

## **Biotechnology and Agriscience Research Course and Curriculum Development**

### ***Poster Abstract***

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### **Introduction**

Today's biotechnology is being used to develop agricultural products and to improve existing plant and animal species. Agricultural scientists, technicians and consumers need to understand agricultural biotechnology in order to conduct research and to make informed decisions. High school agricultural education programs can provide young people the information and training they need to pursue related careers or to become informed decision-makers.

### **Program Phases**

In 1994, North Carolina agriculture education teachers indicated in a North Carolina Department of Public Instruction (NCDPI) survey that agricultural biotechnology should be taught in North Carolina high school agricultural education programs. In 1996, a committee of industry, business and education personnel was formed, under the leadership of North Carolina State University, to determine the competencies and curriculum that should be taught in a course titled Biotechnology and Agriscience Research. This committee referred to the "National Voluntary Occupational Skill Standards for Agricultural Biotechnology Technicians" to determine the skills needed for an entry-level employee in agricultural biotechnology.

During the 1998-1999 and the 1999-2000 school year, the Biotechnology and Agriscience Research course was piloted in eleven schools across North Carolina. A grant was received from the North Carolina Biotechnology Center to buy supplies for the pilot labs and teachers were also invited to participate in their equipment loan program.

The pilots and project director accomplished the following objectives:

1. Taught basic biotechnology and current agricultural applications of biotechnology in North Carolina high schools.
2. Introduced approximately 50 teachers to the labs/curriculum in the summer of 1999.
3. Piloted the curriculum materials and lessons and provided pilot teacher training at NCSU.
4. Collected data to assess student performance.

To achieve the objectives:

- Trained pilot teachers in workshops at NCSU.
- Trained pilot teachers in workshops at Carolina Biological Supply Co., Inc.
- Provided teachers with access to equipment and lab supplies to implement biotechnology

lessons.

- Worked with the DPI and pilot sites to complete the course blueprint.
- Worked with consultants to develop matching curriculum materials.

During the course development process in North Carolina, the pilot teachers and the curriculum committee realized the need for a comprehensive and up to date agricultural biotechnology curriculum. The National Agricultural Council was interested in supporting the development of such a curriculum. Smith and Strozier consulting firm was identified as having developed biotechnology curriculum and having assisted with various high school agricultural projects in North Carolina. Current agricultural applications of biotechnology were integrated with employee skills identified in the “National Voluntary Occupational Skill Standards for Agricultural Biotechnology Technicians” and the course competencies of the North Carolina Biotechnology and Agriscience Research course to create the framework for the “Biotechnology for Plants, Animals, and the Environment” curriculum. This curriculum was piloted in North Carolina and nationwide by the National Agricultural Education Council in 1999.

An intensive four day curriculum training workshop was sponsored by the North Carolina Biotechnology Center and conducted by North Carolina State University for agricultural and biology teachers in North Carolina in July 2000.

### **Results To Date**

The goal of this project was to expand biotechnology education among Agricultural Education students in North Carolina. During the 1998-1999 school year, 98 students were enrolled in the Biotechnology and Agriscience Research course at pilot schools. An additional 295 students took part in one or more of the biotechnology labs integrated into an existing agriculture education course. In the summer of 1999, pilot teachers conducted a teacher workshop at the annual N.C. Agricultural Education Summer Conference to introduce over 50 teachers to the course and new curriculum. In the fall of 1999, the pilot teachers and project director presented an introductory NATA workshop to showcase the curriculum to over 100 teachers nationwide. In March 2000, the National Agricultural Education Council conducted a national train the trainer workshop. The curriculum is now being sold and distributed by the National Council. The project director has completed the development of 500 multiple choice questions to be used for end of course student assessment in North Carolina.

### **Implications**

In this project, many partners of education have come together to deliver biotechnology education to agriculture education students. The purpose of agriculture education is to educate and train future leaders and employees of the agriculture industry. The success of these students will depend on their knowledge of current technology including biotechnology. In turn, the biotechnology industry will depend on the agriculture industry to understand and utilize biotechnology products and processes. Biotechnology education should and is an integral part of agriculture education.

### **Future Plans**

The project director is in the process of conducting research to identify variables related to the adoption of the course and curriculum in North Carolina. By identifying these variables, North Carolina will be able to develop and conduct more effective activities that will encourage the adoption of the course and curriculum.