

Departmental Strategic Plans

Imperative 1: Elevate our faculty and their Teaching, Research and Scholarship.

1. Enhance the stature of our faculty.

A. Recruit quality faculty from diverse backgrounds to broaden the thought and educational environment.

Future:

Our goal is to identify and recruit faculty in emerging areas of relevance to plant pathology and plant microbiology. Opportunities for hiring new faculty will be extremely limited due to the number recently hired and budgetary limitations. A critical issue in the department is a lack of sufficient faculty diversity. Currently, the department is 83% male, 17% female with 8% Hispanic and 17% Asian faculty members. However, issues of faculty diversity can be remedied only by additional positions.

B. Promote international collaborations.

The department historically has focused on plant pathology issues specific to Texas and other southern states to support our constituents. Recently, several of our faculty have begun establishing collaborative interactions with colleagues at institutions in other countries. This new direction supports the recent university shift to focus on international experiences for faculty and students.

Examples of international collaborations include:

- **Dr. Dan Ebbole** developed a new BESC 484W course in 2010 that involves a four-week field experience in Taiwan. Three students have taken this new course, working with Dr. Wei-Chang Shen at the National Taiwan University. This university teaches a course (in English) on 'Biodiversity, Agriculture and Culture in Taiwan.' A future goal is the establishment of a "3+1" program between the National Taiwan University and Texas A&M University.
- **Dr. Won-Bo Shim** is working to establish an international consortium of scientists to study pathogenic *Fusarium* spp. These pathogenic fungi represent the most important agricultural plant pathogenic fungi due to the wide range of agricultural crops they attack and their ability to produce mycotoxins that pose critical health concerns for human and animal consumption. It is estimated that ~25% of crops world-wide are contaminated with mycotoxins. Dr. Shim has traveled to China and is interacting with the laboratory of Dr. Zonghua Ma at Zhejiang University in China. This collaboration would result in students from A&M traveling to China to work in laboratories at Zhejiang University. An aspect that makes this experience even more beneficial for A&M students is that China pays living, boarding and food expenses during the student visits.

- **Dr. Young-Ki Jo** hosts one Chinese internship student in his lab each fall, which supports the Michigan State University - China Turfgrass Management Program. The student has completed most course requirements for a 4-year turfgrass management degree (B.S.) in China. The internship experience in the U.S. is a requirement for completing the degree program. During the internship in his lab, the student is involved in multiple field and lab research projects focused on turfgrass pathology.
- **Dr. Young-Ki Jo** has established a research agreement with the Rural Development Administration (RDA) in South Korea (the Korean equivalent of the USDA). The research will be carried out for three years with rice pathologists in RDA. This project, titled “Development of control methods for seed borne diseases using plasma technology and silver nanoparticles in rice.” The goal of this project is to control important seed borne diseases on rice in Texas and South Korea. The particular objectives of this project are: 1) To develop the cold plasma technology for eradication seed borne pathogen in rice, and 2) To develop the silver nanoparticle compounds with antifungal property against pathogens concerned with seed borne diseases in rice. Each year, scientists associated with this project will be exchanged between Texas and South Korea.
- **Dr. Joshua Yuan, Dr. Won-Bo Shim and Dr. Dan Ebbole** traveled to China for a bioenergy conference held in Beijing in October, 2009. Dr. Yuan was an organizer and host for the first US-China Bioenergy Forum as part of the US-China Relationship Conference. In addition, he co-hosted the International Symposium of Biotechnology and Biofuels at Peking University. He also was a keynote speaker in a symposium for the dedication of Bioenergy Research Center in Jiangsu University and has accepted an Adjunct Professorship at Jiangsu University. The US-China Bioenergy Forum is one of the first high level bioenergy specific forum with leading scientists from both nations in attendance. A TAMU graduate student, Aaron Smith from Chemical Engineering, attended the conference and gave a talk.
- **Drs. Chuck Kenerley, Heather Wilkinson, Herman Scholthof and Jim Starr** hosted four Borlaug Fellows last fall. Our faculty have participated in these international programs for several years. **Drs. Dan Ebbole and Brian Shaw** hosted Borlaug Fellows from Cameroon in Fall 2007.
- **Dr. Jim Starr** travels extensively to West Africa to collaborate on research to develop nematode resistant crops. He has also hosted scientists from West Africa in his laboratory at Texas A&M.
- **Dr. Mike Kolomiets** is interacting with three scientists at CONACYT in Mexico, Dr. Martin Heil (Plant-Insect Mutualism), Dr. Doralida Guzmán (Mycotoxins), and Dr. Jean-Philippe Vielle (Functional Genomics and Apomixis). To date he has obtained seed from Dr. Vielle for 16 landraces of maize to sequence LOX4 and LOX5 to see if resistance to aflatoxin contamination and drought can be associated with any alterations in those two genes.

- **Dr. Brian Shaw** traveled to Mexico three times in the past three years to attend the Latin American Mycology Congress. He has long-standing collaborations with Dr. Rosa Mourino-Perez and Dr. Meritzel Riquelme at CICESE in Ensenada Mexico and serves on the advisory committee of Diego Delgado, a Ph.D. student of Dr. Mourino-Perez. Drs. Shaw and Riquelme are co-editors for an special issue of the journal *Fungal Biology*.
- **Dr. Libo Shan** is initiating collaboration with faculty of College of Life Science at Beijing Normal University. She gave a keynote talk in their annual Plant Calcium Signaling Symposium on December 2010. The efforts to recruit talented Ph.D. students with China Scholar Council (CSC) fellowships are undergoing.
- **Dr. Libo Shan** is collaborating with Dr. Zhaohu Li, the Dean of College of Agriculture and Biotechnology, Beijing Agricultural University on the study of cotton abiotic stress resistance. One joint publication has been accepted by *The Plant Journal*. Two Ph.D. students with CSC fellowships are being recruited into Dr. Shan's lab.
- **Dr. Libo Shan** is collaborating with Dr. Gonçalo Apolinário de Souza Filho from the Center of Bioscience and Biotechnology, North State University of Rio de Janeiro, Brazil. A Ph.D. student, Ms. Aline Chaves Intorne, will join Dr. Shan's lab for one year (January to December 2011 to study the early signaling events in plant innate immunity.
- **Dr. Herman Scholthof** collaborates with the John Innes Center in England.
- **Drs. Herman Scholthof and Karen-Beth Scholthof** will be giving a lecture series on Plant Virology in May at the L. N. Gumilyov Eurasian National University, in Astana, Kazakhstan.
- **Fujian Agriculture and Forestry University (FAFU), FaoHou, China.** Dr. Libo Shan has a graduate student from FAFU in her laboratory. Recently, Dr. LS Pierson led a visit to FAFU to give invited lectures and discuss A&M faculty minicourses and research collaborations. Accompanying him were Drs. EA Pierson, L. Shan and Ping He. The trip was organized by Dr. Zonghua Yuan, Professor of Plant Pathology & Molecular Genetics, Vice President of Fujian Agriculture and Forestry University. An MOU is under development.
 - Summer 2011, Drs. Daniel Ebbole and Won-Bo Shim taught a graduate level course in “fungal genetics/genomics and fungal-plant interactions” at Fujian Agricultural and Forestry University, Fuzhou, Peoples Republic of China. Dr. Zonghua Wang, Professor of Plant Pathology and Vice President of International Affairs, sponsored this two-week summer intensive course. In addition to teaching the course, Drs Ebbole and Shim interacted with graduate students and faculty at Fujian Agricultural and Forestry University to strengthen research collaborations.
 - Summer 2011, Drs. Michael Kolomiets and Won-Bo Shim taught a similar graduate course at FAFU.

- **Huazhong Agricultural University, Wuhan, China.** After a visit by several Deans and Department Heads from Huazhong, a symposium was organized by Dr. Xianlong Zhang, Vice President of HUAZ. Eight faculty (6 from PLPM) led by Dr. LS Pierson traveled to Huazhong Agricultural University this past spring break for a 2-day symposium. Mutual research interests as well as teaching and graduate student exchanges were discussed. An MOU is being developed to further promote our relationship.

Future:

We continue to pursue international collaborations that can support and enhance our core mission to agriculture, Texas and its citizens. For example, several faculty traveled to China to explore collaborations with two universities (see above). However, in order to be successful, these international efforts require sufficient levels of support from the department, the college and the university.

2. Sustain and grow teaching effectiveness and learning excellence that prepares students for life-long learning.

A. Expand faculty mentoring for teaching.

The department encourages and has sponsored faculty participation in teaching workshops. Faculty members are recognized regularly for their teaching efforts. Measurements of faculty success in teaching include:

- **Dr. Karen-Beth Scholthof** received the 2008 Center for Teaching Excellence/University Writing Center "W-Course" Teaching Award.
- **Dr. Karen-Beth Scholthof** received the 2009 TAMU Association of Former Students Distinguished Achievement Award for Teaching.
- **Dr. Brian Shaw** received the Student-Led Awards for Teaching Excellence (SLATE), award for spring 2009 and also for spring 2010 (in 2010, only 5 were awarded in COALS).
- **Dr. Greta Schuster** received the 2008 and 2009 Texas A&M Kingsville Chancellor's Teaching Excellence Award.
- **Dr. Jason Woodward** was nominated for the 2009 Texas Tech University CASNAR award.
- **Dr. Leland S. Pierson III** received the 2006-2007 Outstanding Faculty Teaching Award from the College of Agriculture and Life Sciences at The University of Arizona.

Future:

The Department Head attends lectures by faculty in the department for the purpose of providing feedback support and suggestions. All faculty currently are evaluated by the Center for Teaching Excellence based on student evaluations and these ratings are discussed during the annual faculty reviews.

3. Increase basic and translational research.

A. Identify, build upon current strengths. The discipline of plant pathology covers a diversity of areas relevant to plant health and agriculture, from basic molecular studies to applied research. Being a relatively small department, each faculty member brings specific expertise and a unique perspective to the unit.

Current Focus areas and Research Strengths:

- Host-plant interactions.
- Bacteriology
- Bioenergy & Biotechnology
- Pathogenic fungi and mycology
- Disease resistance
- Virology & Bacteriophage biology
- Nematology
- Plant biology
- Ecology & evolutionary biology
- Waterborne pathogens
- Institute for Plant Genomics and Biotechnology

Extension Research:

The department is comprised of COALS, AgriLife Research and AgriLife Extension faculty.

Faculty	Research/Extension	Location
Dr. David Appel	Extension	College Station
Dr. Mark Black	Extension	Uvalde
Dr. Carlos Bogran (50%)	Extension	College Station
Dr. Ron French-Monar	Extension	Amarillo
Dr. George Di Giovanni	Research	El Paso
Dr. Erik Mirkov	Research	Weslaco
Dr. Tom Isakeit	Extension	College Station
Dr. Young Ki Jo	Extension	College Station
Dr. Gary Odvody	Extension	Corpus Christi
Dr. Kevin Ong	Extension	College Station
Dr. Charlie Rush	Research	Amarillo
Dr. Greta Schuster	Extension	Kingsville
Dr. Xiaofeng Wang	Research	Weslaco
Dr. Terry Wheeler	Research	Lubbock
Dr. Jason Woodward	Extension	Lubbock
Dr. Qingyi Yu	Research	Weslaco
Dr. Xin-Gen (Shane) Zhou	Research	Beaumont

The department has two plant disease diagnostic laboratories, the Texas Plant Disease Diagnostic Laboratory (TPDDL) located in the Centeq building on the College Station campus and the Great Plains Diagnostic Laboratory (GPDN) located at the Amarillo Research Center. Dr. Kevin Ong is the Director of the TPDDL and Dr. Ron French-Monar operates the GPDN laboratory.

Plant Pathology and Microbiology faculty are also working on important existing and emerging plant pathogens that threaten Texas agriculture and that of the U.S. Faculty perform research and field work supported by grants from several Texas commodity groups, including the Texas Pierce's Disease Research & Education Program and the grape industry, the Texas Corn Producers Board, Texas Cotton State support, Cotton Incorporated, Plains Cotton Improvement Program, Texas Citrus Mutual, and Texas Wheat Producers.

Future:

Further strengthening of the connections between faculty on main campus and those located at the Research and Extension Centers around the state is needed to increase the integration between basic laboratory research with field applications. Challenges include the distances across Texas, schedule conflicts between field studies and classes, and funding.

B. Promote research excellence. Examples of faculty members in the department who have been recognized recently for research excellence include:

- **Dr. Erik Mirkov** recognized by the Vice Chancellor at the 2010 Annual Patent Awards Luncheon for 4 US and 1 Australian issued patents.
- **Dr. Herman Scholthof** received the 2009 TAMU Association of Former Students Distinguished Achievement Award for Research.
- **Dr. Herman Scholthof** received the 2009 Ruth Allen Award, presented for outstanding, innovative contributions to research that has changed, or has the potential to change the direction of research.
- **Dr. Herman Scholthof** was elected a Fellow of the American Phytopathological Society in 2009.
- **Dr. George Di Giovanni** received the 2009 Faculty Fellow distinction, Texas AgriLife Research.
- **Dr. Brian Shaw** received the 2009 Alexopoulos Prize, the Outstanding Early-Career Mycologist Award awarded by the Mycological Society of America.
- **Dr. Marty Dickman** received the 2011 E. C. Stackman Award, granted to individuals of any country and nationality for outstanding achievements in plant pathology. Past recipients include Dr. Luis Sequeira and Dr. Norman Borlaug.
- **Dr. Marty Dickman** was recently elected an AAAS Fellow.
- **Dr. Mike Kolomiets** received the 2011 MEPS Outstanding Young Faculty Award.

Imperative 2: Strengthen our Graduate Programs.

1. Increase and diversify our graduate student body.

The graduate program in the Department of Plant Pathology and Microbiology has been revised several times over the years. The Graduate Program Committee is charged with the oversight of the graduate program curriculum.

A. Increase efforts to recruit underrepresented students.

The department encourages eligible students to apply for one of several possible fellowship programs, including:

- **Alfred P. Sloan Foundation** under-represented minority graduate recruitment. The Alfred P. Sloan Foundation's Minority Ph.D. Program has two components. The Ph.D. component offers substantial scholarship support to underrepresented minority students who are beginning their doctoral work in engineering, natural science and mathematics. Since its establishment in 1995, the program has provided direct support to over 900 minority Ph.D. students in these fields. The smaller Feeder component offers underrepresented minority B.S. or M.S. student's access to select faculty and departments that have demonstrated success in sending their students on to doctoral programs.
- **MANRRS (Minorities in Agriculture, Natural Resources, and Related Sciences) program.** The MANRRS program is aimed at the development of leadership and professional skills and scholarly excellence among members in the early stages of their careers. The overall objective of MANRRS is to foster inclusion and advancement of members of ethnic/cultural groups underrepresented in agricultural and natural resource sciences and related fields in all phases of career preparation and participation.
- **Hispanic Leadership in Agriculture and Environment Fellows program.**
- **Association for Former Students Graduate Merit Fellowship.**

B. Increase financial support.

Currently for graduate student support, the department receives base funding plus variable amounts in a graduate enhancement account. The new department head negotiated 2 yrs. of additional funding, expiring September 2011. These monies are primarily used for recruitment of new students. Faculty are expected to support their students from federal or state grant funds, or from teaching assistantships. A major area of debate, for all faculty, is whether to use limited (and increasingly precious) support monies for graduate students or for post-doctoral fellows. During times of limited funding opportunities, the need for rapid progress on research areas often places the need for more productive post-doctoral students above the longer term training of graduate students.

2. Increase opportunities for experiential learning that prepares students for life.

A. Improve preparation in classroom teaching.

The department has been updating classroom technology by the installation of Smart Boards in most of its classrooms. One teaching laboratory had new chairs installed in fall, 2009. Since September 2009, several updates to the Peterson building 1st floor hallway have been

implemented, including a monitor that displays information on the department, its faculty, its programs, and additional information of current interest, such as seminars and departmental functions.

The department has limited funds available to support student travel in order to present research at national and international meetings. Attending and presenting their work, whether orally or at poster sessions, is an important teaching component and trains students to become better scientists and helps to establish useful collaborations and future contacts. In addition, the Department Head is supportive of Post-doctoral students to guest lecture in specific classes to gain experience for the next level of their professional career.

B. Broaden access to our academic programs beyond College Station.

This is a new area for the department and we are beginning to plan how best to do this. The department currently integrates teaching, research and extension as they are inseparable in the field of plant pathology. Plant Pathology is a hands-on major. The department has several faculty associated with other educational centers around the state. These faculty include Dr. Jason Woodward who has a 75% AgriLife Extension Specialist and 25% Instruction appointment at Texas Tech University in Lubbock to teach plant pathology. He also serves as major professor and committee member for graduate students at Texas Tech. Dr. Greta Schuster has a 25% AgriLife Extension appointment and a 75% teaching appointment at the Texas A&M Kingsville campus. She currently teaches plant pathology and trains undergraduate and graduate students.

Imperative 3: Enhance the Undergraduate Academic Experience.

Since its inception in 1990, the undergraduate Bioenvironmental Sciences major has grown in size from 153 majors in 1992 to 227 majors in 2010. The major graduates on average nineteen students per semester. The BESC major has an excellent Student-to-Faculty ratio, with 227 students being taught by 20 faculty (ratio = 11.4 to 1). In addition, all BESC courses are taught by tenured or tenure-track faculty. More detailed information regarding the BESC major are provided in the section on Teaching.

1. Enhance UG exposure to research.

A. Promote REUs. All faculty on campus are involved in training undergraduate researchers. More information on the departmental REU programs is in the Teaching section.

B. Enhance honors programs. Dr. Karen-Beth Scholthof led the effort to develop a Honors Program for the Bioenvironmental Sciences major. This is the first honors program in COALS. Please see the Undergraduate Teaching section for more information on the BESC honors program.

C. Increase financial support for UG research. All BESC majors must complete an internship in order to be able to graduate. Many students fulfill this requirement by working in a research laboratory. As indicated in the Undergraduate Teaching section, since 2003 PLPM faculty have trained over 200 undergraduate students in their research laboratories.

2. Provide experiential learning opportunities that foster critical thinking, complex problem solving, strong communication skills, community interaction, and social/global awareness.

A. Expand out-of-classroom learning (Study Abroad).

The department has had a number of undergraduate students participate in Study Abroad programs in Brazil, Costa Rica, Australia, Fiji, Ireland, Belgium, and Dominica.

Imperative 4: Diversify and globalize the A&M and College Communities.

1. Enhance and broaden the student's educational experience to make them better understand the world around them and how different perspectives contribute to its strength.

A. Increase international activities.

B. Increase diversity of the student body.

Overall demographics of the undergraduate BESC major for the years 2008-2010:

Gender	2008	2010
Male	44.5%	36.4%
Female	55.5%	63.6%

Ethnicity	2008	2010
African American	5.3%	6.1%
Hispanic	24.5%	33.3%
Native American	1.9%	6.1%
Asian	5.7%	27.3%
White	62.6%	27.2%

2. Increase impact of faculty by broadening their experiences.

Tenured faculty members at Texas A&M University have the ability to apply for Faculty Development Leave. Recent examples:

- Herman Scholthof spent 6 months in the laboratory of Dr. Peter Moffett whose research group focuses on molecular resistance mechanisms of plants against pathogens at the Boyce Thompson Institute (BTI) for Plant Research at Cornell University in Ithaca New York. Dr. Scholthof's goal was to learn new research techniques applicable to my own molecular virology program by performing hands-on state-of-the-art research in the laboratories and greenhouse facilities at BTI. To date, one publication has resulted from this visit.
- Karen-Beth Scholthof had a 6 month Visiting Scholar appointment in the Department of Science and Technology Studies at Cornell University. Her visit enabled her to continue her NSF-funded research on the history of plant virology, specifically *Tobacco mosaic virus* in the early 20th century in the United States. She spent much of the time intensively reading of plant pathology, plant genetics, and virology literature from 1900-1935 and the historiography of these topics at the Mann Agricultural Library. She also worked at the Kroch Library (Archives) to investigate the development of the American Phytopathological Society (APS), and the links between Cornell University Plant Pathology and the development of the Boyce Thompson Institute. She also prepared a manuscript on F. O. Holmes and the local lesion assay. . To date, two publications resulted from this visit.

- Mike Kolomiets spent 6 months in the laboratory of Dr. Ivo Feussner at the Institute of Plant Biochemistry, University of Goettingen, Germany. Dr. Kolomiets's Faculty Development Leave was to gain analytical expertise in modern, state-of-the-art biochemical techniques of plant metabolome and lipidome profiling. While learning new metabolome analyses techniques, another important goal was to profile and quantify lipids and major plant hormones in the maize lipid metabolism mutants that Dr. Kolomiets has generated at Texas A&M. This training was necessary to take his already successful research program in maize molecular genetics to the next level of excellence and competitiveness.
- Herman and Karen-Beth Scholthof will be giving an invited lecture series on Plant Virology in May at the L. N. Gumilyov Eurasian National University, in Astana, Kazakhstan. One of their goals is to recruit new graduate students to Texas A&M.

In addition, as a result of our interactions with Fujian Agriculture and Forestry university and Huazhong Agriculture University several faculty have taken the opportunity to travel and provide courses at these institutions. For example:

In the summer of 2011, Drs. Daniel Ebbole and Won-Bo Shim and Drs. Michael Kolomiets and Shim taught graduate level courses in "fungal genetics/genomics and fungal-plant interactions" at Fujian Agricultural and Forestry University, Fuzhou, Peoples Republic of China.

Several additional faculty are initiating their own international collaborations to expand their interactions which will greatly benefit the department, the college and the university.

Imperative 5: Build engaging connections beyond the university.

1. Establish new and utilize existing partnerships with industry, communities and other stakeholders.

Many faculty in the department are involved in research and field experiments funded by Texas agriculture commodity groups and companies. In addition, many are involved with public groups.

Examples of Commodity Group Interactions:

Cotton Incorporated	Texas Nursery Growers
National Peanut Board	Texas Peanut Producers Board
National Cotton Foundation	Texas Potato Growers
Plains Cotton Growers	Texas Rice Research Foundation
Texas Arboriculture Industry	Texas Sorghum Board
Texas Citrus Mutual	Texas Vineyard Owners/Managers
Texas Citrus Producers	Texas Wheat Producers Board
Texas Corn Producer Board	Turf Producers of Texas
Texas Fruit Grower Association	Texas Department of Agriculture (government)
Texas Grape Growers	
Texas Landscape Industries	

Examples of Industry Interactions:

ACI	DuPont
Agraquest	Fibermax
Americot-Nexgen	Frito Lay
Arysta	GmBH
Bayer CropScience	Monsanto
BASF	Natural Industries, Inc.
Becker Underwood	Nichino America
Biotechnology and Research Development Corporation	Pasteuria BioSciences
Bioworks	Pioneer Hybrid
Cerexagri	Plant Biosciences Ltd.
Cheminova	Prophyta
Cleary	Quali-Pro
Dynagrow	Sipcam
Devgin	Syngenta
Dow Agrosiences	Valent

Examples of Public Interactions:

Blackland Urban Forestry Council
Citizen Forester Program
Coastal Ben Pest Control Association
Future Farmers of America
International Society of Arboriculture Texas
Lubbock Arborists
Lubbock Petal Pushers
Master Gardeners
Texas Bobwhite Brigade
Texas Envirothon, Environmental Institute of Houston
Urban Plant Detectives Program