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A Biotechnology Course for Developing Countries

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Abstract

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Keywords

Agricultural Biotechnology, Biosafety, Capacity Building, Developing Countries, Education, Training, Transgenic Crops

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A Biotechnology Short Course for Developing Countries

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Abstract

Biotechnology offers benefits, but few developing countries have approved genetically engineered (GE) crops. Extension educational programs could help prepare stakeholders in developing countries to influence biotechnology policies. Michigan State University (MSU) developed a two-week course that was taught 14 times from 2002 to 2010 for 251 participants from 58 developing countries. This course helped form an international network of biotechnology specialists who collaborate with stakeholders.

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Introduction

Agricultural biotechnology can reduce hunger, enhance farm profitability and protect the environment, but only fifteen developing countries have approved genetically engineered (GE) crops (James, 2010). Davis, Irani and Payson (2004) identified a need to train international stakeholders to participate in agricultural biotechnology policy development. Navarro (2006) claimed that extension educators could help lead a new Green Revolution with biotechnology. Others cited a need to build biotechnology capacity, including human resources, infrastructure, facilities, policies and partnerships (Grebmer & Omamo, 2005; Johnston, Monagle, Green & Mackenzie 2008).

Continuing a Michigan State University (MSU) legacy of international education and outreach, we developed an international short course in agricultural biotechnology for participants from developing countries. The intent was for this course to become part of a basket of international training programs that MSU offers to build human resources and institutional capacity in agriculture (Weir & Maredia, 2006).

Development and Implementation

We sought collaboration and financial support from the United States Department of Agriculture Foreign Agriculture Service (USDA-FAS). The agency provided funding for the development and initiation of this course at MSU in 2002. Since then, USDA-FAS has helped identify and recruit participants from developing countries, and it sponsors many of them through the Cochran Fellowship Program.

To develop course curriculum we obtained input from experts in universities, government agencies, non-profit organizations, biotechnology companies, and USDA-FAS. Based on needs identified in developing countries we decided to go

beyond the science of biotechnology to also cover policies, regulations, commercialization, and communication. We offered the first course in September 2002, and since then have taught it thirteen more times. For the fourteen courses, 251 participants from 58 developing countries in Africa, Asia, Eastern Europe, Latin America, and the Middle East have attended. Government employees made up 46% of the participants, and 39% were scientists. Other participants included lawyers, journalists, business managers and NGO representatives.

Course Components

The first week of the course is held at Michigan State University. Scientists share information on their research projects in plant and animal biotechnology so that participants become familiar with biotechnology applications in agriculture. Participants also meet farmers who grow GE crops and, together with extension specialists, discuss their experiences with GE crop production and marketing. The first-week curriculum also covers societal acceptance of technology, communication, intellectual property rights (IPR), technology transfer and an open forum with faculty members involved in biotechnology research.

During the second week, participants travel to observe biotechnology firms that develop and commercialize agricultural products worldwide. Visits to the Donald Danforth Plant Science Center and Monsanto have been included in some courses. Then the course moves to Washington, D.C for a concluding session. Representatives from the federal government, international organizations and the media discuss their programs related to biotechnology regulation, communication and outreach.

The short course provides a platform for stakeholders in the U.S. to create new linkages with participants involved in

agricultural biotechnology around the world. Graduates receive copies of the presentations on a CD, which also contains web links of biotechnology resources and a list of faculty and participants for future networking.

Evaluation

In 2009 we surveyed participants in the previous twelve courses. Ninety-two percent of the respondents strongly agreed with the following statement: “The MSU course provided me with sufficient information and training to raise my understanding on biotechnology issues.” All of the respondents agreed or strongly agreed that the course provided them with tools to influence policy in their countries. None disagreed with the statement that the course provided tools to build stakeholder coalitions.

We asked participants, in an open-ended question, about key strengths of the course. They identified opportunities to see GE crops in the field and to interact with various stakeholders, especially farmers, as hallmarks of the course. The farm visits included a lunch in which participants were served GE sweet corn. Participants also valued other communications-related components, including networking with participants from other countries and practical exercises in GE acceptance.

Participants suggested several enhancements, including sessions related to co-existence of GE crops with organic agriculture, new GE products in development, and international trade regulations. Some suggested a session to reveal perspectives of stakeholders who oppose biotechnology. Many participants expressed strong interest in forming partnerships for collaborative research and for offering similar courses in their home countries.

Impacts

Short course graduates contribute to biotechnology programs in their home countries. One participant from Albania published articles in agricultural magazines and is involved in the Ministry of Agriculture’s discussions about biotechnology. A participant from Peru is serving on the Advisory Board of PeruBiotec, a new NGO that brings stakeholders together for discussions on biotechnology. Another graduate is working with Malaysian Biotechnology Information Center (MABIC) in building coalitions among biotechnology stakeholders. One Sri Lankan is actively involved in the formulation of the National Biotechnology Research and Development Program.

Many other participants use course materials and resources that were provided for their teaching needs. These spillover effects have been significant and will continue in the future. The success of this course has made it an integral part of the international agricultural development programs at MSU. Faculty have conducted Training of Trainers programs for offering similar courses in developing countries for academic and non-academic audiences. This is achieved through collaboration with local universities and non-profit organizations with interest in training and capacity building. Many universities around the world are using materials from this course in their educational programs.

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