. Therefore, it is important to include the e-mail address and/or fax number of the principal contact on the title page. This acknowledgement will contain a proposal identification number. Once your proposal has been assigned a proposal number, please cite that number in future correspondence.

## **VIII. Proposal Evaluation**

### **A. Evaluation Criteria**

Proposals will be evaluated and ranked according to the following criteria:

- 1) SCIENTIFIC QUALITY (30 POINTS)
  - Clear presentation of hypotheses to be tested
  - Appropriate use of methods for testing hypotheses
  - Appropriate design of experiments, with special attention to using appropriate “checks” or controls.
  - Appropriate application of statistical methods for analyzing results
- 2) POTENTIAL APPLICATION OF PROPOSED RESEARCH TO THE REGULATORY PROCESS (25 POINTS)
  - Degree to which proposed research specifically addresses priority regulatory questions
  - Degree to which proposed research will be useful to policy-makers in the near term
  - Degree to which the technologies studied are likely to be applied in the near term, and to crops that have regional significance
  - Degree to which research builds capacity in developing countries to undertake science-based risk assessment.
- 3) TECHNICAL FEASIBILITY (25 POINTS)
  - Experience level and demonstrable ability of researchers to carry out the proposed research
  - Available resources
  - Appropriate assessment of effort required to complete the research, including realistic timelines and budget
- 4) DEGREE OF COLLABORATION (20 POINTS)



- Collaboration between developing country research or regulatory institutions; or collaboration between international or developed country academic research institutions and developing country research or regulatory institutions.
- Collaboration between agriculture and environment communities.

### **B. Evaluation Committee**

Proposals will be evaluated by a committee that consists of experts in agricultural and environmental issues surrounding the use of traditional or transgenic organisms and/or ecosystem/biodiversity management. The committee will also consist of at least two representatives from USAID, and one member of the PBS project responsible for assistance in policy development.

### **C. Awards**

Selection of awards will be made by May 31, 2004, and will be announced immediately thereafter.

In accordance with a Federal Regulation 22 CFR 216, all grants will be required to submit to an environmental review. In addition, under the new USAID biosafety policy all grants which involve the field testing or use of genetically engineered products will be required to submit a biosafety proposal to USAID for external review and demonstrate host country biosafety approval for the specific experiment or use proposed. This external biosafety review will be incorporated into an environmental review.

## **IX. Programmatic Contact**

For additional information on the program, please contact:

Dr. Hector Quemada  
BBI Program Manager  
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Potential applicants are also encouraged to consult with the Regional Program Officers or the BBI Program Manager as they develop their proposals. The Regional Program Officers are

**East Africa**  
Dr. Theresa Sengooba



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Coordinator Biotechnology Research NARO.  
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