

# Plant Breeding Education Curriculum Development: Delphi Study

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Use of a **Delphi Study** offers a proven mechanism for bringing together a group of experts (breeders) and other stakeholders to provide a comprehensive list of important *educational*, *competency*, and *experiential* components for graduate level training in plant breeding. All results from this study will be made publically available for use internationally.

## Introduction

The need to strengthen public plant breeding programs and prepare more professional plant breeders is essential (Guner, 2003), and this demand has been emphasized by groups including the Plant Breeding Coordinating Committee (PBCC), the Global Initiative for Plant Breeding Capacity Building (GIPB), and at meetings such as the American Seed Research Summit. Universities and training centers are beginning to address these concerns through public-private initiatives that support breeder education. A logical next step is to verify what knowledge, skills and experiences will be required to meet future needs of employers.

It is important for centers of education to critically evaluate programs, update courses and design modern plant breeding curricula to attract the best and brightest students (Bliss, 2006). This may entail integrating new content about topics that are revolutionizing modern biology while also retaining the core of plant breeding principles. Practical experience and critical skills are needed to ensure the breadth and depth of education meet future needs of professional breeders. In direct support of this, the Delphi study on plant breeding educational components is being funded through private companies, university departments and individual contributions.

## Stakeholder Groups

A diverse group with vested interest in improving plant breeding education and training (over 240 people).

1. Breeders, biologists and administrators at universities, governmental agencies and institutes and other stakeholders in developed countries;
2. Breeders and employers at private seed companies and other agri-businesses in developed countries;
3. Public and private breeders, educators and other stakeholders in developing countries;
4. Recent graduates of graduate programs with an emphasis on plant breeding.

## Study Direction

Dr. Cary Trexler, Associate Professor  
UC Davis School of Education

In 2004, Dr. Trexler led a Delphi study on curriculum for a new Sustainable Agriculture major at UC Davis (Parr, 2007).



## Benefits of this study

1. Provide consensus-based information to update and improve plant breeding courses and curricula, nationally and internationally.
2. Help plant breeding graduates prepare for future challenges and opportunities in a rapidly changing global market place.
3. Refine and strengthen programs to ensure a continuing supply of well-prepared plant breeders to meet demand in the public and private sectors of industrialized and emerging countries.
4. Develop new integrated and interactive programs with industry and among institutions nationally and internationally.

## What is a Delphi Study?

1. Iterative data-gathering strategy to aid in the survey of expert judgments;
2. Method of anonymous surveying without undue emphasis on individual opinions;
3. Highly effective way to elicit, collate and focus expert judgment toward a consensus.

## Study Goals

1. Engage knowledgeable stakeholders to identify important components of future plant breeding graduate education and training.
2. Through a comprehensive, consensus-based approach, summarize opinions and suggestions for programs, curriculum content, and practical experience that will prepare future plant breeders.

## References

- Bliss, F. *Plant breeding in the US private sector*. 2006: Amer Soc Horticultural Science.
- Guner, N. and T.C. Wehner, *Survey of US land-grant universities for training of plant breeding students*. Crop Science, 2003. **43**(6): p. 1938-1944.
- Parr, D.M., et al., *Designing sustainable agriculture education: Academics' suggestions for an undergraduate curriculum at a land grant university*. Agriculture and Human Values, 2007. **24**(4): p. 523-533.

**For more information about this study, please contact:**

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## **Plant Breeding Education Curriculum: A Delphi Study**

### **Led by the Seed Biotechnology Center at the University of California, Davis**

*Q. Why is a Delphi study or any study needed now?*

**A.** Many groups have recognized there is a shortage of well-prepared professional plant breeders to meet current and future needs world wide. As university programs are beginning to gear-up to meet these needs, questions have arisen regarding what students should receive in modern preparation for their careers.

*Q. Why a Delphi study and what is it?*

**A.** The Delphi study is a data gathering tool to aid in the survey of expert opinions. It is a proven mechanism for bringing together a diverse group of experts without undue emphasis on individual opinions. It is a highly effective way to elicit, collate and focus expert judgment toward a consensus.

*Q. Where will the Delphi study be done?*

**A.** It is being led by the Seed Biotechnology Center at UC Davis. The study will be directed by Dr. Cary Trexler, Associate Professor, School of Education in collaboration with Dr. Fred Bliss, Professor Emeritus and Seminis Vegetable Seeds, Mike Campbell and other members of the SBC.

*Q. Who will have access to the information gathered through the Delphi study?*

**A.** The information will be available and widely disseminated through various media to all who want it.

*Q. Will this result in most graduate programs being alike?*

**A.** This is unlikely and not anticipated. The information will provide a consensus of the type of education and experience training needed by the next generation of professional plant breeders. Each program will continue offering a unique mix of courses, experience and practical skills that fit their educational mission.

*Q. Is the intended information relevant and useful only to U.S. universities and students?*

**A.** No, most institutions world wide have similar questions about content, skills and experiences that should be offered to students. Also, this information will be useful for non-degree granting institutions that provide practical experience (e.g., the International Centers and other institutes) and seed companies offering internships.

*Q. How is the study being financed?*

**A.** Funding to support this study is being requested from private companies, university departments, and personal contributions.

*Q. What information will be collected by the Delphi study?*

**A.** The primary information of interest is what type of educational content, knowledge, skills and expertise should be provided for students seeking advanced degrees in plant breeding.

*Q. Who are the experts and stakeholders being contacted for their expert opinions about educating the next generation of breeders?*

**A.** Four groups of breeders and other experts are being assembled from: 1) the public sector in industrialized countries with strong private plant breeding; 2) the private sector in industrialized countries with a strong private sector; 3) the public and private sectors of developing countries with limited private sector plant breeding, and 4) recent graduates of plant breeding programs from any country now working in plant breeding or related professions.