

Crop Breeding - GMOs: Technology and Regulation

Key Terms and Concepts:

Upon completion of this course, the student should be familiar with the following terms, concepts, and programs.

Genetic Engineering

Transgenic plants

Ice minus

Gene Revolution

Novel traits

Multiple transgenes

Gene stacking

Gene flow

Non-target effects

Indigenous and non-indigenous plants

rBST

Herbicide tolerant crops

Bacillus thuringiensis (Bt)

“Farm to Fork” traceability

Transgenic fish

Aquaculture

Gross food conversion

Net fitness

Extinction through hybridization

Invasive species

Regulatory framework for Biotechnology

Asilomar Guidelines

Coordinated Framework

Substantial Equivalence

Risk analysis of transgenic plants
Case-by-case approach to risk analysis
Pre and post test environmental monitoring of transgenic plants
Federal Food Drug and Cosmetic Act (FFDCA)
Generally Recognized as Safe (GRAS)
Food and Drug Administration (FDA)
Animal and Plant Health Inspection Service (APHIS)
Biotech food labeling
Labeling deception

Links:

Information on Biotechnology – US:

National Center for Biotechnology Information
<http://www.ncbi.nlm.nih.gov/>

The President's Council on Bioethics
<http://www.bioethics.gov/>

Agricultural Biotechnology, USDA
http://www.usda.gov/wps/portal/!ut/p/ s.7_0_A/7_0_1OB?navid=BIOTECH&parentnav=AGRICULTURE&navtype=RT

Current Research Information System (CRIS), USDA
<http://cris.csrees.usda.gov/>

ERS Briefing Room on Biotechnology
<http://www.ers.usda.gov/Briefing/biotechnology/>

Agriculture at the National Academies, National Academy of Science
<http://www.nationalacademies.org/subjectindex/agr.html>

National Biological Information Infrastructure (NBII)
<http://www.nbii.gov/>

Information System for Biotechnology - Field Test Releases in the US

<http://www.nbiap.vt.edu/cfdocs/fieldtests1.cfm>

Agriculture Network Information Center, Ohio State University

<http://www.agnic.org/>

Seed Biotechnology Center, UC Davis

<http://sbc.ucdavis.edu/>

Office of Biotechnology, Iowa State University

<http://www.biotech.iastate.edu/>

Ag Biotech Infonet

<http://www.biotech-info.net/>

Special Issue on GM Organisms, New Scientist

<http://www.newscientist.com/channel/life/gm-food>

Library of Crop Technology, University of Nebraska

<http://croptechnology.unl.edu/listLessons.cgi>

Information on Biotechnology- International:

Electronic Forum on Biotechnology in Food and Agriculture, FAO

<http://www.fao.org/biotech/index.asp?lang=en>

International Center for Genetic Engineering and Biotechnology

<http://www.icgeb.org/index.htm>

Science and Technology for Development, the United Nations

<http://stdev.unctad.org/themes/biotech/docs.html>

Working Group on Genetically Modified Organisms, the United Nations

<http://www.unece.org/env/pp/gmo.htm>

CGIAR and Agricultural Biotechnology

<http://www.cgiar.org/impact/agribiotech.html>

Biotechnology, International Livestock Research Institute

<http://www.ilri.cgiar.org/pageselflink.asp?pageid=31&menuid=27>

GT –Biotechnology, ICRISAT

<http://www.icrisat.org/gt-bt/gt-bt.htm>

International Field Test Sources

<http://www.isb.vt.edu/cfdocs/globalfieldtests.cfm>

Issues in Biotech

<http://www.actionbioscience.org/biotech/index.html>

A comprehensive listing of biotechnology related websites from around the world at Checkbiotech,

<http://www.checkbiotech.org/root/index.cfm?fuseaction=links>

The Golden Rice Project

<http://www.goldenrice.org/>

Biotechnology Risk Assessment and Regulation – US:

Biotechnology Regulatory Services, APHIS, USDA

<http://www.aphis.usda.gov/brs/index.html>

Biotechnology Risk Assessment Research, USDA

http://www.csrees.usda.gov/nea/biotech/in_focus/biotechnology_if_risk.html

Office of Science and Technology Policy

<http://www.ostp.gov/>

Environmental Protection Agency (EPA)

<http://www.epa.gov/>

Food and Drug Administration

<http://www.fda.gov/>

Biotechnology Risk Assessment and Regulation – International:

Risk Assessment, Biotechnology and Food Safety, FAO

http://www.fao.org/ag/agn/food/risk_biotech_en.stm

Convention on Biological Diversity

<http://www.biodiv.org/default.shtml>

Food Safety – Biotechnology (GM Foods) WHO

<http://www.who.int/foodsafety/biotech/en/>