

Careers in Crop Improvement



RITA MUMM, PHD
DIRECTOR, ILLINOIS PLANT BREEDING CENTER
ASSOCIATE PROFESSOR OF QUANTITATIVE
GENETICS AND PLANT BREEDING
DEPARTMENT OF CROP SCIENCE
UNIVERSITY OF ILLINOIS AT URBANA- CHAMPAIGN

APRIL 7, 2010



The Grand Challenge



- World population estimated at >9B by 2050
- Increased meat consumption in emerging economies as the standard of living increases
- No appreciable change in available crop land
- Falling water tables globally
- Climate change will increase risk



Crop yields must increase 2- to 3-fold by 2050 to meet the projected demand for food, feed, fiber, and fuel

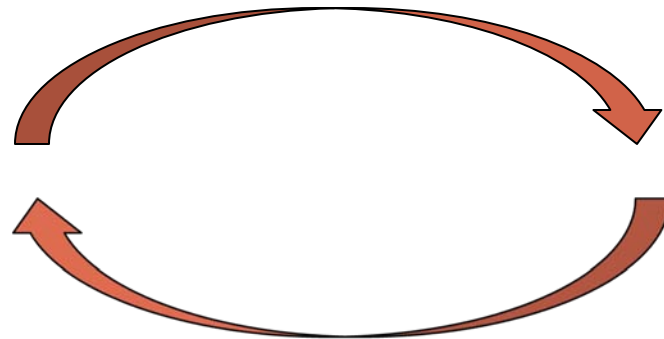


Crop improvement involves the cycle of creating and exploiting genetic variation



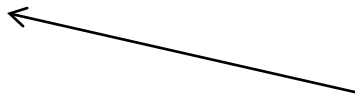
Create useful genetic variation

Exploit genetic variation to achieve genetic gain toward targeted goals



Biotechnology

Define genetic specificity underlying phenotypic expression



Multiple disciplines come into play



Conventional Breeding

Genetics: Quantitative, Population
Plant breeding methods
Selection theory
Statistics & experimental design
Knowledge of germplasm
Phenotypic evaluation

Agronomy/Botany

Plant Physiology
Plant Biology
Soil Science
Pathology
Entomology

Engineering

Profiling equipment
Analytics e.g. grain
composition
Robotics
Nanotechnology

Data Management, Analysis, Display

Bioinformatics
Information Technology
Information Management
Computer programming
Simulation & Modeling
Statistical and mathematical
theory

Molecular Biology

Biochemistry
Molecular genetics
Genomics
Transformation & tissue culture
Sequencing
Molecular marker technologies
Gene cloning



The Illinois Plant Breeding Center



- 29 faculty with specializations across crops and across disciplines
- Focus on educating the next generation of scientists in crop improvement, which of course includes conducting contemporary research that fosters education goals in terms of relevance, quality, impact at the Illinois/US/global levels, and multi-disciplinary team orientation
- Graduate student enrollment has nearly doubled since 2008!
- 21 fellowships supported by industry and private donors
- Learn more at <http://plantbreeding.illinois.edu>



Whether in an industrial or an academic setting, consider a career in plant breeding!

- High demand
- High tech
- Highly innovative
- High impact
- High compensation
- Inclusive
- Global opportunities
- GREAT JOB!

