



National Workshop on the Future of Education in Plant Pathology & Related Disciplines

The Future Educational Needs of Industry Employers

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Johnston, IA

Agricultural Industry

Many Diverse Interests



Difficult task to speak on behalf of all in “Industry”

Where will you find “Industry” plant pathologists?

- Agricultural consulting companies
- Agrichemical companies
- **Seed and plant production companies**
- Tissue culture laboratories
- Diagnostic laboratories
- Botanical gardens and arboreta
- Biotechnology firms
- Biological control companies
- Private practice
- Nurseries and garden centers
- Lawn and landscape maintenance firms
- Environmental, agricultural, and patent law firms

Views expressed here are mine alone. They are taken from my 28 years with Pioneer Hi-Bred & valuable input from my Industry colleagues.



What changes should be made to meet Industry's needs?

Many of my comments are consistent with some of the recommendations identified in a recent report by the National Research Council of the National Academy.

I will also cite some of their data. I encourage you to obtain & read this very insightful report.

Transforming Agricultural Education for a Changing World

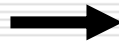
Committee on a Leadership Summit to Effect Change in Teaching and Learning

ISBN: 0-309-13222-3



First some background information,
Our world is changing fast!

□ Impact of technology



The same is true for technology commonly used in the Agricultural Sciences. There are many examples!

□ The demographics of people going into the Agricultural Sciences has changed too.

- No longer dominated by students coming from rural areas. Majority are now from urban areas. Limited agricultural experience.
-

Universities & Their Agricultural Science Programs Are Changing Too.

- Baccalaureate degrees in Agricultural & Natural Resources have increased over the past few years.
- From 1987 – 2004:
 - Baccalaureate degrees in Agriculture & Natural Sciences increased by **60%** vs. all baccalaureate degrees (all fields) that increased by 40%
 - Higher rates of gain were seen in **mid to late 1990's**.
 - **Agricultural degrees have declined over the past few years** while overall baccalaureate degrees continues to increase.
- Traditional “Colleges of Agriculture” are disappearing
 - Many are now College of Agriculture & _____
 - Natural Resources, Life Sciences, Environ. Sciences, etc.
- New fields of study are developing: agricultural biotechnology, food science/safety, turf management, etc

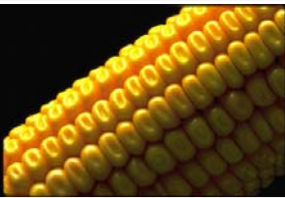
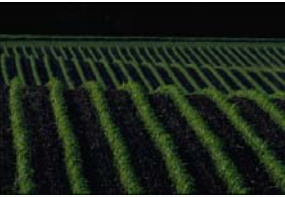
A silhouette of a person sitting in a field, reading a book. The background is a vibrant sunset with orange and red hues. The person is positioned on the right side of the frame, facing left. The field in the foreground is dark, with some plants visible.

Traditional majors are projected to decline

- Soil & Crop Sciences
- Animal Sciences (meat animals)
- Entomology
- Plant Pathology

**This may have some important implications
to the **Agricultural Industry****

Source: National Academy of Sciences. 2009. Transforming
Agricultural Education for a Changing World. ISBN: 978-0-0309-13221-3



Presentation Outline

I will focus my presentation into 3 components. These are skills that universities should place more emphasis in the teaching programs:

- Management Skills
 - Interpersonal Skills
 - Technical Skills
-



If you don't stop unacceptable behavior now,
it's just going to get worse!

How to Deal With Unacceptable Employee Behavior

A One-Day Seminar for Managers and Supervisors

**Do you have employees who are
so difficult to deal with that you're
ready to pull your hair out?**

Many
Companies
Utilize
Workshops
Like This
For Developing
& Improving
Their New
Managers

Do these problems sound familiar?

- Persistent absenteeism and tardiness
- Poor communication skills
- Weak team skills
- Failure to follow instructions
- Unacceptable productivity
- Poor work quality

Recognize these difficult employees?

- Whiners
- Know-it-alls
- Lone rangers
- Bullies
- Troublemakers
- Excuse makers

**Source: Rockhurst University Continuing Education Center, Inc.
6901 W. 63rd Street
Overland Park, KS 66202**

Management Skills



• Business 101

- We're scientists thrown into the business world – managing budgets, people, etc.
 - Not many of us were trained in business management. Develop “listening” skills!

Foster basic understandings of running a business/project:

Spreadsheets, developing budgets, managing cost, achieving profitability targets, legal issues, business ethics, managing risk, etc.



Management Skills

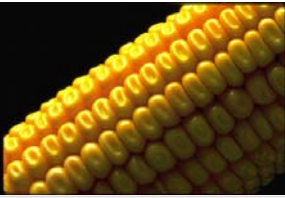
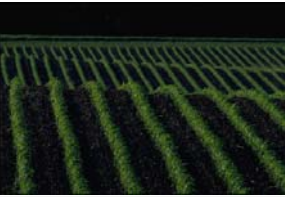
Project Management Skills

Teach them how to develop these skills

- Required reading (Covey's *7 Habits of Highly Effective People*; Kouzes & Posner's *The Leadership Challenge*; Lencioni's *The Five Dysfunctions of a Team*; Johnson's *Who Moved My Cheese?*, etc.)
- Goal setting, multi-tasking,
- **Handling change/flexibility**,
- Time management,
- **Team building**,
- Creating win/win situations,
- Risk management
- Multicultural awareness
- Presentation skills



**Emphasize
Critical
Thinking
Skills**

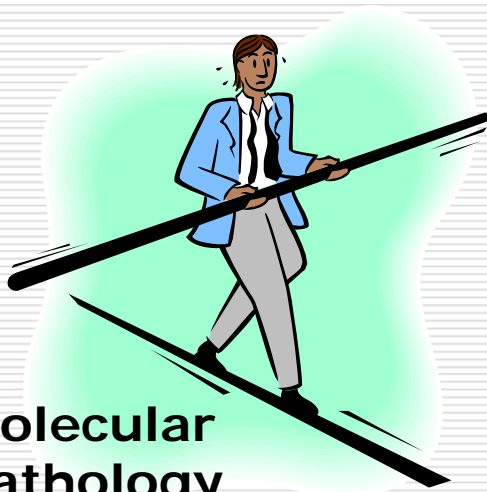


Interpersonal Skills

Foster the basics we all were suppose to learn:

- Robert Fulghum's simple principles:
All I Really Need To Know I Learned In Kindergarten
"Wisdom was not at the top of the graduate-school mountain, but there in the sand pile at Sunday School."
 - Dale Carnegie's Classic Principles:
How to Win Friends & Influence People
 - Richard Carlson's ideas on managing your life:
DON'T SWEAT THE SMALL STUFF
... and it's all small stuff
-

Technical Skills – Need to know both worlds



**Molecular
pathology**

How Do We Link
Them With
Modern Agriculture?



**There has been a
tremendous impact that
shows like CSI has had
in generating scientific
interest in students.**

Our students need to be part CSI investigators too!


MaizeGDB 
Maize Genetics and Genomics Database

Useful Pages

[jobs](#) | [upcoming events](#) | [sitemap](#)

| [docs](#) | [bulk data](#) | [browse data](#) | [tools](#) | [login / register](#) |

[links](#)

[home](#) |  Search

all data

for

Go!

Tools

This page serves as an index of useful tools you may wish to use in your research.

MaizeGDB BLAST Search: Execute a BLAST search against the ZmDB (Maize Gene Discovery Project) sequence data set.

Mapped Sequence Search: Enter a list of sequence accession numbers and find out if they're mapped and on what maps.

Image Browser: Browse through our images to get a visual idea of some of the things that are stored.

Bin Viewer: Browse the maize genome in a visual fashion!

Locus Lookup: Search for genomic coordinates based on a locus. If the coordinates are unknown, this tool will estimate a region where this locus may be located based on a genetic map. This tool will provide links to the Genome Browser.

These tools are integrated throughout the site making searches quick and convenient. For example, all of these tools are available on sequence records (e.g., see [AI438620](#)), allowing automatic searching with just a mouse click.

Playground Community Curation Tools: Try out the Community Curation Tools with username corn and password cob! Make up fun bogus records here to learn how to use the tools before beginning to curate real data with the Real Community Curation Tools.

Real Community Curation Tools: Create records and curate data stored in the database! To get information on how to become a curator, fill out and submit [this form](#) and check the box to become a curator.

[Return to the homepage](#)

Last updated 12:30 pm, Jan 29, 2009.

Powerful, *useful tools* readily available to us to better understand Genetics & Host/Pathogen interactions

Chromosome coordinates based on MaizeSequence.org marker positions for locus name: **rpp9**

The exact coordinates for this locus were not found. The coordinates will be estimated based on the nearest flanking loci with known coordinates.

The Locus **rpp9** is flanked by the following loci with known chromosome coordinates: ([rp1](#) and [umc1319](#))

The Locus **rpp9** is **estimated** to be between position **2,783,200** and position **3,454,500** on **Chromosome 10** based on the map: **IBM2 2008 Neighbors 10**

Use a different map

This region is **671,300** base pairs long.

(Click [here](#) to go to the Genome Browser or scroll to the bottom of the page)

Locus	Chr	Map Position	Chr Start	Chr End
rp1	10	53.04	2778300	2783200
rpp9	10	59.99		
umc1319	10	62.6	3454500	3459400

Loci known to be between the flanking loci at map positions **53.04** and **62.6** on the **IBM2 2008 Neighbors map**:

► [Click to expand details](#)

The Locus **rpp9** is **estimated** to be between position **2,783,200** and position **3,454,500** on **Chromosome 10**

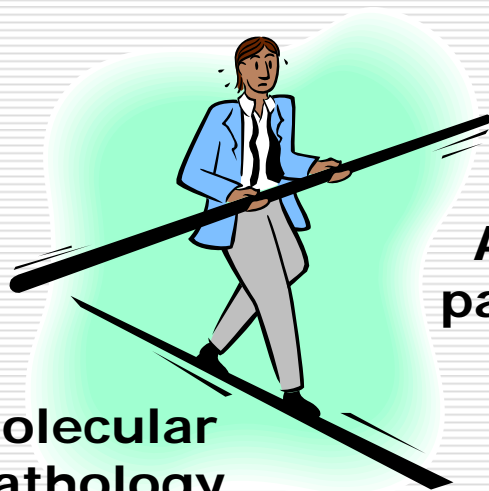
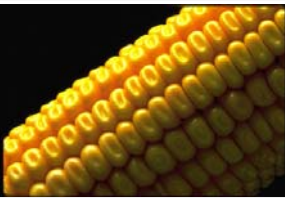
(Click on image to go to the Genome Browser)

MaizeGDB [Bin Viewer](#) - browse 10.01

Locus Overview
Chrom.

1 | 2 | 3 | 4 | 5
6 | 7 | 8 | 9 | 10

Technical Skills – Need to know both worlds



Molecular
pathology

Applied
pathology



You need
trained people
to evaluate your
discovery!



It's just one of
many required
traits in a plant.

Give opportunities to find the new Gregor Mendel's in students!

Help to Ignite that spark of curiosity!
Why is one good and one so bad?

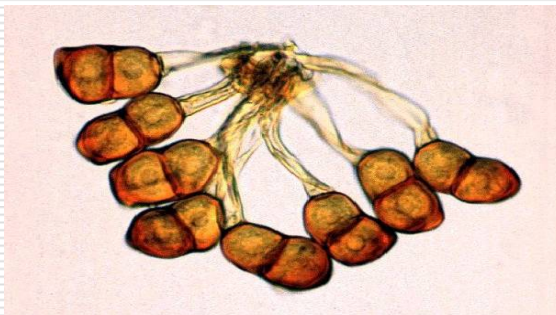
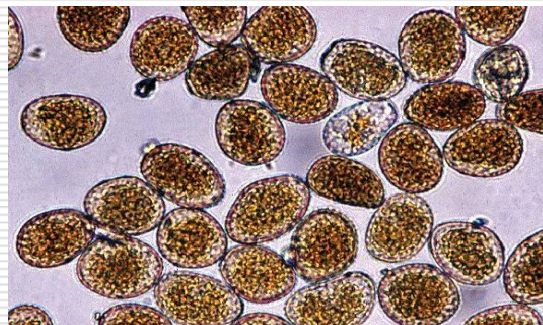
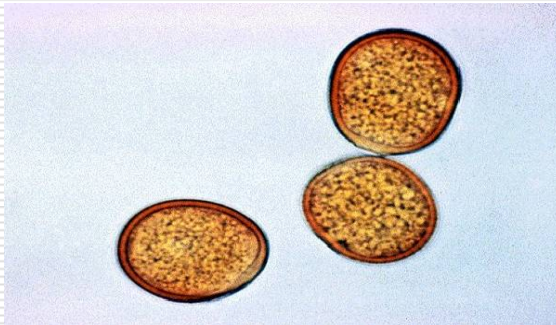
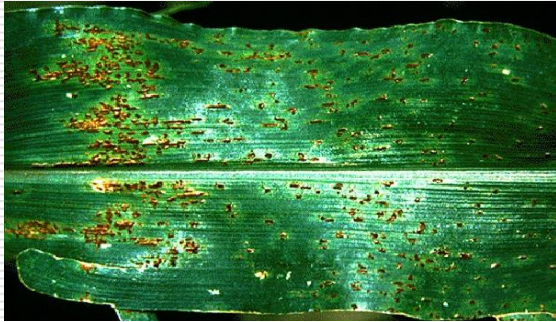


Students learn more when they are actively involved in real life situations/scenarios

Technical Skills – Offer Training Opportunities



Fundamentals – Mycology, entomology & other core essentials



We don't need expensive and time consuming testing procedures for all pathogens. Many times the pest will show us who they are if we know what & where to look.

Students need to have a good understanding of core competencies.
What are they?

Most of us would agree with past surveys of Industry needs: Skills & Abilities needed – College Graduates

- Interpersonal Communication Skills
- Critical Thinking Skills
- Writing Skills
- Computer Skills
- Cultural/Gender Awareness Sensitivity
- Quantitative Analysis Skills
- Knowledge of Business Management
- Oral Presentation Skills
- Knowledge of Accounting/Finance
- Intern/Co-op Work Experience
- Knowledge of Macroeconomics, International Trade
- Broad-based Knowledge in Liberal Arts
- International Experience
- Foreign Language Skills
- Production Agriculture Experience

In ranking of importance
(highest to lowest)

Source: AAEA Presentation: Response to Recommendation of the National Food & Agribusiness Management Commission July 2006 Franklin E. Boteler.

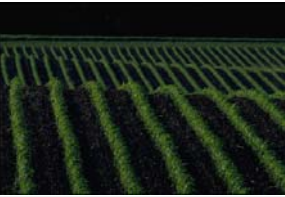


Making Changes

I support Recommendation#8 in the N.A.S. Report
Transforming Agricultural Education For A Changing World

“Stakeholders in academe and other sectors should develop partnerships that will facilitate enhanced communication and coordination with respect to the education of students in food and agriculture. The partnership should include the following elements:

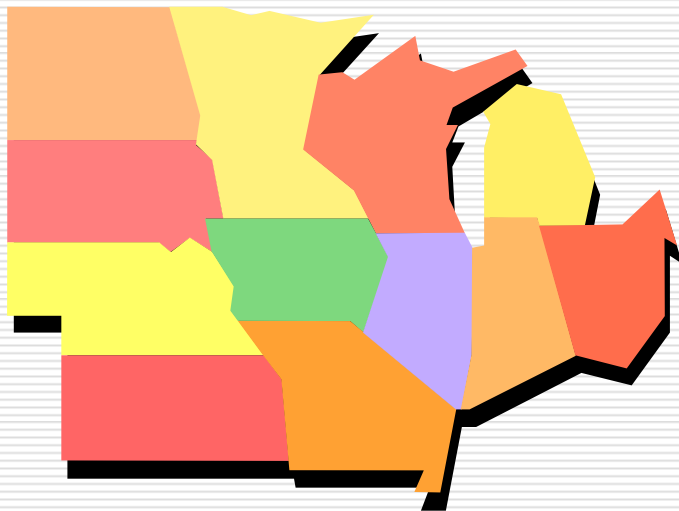
- Academic institutions should include representatives of industry and other employers on visiting committees, on advisory boards, and in strategic planning. Companies should include academic faculty on their advisory committees
-



Making Changes - continued

- Exchange programs should be developed that enable food and agriculture professionals to spend semesters teaching and working at academic institutions and enable faculty to spend sabbaticals working outside of academe.
 - *For Industry, taking a semester off may be difficult, but becoming involved in teaching a unit, etc. is more likely.*
 - Opportunities for students to work in non-academic settings should be developed and greatly expanded. Programs might include internships, cooperative education programs, summer opportunities, mentoring and career programs, job shadowing, and other experiences.
 - *Making a Co-op or internship as part of a undergraduate or graduate degree program?*
-

The Dawn of a new age in teaching agriculture? Coordinated Regional Training Opportunities



Universities within a region
and the Agri. Industries,
in partnership,
pool their resources to host
Mini-Workshops, diagnostic
clinics, IPM, or other programs
on a rotational basis.

These would give students an
opportunity to visit industry
and see possible career
opportunities they might
not have known existed
or really seriously considered.
It would give those in academe
greater interaction &
communication with industry.



Thank You!

