

**Department of Plant Sciences Academic Plan  
February 10, 2009**

**Mission and aspirations**

The Department of Plant Sciences serves the scientific, technical, and educational needs of students, Wyoming citizens, and the global scientific community in the area of sustainable plant production agriculture. Through research, extension and instruction, we generate and distribute unbiased, scientifically-based information on food, forage, and specialty cropping systems, biological and ecological sciences, and conservation of soil, water, and energy. The department provides access to information from global sources, facilitates open and respectful dialogue, and encourages sound approaches to sustainable agriculture.

**Previous planning accomplishments**

1.	Sustainable agriculture	Hired two faculty: Weed Biology & Ecology; Forage Agroecology. Three forage legume cultivars released. New courses: Western Landscape Design; Plant Materials. Continued leadership at state R&E Centers. Evaluation of biotechnology-enhanced crop cultivars.
2.	Horticulture position	Endowed position at Sheridan College funded and approved.
3.	Graduate programs	Graduate enrollment not increased due to faculty retirements. Current graduate enrollment is 1.9 graduate students per graduate faculty FTE, however.
4.	Interdisciplinary graduate programs	No students currently enrolled in interdisciplinary programs but 3 faculty participate in the existing MCLS and Ecology programs.
5.	ENR instruction	Participation in ENR Capstone Course.
6.	Double enrollment in Agroecology	Undergraduate enrollment increased by 50%
7.	3 <sup>rd</sup> year Agroecology at NWC, Powell.	Suspended. No UW teaching faculty currently at Powell. Focus shifted to Sheridan with development of 3+1 Agroecology Horticulture program at Sheridan College.
8.	Contribute to Biology teaching program	Goals exceeded: Biology Honors (LIFE 1010); Plant and Fungal Biology (LIFE 2023); Genetics (LIFE 3050)
9.	Clarify department expectations of faculty	Both Research and Extension expectations are documented. Expectations for Teaching quality and quantity are currently being developed.
10.	Strengthen student assessment	Accomplished with a formal assessment of graduating Agroecology students. Further development of assessment tools and procedures is ongoing.

**Relevant institutional issues**

The Plant Sciences academic plan is consistent with several university planning motifs. Within the motif of access, the Agroecology program operated by Plant Sciences is one of the most flexible and accessible undergraduate programs at UW. It is a natural choice for non-traditional students and will become more so as collaborations are developed with Sheridan College and other community colleges in the state. Also consistent with access, Plant Sciences is seeking endowment of graduate fellowships. The E.H. Lloyd Graduate Fellowship for Summer Research is one of several that have been established already.

Under the motif of excellence, Plant Sciences contributes to three specified areas of distinction in the emerging university plan: critical areas of science and technology, environment and natural resources, and life sciences. Energy is a critical area of science and technology in the UW plan. Faculty in Plant Sciences are currently engaged in biofuels research and are necessary contributors to the study of how agricultural land can be used for wind and solar energy production. In the area of environment and natural resources, Plant Sciences delivers the Agroecology undergraduate program, which trains students explicitly to solve the problems of sustainable agriculture. In the area of life sciences, Plant Sciences is necessarily central to the plant biology initiative proposed in the most recent university plan draft because of our ability to translate recent progress in plant genomics into agricultural and biotechnology applications. Also under life sciences, Plant Sciences plays an important role at the agricultural research and extension centers. These are biological field stations in every respect.

Under the motif of leadership, Plant Sciences is intensively engaged in delivering extension and outreach to agricultural producers in the state. Discussion of a non-thesis master's degree intended to prepare extension educators for both agriculture and small business extension is proposed in our plan.

### **Action items**

**1. Increase Graduate and Undergraduate Enrollment** — Plant Sciences will change the name of its graduate program from Agronomy to Agroecology and consider revisions of the program consistent with its mission of training students in the science and practice of sustainable plant production. Mechanisms by which appropriate graduate faculty from other UW departments could participate in the Agroecology graduate program will be explored. These steps will increase graduate enrollment, as occurred when the Plant Sciences undergraduate program was revised and renamed Agroecology in 1993. In addition, the department currently lacks a Plan B degree program. Adding a Plan B option under the Agroecology M.S. would allow an extension specialization designed to train and develop extension personnel. Such an option would require an extension internship, involvement with the R&E centers throughout the state, and opportunities for non-traditional students to participate in the program. The program would complement existing internship programs in the college and help fill the need for qualified individuals in extension programs nationwide. To meet the increases in graduate enrollment generated by this action item, faculty will increase grant and soft money support to fund additional graduate assistantships. Adding a greater research focus to undergraduate studies will also improve enrollment and outcomes for both the graduate and undergraduate programs.

To increase undergraduate enrollment, commitment and involvement with the planned 3+1 Horticulture program at Sheridan College is required. The Sheridan program alone could boost Agroecology undergraduate numbers by 25-50% in the next five years. Additionally, the department will be more proactive in helping students to acquire state and national certifications. Certification for a state applicator's license, certified ASA crop advisor, and certified horticulturist are examples of available programs. Awareness of these programs would benefit and enhance the Agroecology program and could increase enrollment. Finally, Plant Sciences will revise both the undergraduate and graduate degree programs so that specializations can be

added on transcripts. Specializations would highlight and reflect intensified areas of expertise under the broad Agroecology degree title.

**2. Plant Protection** — Plant Sciences will strengthen its leadership in plant protection on campus, around the state, and across the region. Recent departures of faculty in this area have weakened our ability to meet the needs of students, the state and the nation. Therefore, it is critical to increase the number of faculty working in plant protection to maintain and strengthen our leadership role. Filling the currently vacant invasive weeds position will help but is not sufficient. Inviting faculty with plant protection responsibilities to move from other departments to Plant Sciences, especially faculty with entomology expertise, will be explored. Upcoming retirements of current plant protection positions in the Department are expected. Attempts will be made to fill these positions with broadly trained faculty whose expertise may lie partly outside traditional plant protection disciplines.

**3. Agronomic Crop Production** — Plant Sciences will improve its existing contributions to crop production agriculture through innovative research initiatives, modern extension and outreach activities, and effective teaching efforts. To accomplish this, targeted initiatives appropriate to our resources will be undertaken in the areas of modern forage-based production systems, traditional and alternative crops, crop physiology, and biotechnology. Emphasis will be given to integrate crop physiology and biotechnology courses that will enhance not only student enrollment but also research and teaching outcomes. Extension efforts will play a major role in disseminating findings to end-users and stakeholders outside the University.

**4. Specialty Crop Agriculture** — Plant Sciences will increase its visibility in the area of specialty crops by expanding extension, research, and teaching efforts in this area. This will be accomplished in part by filling the two horticulture positions in Sheridan, one at the Sheridan Research and Extension Center and the other jointly with Sheridan College. Development of the 3+1 horticulture program with Sheridan College will improve student numbers and help emphasize the importance of these non-traditional crops in Wyoming. Organic production will be part of all phases of effort (research, teaching, and extension) as this area of agriculture continues to grow and develop. A biotechnology course that covers a broad range of agronomic and specialty crops will be instituted. Extension efforts will be revised to support specialty crop production and increase the viability and visibility of such crops in Wyoming.

### **Implementation**

Plant Sciences is experiencing a generational turnover in its faculty and reasonably expects to fill a relatively large number of positions over the next three years. These include an invasive weed scientist, an agronomy/irrigation scientist at Powell, two horticulture positions at Sheridan, two agroecology positions, two plant protection positions, and a functional genomics position focused on drought responses of plants. Plant Sciences will also explore the possibility of faculty from other departments joining our department, especially those with expertise in entomology. For this reason, the Plant Sciences academic plan is not a request for new resources (other than the usual start-up packages for new faculty), rather it is an outline for using existing resources to build a dynamic new department focused on creating the agriculture of the future.

The new hires described above and an improved staffing structure will serve to implement all action items in the Plant Sciences plan. Increasing graduate and undergraduate enrollment in Agroecology will result from the stronger program offered by a larger and more diverse faculty and by their individual recruiting efforts. Discussion of an extension-oriented non-thesis MS with extra business training will begin by Fall semester 2011. Renaming and revising the agronomy graduate program will begin immediately. The two horticulture hires at Sheridan will strengthen Plant Sciences in specialty crops and allow implementation of the third year horticulture program at Sheridan College. The first class in this program will be offered in the Fall of 2009 and the full program will be in effect by 2012. Addition of two plant protection faculty and possibly entomology faculty to Plant Sciences by 2012 will dramatically improve departmental strength in plant protection and related areas. Hiring an agronomy/irrigation scientist at Powell by Fall 2009 will rebuild strength in crop production and irrigation technology. Greater strength in agricultural biotechnology will be achieved by new faculty positions in plant pathology and functional plant genomics of drought responses, but perhaps also by transfer of plant biologists from other UW departments to Plant Sciences. The current turnover of faculty in Plant Sciences presents a challenge but also an opportunity. By hiring well and executing the action items of this plan, an essential UW department can be remade in the modern context and continue to fulfill its unique mission.