

## **APPENDIX F**

### **Agronomy Strategic Plan 2004-2009**

# Department of Agronomy Strategic Plan

**2004-2009**

## **Mission**

The mission of the Agronomy Department at Purdue University is to serve our broad-based clientele by providing progressive undergraduate, graduate, and extension education programs; conducting innovative and relevant research in the crop, soil, and environmental sciences; and engaging with partners in the public and private sectors.

## **Vision**

The Agronomy Department at Purdue University strives to provide global leadership in the crop, soil, and environmental sciences, and seeks to enhance the quality of life through agronomic education that results from discovery and engagement.

## **Core Values of the Department of Agronomy**

As the Department of Agronomy at Purdue University, we value:

1. excellence and creativity in our education, discovery, and engagement activities
2. interdisciplinary approaches to addressing our mission
3. unrestricted access to our programs
4. understanding and solving problems of our diverse clientele
5. collegiality in our relationships with each other and with our clientele
6. having a positive presence among our constituency regionally and nationally
7. the success of our students, staff and clientele

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## **Introduction**

The Department of Agronomy has a rich tradition of discovering and disseminating information needed by the public to make informed decisions about agricultural and environmental issues. We recognize that there are no boundaries to those we serve. Our clientele consists of students, parents, those involved in the private and public sector; farm producers, state and federal legislators, alums, the citizens of Indiana, the U.S. and the world. We are committed to developing sound approaches to solve problems and enhance productivity to improve the quality of life and to ensure agricultural and environmental sustainability worldwide.

The Agronomy Department has four signature areas:

1. Plant Genetics
2. Environmental Soil Science and Landscape Processes
3. Cropping Systems and Plant Nutrition
4. Turfgrass and the Urban Environment

Our goal is to be a premier academic institution in research and education by distinguishing ourselves in character, student training and research accomplishments, and by directing our human and financial resources towards those opportunities that will provide the greatest impact in each of our areas of emphasis.

Our strategic planning process has taken into consideration the initiatives developed by the University and School of Agriculture and reflects, where appropriate, those initiatives.

## **A. Preeminence in Graduate Education**

**Goal A1: Attract and retain highly qualified students into our graduate programs.**

### **Strategies:**

- Develop a coordinated marketing plan for potential students using the web, recruitment programs, and brochures to advertise the strength and diversity of our graduate program.
- Beginning spring 2004, advertise on our web site and other graduate focused publications the following recommended minimum GRE scores for Ph.D. students entering the program in fall semester 2004: 450 on the verbal; 600 on the quantitative; and 4.5 on the analytical test.
- Engage all faculty in graduate education.
- Enhance the cultural, ethnic, and academic diversity of our students by recruiting from a broad spectrum of colleges and universities, including four-year liberal arts colleges, historically black universities, historically Hispanic universities, tribal colleges, and other minority serving institutions.
- Provide competitive stipends.

### **Metrics:**

- Increase the total number of graduate students to 100 by 2008, and the average number of graduate students *per research FTE* to 4 (with a minimum of 1 graduate student per faculty member).
- Increase the average incoming GRE scores as compared to 2003 values.
- Increase the number of graduate students from underrepresented groups to 10% of our student population.
- Increase and maintain our graduate assistant stipends in the upper 25<sup>th</sup> percentile of average stipends offered by our benchmark institutions.

**Goal A2: Enhance the quality and value of our graduate education program.**

### **Strategies:**

- Develop and implement competency-based qualification exams that students must pass to be considered doctoral candidates.
- Develop appropriate assessment tools to ensure academic excellence of our outgoing graduate students.
- Develop a feedback instrument/survey that graduate students may use annually to critically evaluate their mentors, research programs, the department, and the university.
- Revise the graduate curriculum (500- and 600-level courses) by Dec. 2004 and implement revisions by Fall, 2005. Thereafter, the graduate curriculum will be reviewed annually.
- Coordinate our course offerings with the University to reduce duplication of efforts and optimize faculty time.

- Develop joint courses and/or curricula in the soil and crop sciences with peer institutions.
- Establish two, graduate level distance education courses in response to clientele interest.
- Develop and implement a survey instrument for program/department/university evaluation by graduate students by May, 2005.
- Establish a faculty-mentoring program aimed at improving faculty skills in graduate student training.
- Evaluate the effectiveness of teaching assistantship distribution and use for graduate education by 2004, and implement recommendations for TA use by fall 2005.
- Provide interested departmental graduate students a TA or internship opportunity.
- Encourage and expect every graduate student to attend at least one scientific meeting annually by 2008.

*Metrics:*

- Reduce the number of graduate students changing thesis programs to non-thesis programs.
- Increase student feedback on faculty mentoring and program enhancement.
- Attain certification of at least 50% of Ph.D. recipients through one of the University's TA Certification Programs by 2008.
- Attain a placement rate for our graduate students equal to or exceeding the top three benchmark universities having comparable programs.
- Increase the number of graduate student internship experiences.
- Increase the number of graduate students participating at scientific meetings.

**Goal A3: Increase funding for graduate student support.**

**Strategies:**

- Engage industry in providing financial support of graduate students and research.
- Look for ways to reallocate departmental dollars to support graduate assistantships and associated research projects.
- Submit one training grant application to a federal program in the next two years.
- Where appropriate, include at least one graduate assistantship for each grant application.
- Communicate to administration the need to reduce graduate fee remissions and fellowship tuition costs so that the total cost (salary, fringe benefits and indirect costs combined) of a half-time graduate research assistant does not exceed 50% of the cost of a post-doctoral research associate.

**Metrics:**

- Increase departmental funds available for graduate education.
- Increase the number of graduate students funded by grant dollars.
- Increase funding of assistantships/fellowships by private industry, foundations, and other non-traditional sources.

## **B. Preeminence in Undergraduate Education**

**Goal B1: Recruit and retain highly qualified and diverse students into our undergraduate programs.**

**Strategies:**

- Develop and implement a marketing plan that includes web-based information, to increase awareness of our undergraduate programs and scholarships.
- Raise awareness across campus and to the non-agriculture audience of Agronomy and its diversity of studies and opportunities.
- Develop specific strategies for increasing diversity in our student population.
- Solicit alumni and industry support of scholarship funds for incoming and current students.

- Develop an Agronomy Ambassadors program to support recruitment and enhance the departmental image.
- Beginning Fall, 2003 offer a new freshman orientation course to expose students to the educational process at Purdue and to the diverse discipline of Agronomy.
- Engage alumni, off-campus extension personnel and on-campus faculty and staff in regional informational and recruitment activities.

**Metrics:**

- Increase the number of undergraduate majors by 5% from the 2002 enrollment.
- Increase the academic quality of entering first year students by accepting a freshman class with SAT scores that on the average are 30 points above the current class (2003) by 2006 and 50 points higher by 2008.
- Increase the number of under-represented minority students in our programs by 5.
- Increase the money available for undergraduate scholarships by 25%.

**Goal B2: Improve the quality and value of our undergraduate education programs.**

**Strategies:**

- Systematically review undergraduate curricula and courses including both majors and minors through a formalized review process and through external evaluation using surveys and focus groups of graduating seniors, alums (3 to 5 years out), and stakeholders.
- Broaden the curriculum to increase the amount of writing and speaking skills and include more management courses.
- Evaluate our effectiveness in servicing the educational needs of other departments and schools.
- Better inform faculty about internship, job, research, and service learning opportunities for our students and provide up-to-date information on counseling procedures that will ensure quality counseling for our students.
- Develop a website for each Agronomy course.
- Utilize a variety of educational delivery systems, including distance education technologies, to address the needs of our diverse audiences.
- Encourage students through advising and the AGRY 398 sophomore seminar to participate in undergraduate research, the Honors Program and/or an accelerated M.S. degree program.
- Integrate written, oral, quantitative skills, and field experiences into our courses to increase specific competencies of our students in these areas and assess these competencies through formal testing and validation procedures.
- Involve more faculty in undergraduate mentoring and instruction.
- List certification opportunities for our graduates/students on the departmental web site and discuss these in our seminar courses.
- Develop a peer mentoring process for the faculty that encourages regular peer review of courses and provides for workshop and seminar programming related to teaching and learning.
- Seek external funding from competitive sources to support new and novel initiatives in our undergraduate program.
- Increase the role that our alumni play in interacting with current students to motivate and inform.

**Metrics:**

- Annually meet with employers and alumni to assess the competencies of our students in the workplace.
- Attain a placement rate for our students equal to our top three benchmark Agronomy programs.
- By 2008 develop and offer three Agronomy credit courses to off campus students via distance education.
- By Fall 2004 100% of our courses will have a web presence.
- Offer at least one Study Abroad Course every other year.

- Increase our student participation in Study Abroad to 20% of our graduates.
- Increase the number of Agronomy students pursuing certified professional status (e.g. CCA, Certified Soil Scientist).

**Goal B3: Inform primary and secondary school students, teachers, and counselors, and the general public about ways agronomic principles can assist them in the understanding of science, food production, natural resource management, and environmental stewardship.**

**Strategies:**

- Increase our presence in K-12 classes by developing additional agronomic science programs and materials and by providing guest speakers to explain the role of science in agronomic fields of study.
- Regularly visit minority and urban high schools to “tell the story” of Agronomy and its importance in solving societal issues.
- Market our programs and career opportunities to students, counselors, and science teachers at the K-12 levels.
- Continually update our high school curriculum materials that are available from the Media Distribution Center (e.g. Indiana Soils: Evaluation and Conservation), determine their distribution (amount and location) and tabulate the number of students who use these materials and who participate in soil and crop judging contests.
- Survey teachers and students who have participated in our programs to determine impact of programs and to solicit ideas for potential programs to develop.
- Ensure that two articles per month about agronomy are submitted to the popular press for publication and have them available on our website.

**Metrics:**

- Increase hits and downloads from our web pages containing resources for K-12 teachers and students.
- Increase by 20% the number of contacts with K-12 teachers and students.
- Maintain or increase the number of high school students participating in competitive crop, soil, and environmental science activities within the state.

**Goal B4: Provide a well-coordinated student-mentoring program with increased faculty involvement in undergraduate research, student organizations, and academic counseling.**

**Strategies:**

- Develop an orientation program for all faculty advisors and increase the effectiveness of advisors through enhanced communication.
- Utilize undergraduate and graduate students in the mentoring/tutoring and teaching process.
- Develop a mechanism by which first year students interact with upper class students to encourage natural opportunities for mentoring.
- Recognize and reward faculty involvement in student advising, student activities, and undergraduate research.
- Develop a plan to enhance guidance for at-risk students.

**Metrics:**

- Increase the number of faculty involved in academic advising, directing undergraduate research, and supporting student activities by 25%.
- Decrease the number of students on academic probation by 25%.

**Goal B5: Develop in our undergraduate students leadership and entrepreneurial skills, a dedication to service, and the desire and ability to critically assess issues at**

**local, regional, national, and international levels so that they can be engaged citizens.**

**Strategies:**

- Develop courses that nurture our students' leadership, entrepreneurial, and issue analyses skills.
- Actively encourage student participation in study abroad programs and internships.
- Encourage faculty to participate in international educational programs (i.e. international sabbaticals, Fulbright program) and actively pursue sources of funding for these activities.
- Develop capstone experiences that include an integrated senior level course, seminar, senior project, service learning activity, internship, and/or independent research opportunity.
- Annually review course, curricula, and capstone experiences for our students to ensure that the above goal is met.

**Metrics:**

- Increase the number of students participating in leadership positions.
- Increase the number of our students participating in community service activities.
- Increase the number of our students participating in international activities.
- Increase the number of students participating in internships.

## **C. Excellence in Extension Education**

**Goal C1: Increase stakeholder input for Extension program development.**

**Strategies:**

- Throughout the year, discuss issues identified by our clients that might be addressed by Extension and associated research activities.
- Enhance collaboration among Agronomy Extension and Non-Extension staff personnel.
- Increase involvement with existing Purdue CES Common Interest Groups (CIGs) to better identify research needs and educational concerns.

**Metrics:**

- By December, 2005, develop and distribute an annual departmental report to stakeholders describing interim results of applied research being conducted by Agronomy staff members, and publish on the department's Extension Web site.
- By December, 2005, develop and use standardized evaluation forms to improve and document impact of programs organized by departmental specialists.
- Increase annual input from ANR educators and those who serve on the Agronomy External Advisory Council.
- Schedule 8 to 10 meetings per year for Agronomy Extension staff to discuss program issues, staff responsibilities, and stakeholder input.
- Increase collaboration with PAC superintendents, Farm Director's Office, campus CIG's, and CES County Educators to discuss regional research and educational issues.
- All departmental specialists will participate in their relevant CIGs and collaboratively plan educational programs by 2005.

**Goal C2: Increase applied research to improve the profitability and sustainability of clientele groups in Indiana.**

**Strategies:**

- Identify and pursue creative opportunities for funding applied research.

- Foster additional opportunities for meaningful research collaborations with farmers, conservation associations, industry representatives, local and state government agencies, and county Extension educators.
- Actively seek graduate student participation in applied research.

**Metrics:**

- Double the number of federal, regional and corporate grant applications from Extension staff.
- Establish at least one substantial endowment fund to support applied research.
- By 2008, increase to 25%, our applied research that are multi-departmental and (or) use a multi-institutional approach.
- By 2008, conduct at least 20 % of our field research experiments at off-PAC locations.
- By 2006, conduct 1 workshop per year in experimental design, statistical analyses, data interpretation for groups such as farmers, educators, ag industry who desire to conduct their own on-farm research trials.
- Each faculty with a majority Extension appointment (at least 50%) will support a minimum of 2 graduate students.

**Goal C3: Improve the efficiency and quality of Extension education delivery and programming.**

**Strategies:**

- Prioritize Extension activities relevant to agronomic issues among campus- and county-based CES staff.
- Improve efficiency of on-site education activities at the Agronomy Center for Research and Education (ACRE).
- Develop more statewide educational activities for Certified Crop Advisors (CCA's) and registered soil scientists, and increase multi-state collaborations in educational programming.
- Continue development efforts to raise funds for a classroom facility at the ACRE.
- Work with staff in Ag Communications to market specific educational programs.
- Assume more active educational involvement in issues of public concern such as agricultural biotechnology, soil and water quality, on-site sewage disposal, agro-terrorism, site-specific soil and crop management, and loss of prime farm land.
- Establish a uniform minimum fee for each continuing education credits for professional certification programs offered at public- and privately-sponsored conferences/workshops in Indiana.
- Standardize fees for educational activities for professional certification.

**Metrics:**

- By Fall 2004, annually distribute a list of prioritized issues to be addressed by Extension, and show how programs will be coordinated to avoid duplication and improve efficiency.
- Increase the number of publications and other educational relevant resources released to our constituents.
- By 2006, double the annual number of newsletters or periodical articles written by Agronomy Extension as compared to the average number from 2000-2002.
- By 2007, have a comprehensive web site for each Extension Specialist representing his/her respective areas of outreach.
- Maintain involvement in jointly sponsored programs with state and regional boards for CCA's, turfgrass associations, and registered soil scientists.
- By 2005, establish a list of staff members who will develop at least one public concern issue paper per year in our competency areas and disseminate to the press and relevant clientele.
- By 2005, annually develop and distribute directories of University Extension Specialists that describes relevant topic area expertise.
- Increase funding of our programs through fee based educational programs.

**Goal C-4: Improve department's outreach via distance education.**



**Strategies:**

- Utilize more distance education technologies to address stakeholder needs.
- Acquire the logistics and technical support to deliver more distance education.
- Assess client satisfaction with distance education.

**Metrics:**

- By 2006, increase distance delivery of our educational programs to reduce participation at county meetings for small audiences, and to save travel time and address multiple audiences.
- Increase the number of Powerpoint™ presentations (slide sets with accompanying text) accessible to Extension educators for program use.
- By 2008, develop at least 4 self-study modules for CCA continuing education credits.
- Increase outreach activities with the new State museum.

*D. Preeminence in Discovery*

Goal D-1: Develop intellectual resources that integrates basic and applied sciences to address major agricultural, ecological, environmental, and other societal concerns.

**Strategies:**

- Identify and prioritize short and long term issues that must be addressed through research, teaching and outreach in the soil and crop sciences.
- Attract and retain an outstanding and diverse faculty to conduct research and teach in key soil and crop science disciplines to address regional, national, and international agricultural and environmental issues. Fill faculty positions in the areas of:
  - Soil Geomorphology / Pedology by 2005
  - Earth Observation / Remote Sensing by 2005
  - Soil Fertility / Crop Nutrient Management by 2005
  - Soybean Extension by 2005
  - Regional Scale Climatology by 2005
  - Turfgrass Physiology by 2005
  - Soybean Genetics and Breeding by 2006
  - Quantitative Genetics by 2006/7
  - Functional Biology by 2006/7.
  - Biogeochemistry by 2006/7
- Emphasize research on plant function and response to the environment that accelerates implementation of genomic approaches and emerging technologies to crop improvement.
- Develop tangible research links from genomic/genetic and physiological studies to their implementation in crop management strategies that can overcome environmental limitations to crop productivity.
- Continue to support programs that support the integration of molecular and atomic scales with systems and landscape scale processes.

**Metrics:**

- Faculty hired in 10 positions by 2007
- Increase ethnic and gender diversity in faculty hires.
- Have at least 10% of the faculty participate in university-sponsored diversity workshops each year so that all faculty members will have participated by 2009.
- Hold at least monthly research-focused meetings among departmental faculty to discuss common interests and concerns and to facilitate interactions and establish an environment in which interaction among the basic and applied sciences occur regularly.

- By 2005, develop new web pages for the soil and crop science groups to educate our constituents about our research and education programs and review and update them every 6 months.

***Goal D-2: Obtain state of the art equipment and technologies for conducting progressive research***

**Strategies:**

- Identify and prioritize equipment needed to conduct cutting edge research that is not typically part of a standard research grant application.
- Through a combination of grants, state support, and endowments develop the financial base for the purchase and maintenance of state-of-the-art equipment.
- Through a combination of grants, state support, and endowments develop the financial base needed to maintain long-term applied research projects.

**Metrics:**

- Compile a list of available equipment among the soils and crops groups and assemble and prioritize needed equipment by July, 2004.
- Submit at least one grant annually for new technology and equipment to conduct the highest quality applied research. Pursue all possible funding sources and aggressive pursue matching funds from gifts, department, and university.

***Goal D-3: Enhance collaborations within and outside the department.***

**Strategies:**

- Strengthen collaborations with the Departments of Chemistry, Earth and Atmospheric Sciences, Civil Engineering, and departments in the School of Agriculture especially emphasizing Agricultural and Biological Engineering, Botany and Plant Pathology, Horticulture, and Forestry and Natural Resources.
- Strengthen collaborations with the USDA ARS National Soil Erosion Research Laboratory.
- Enhance collaborations among the soils and crops faculty in Agronomy.

**Metrics:**

- Increase the number of interdisciplinary faculty hires involving AGRY and departments and schools across campus.
- Increase the number of faculty from other departments and schools serving on AGRY graduate student committees.
- Increase the number of joint publications and funded projects among faculty within the AGRY department and across campus.
- Increase the number of joint seminars among departments, schools, and institutes.
- By 2005, have at least two newly funded projects among the soils and crops faculty in Agronomy that address research in the following areas: phytoremediation, soil-turf interactions, phosphorus management, tillage practices, and plant pathology.
- Increase incentives such as research assistantships, matching funds and seed grants for collaboration among faculty to develop joint research proposals and co-advise graduate students that work on joint projects.
- Increase linkages to international research centers.

**Goal D-4: Increase departmental research funding.**

**Strategies:**

- Increase awareness of available funding opportunities.
- In support of his/her program, each faculty member is expected to pursue extramural funding in the form of corporate, foundation and other non-federal funding as well as intramural, federal competitive funding.
- Each faculty member with majority assignment in research will be expected, individually or collaboratively, to carry and/or pursue at least one national-level (e.g., NRI, DOD, NSF, EPA, etc.) research grant each year.
- Each faculty member with majority or minority assignment in research will be expected to lead or play a major role in at least one interdisciplinary grant and/or proposal each year.
- Assist faculty in enhancing grantsmanship skills and funding strategies.

**Metrics:**

- Increase the number of federal grant proposals, the number of applications to corporate and *other non-federal sponsors and the number of applications to competitive on-campus programs submitted from the department by December, 2005.*
- *Encourage and increase participation in annual grant writing workshops.*

**Goal D-5: Enhance the impact of departmental research on science and society.****Strategies:**

- *Have a unified and collective effort in publishing results and findings in premier refereed journals as well as translation of research into technical bulletins, popular press articles and other media.*
- *Establish an external recognition of specific discipline of our faculty and programs through active participation at national and international meetings and symposia.*
- *Provide relevant research findings to government and non-government agencies, and enhance communication between scientists, farmers and non-farm members of the public.*
- *Encourage participation of adjunct faculty from industry on graduate advisory committees, and use of student internships in industry research laboratories for portions of their thesis.*
- *Develop a program in which private sector researchers conduct research in the department.*

**Metrics:**

- *On average, faculty will publish two refereed publications per year.*
- *At least one member of a program will present findings at a national or international meeting or symposium per year.*
- *At least one member of a program will present or publish scientific results to a broader, lay-audience per year (e.g., field days, school classes, etc.).*
- *Increase scientific linkages with the private sector by increasing organizational visits and scientist exchanges.*
- *Present research agenda to the external advisory council.*
- *Increase faculty participation on state-wide and regional boards.*

**Goal D-6: Increase undergraduate involvement in departmental research.****Strategies:**

- Develop a departmental program, marketed over the internet and potentially supported by corporate sponsors, through which top undergraduate students are regularly recruited campus-

wide into research (non-dishwashing) experience in departmental laboratories for periods of at least one year.

- Monitor student performance in key courses and labs in sophomore year and recruit for lab positions for junior (and possibly senior) year

**Metrics:**

- Increase to 40 the number of undergraduate students working on crop and soil science projects in departmental laboratories.
- Have at least half of these undergraduates presenting data at regional, national or international meetings.

