

## Plant Biology

An interdisciplinary graduate program offering the M.A., M.S. and Ph.D. in Plant Biology.

### ■ The Review Process

This was a standard AQAD review. Because of the strong interest on the campus in issues spanning the life sciences, the Deans of Natural Sciences and Mathematics, Food and Natural Resources, and Social and Behavioral Sciences agreed to conduct simultaneous AQAD reviews of the Departments of Biology and Biochemistry and Molecular Biology and the interdisciplinary graduate programs in Molecular and Cellular Biology (MCB), Neuroscience and Behavior (NSB), Organismic and Evolutionary Biology (OEB), and Plant Biology (PB). The design of the review process encouraged interaction among the six units in preparing for the team visits, and sharing of key information as the process unfolded. Reviewers:

Daniel Cosgrove (Pennsylvania State University)

Alan Gotlieb (University of Vermont)

Sagar Krupa (University of Minnesota)

### ■ Executive Summary

The review team noted that the Plant Biology program is only two years old, and that its AQAD assessment had been scheduled while the program is still “in its infancy” in order to align it with the other interdisciplinary life sciences programs. Nonetheless, the team felt that the review had provided an opportunity for useful comments and suggestions for future development. The team noted that the program had attracted a “diverse group of biologists,” and that “the potential for collaboration across disciplinary lines is great.” The team indicated that it saw “the beginnings of this in the successful proposal for plant growth chamber facilities.” The team was impressed with the seminar and colloquium programs, which it found to be of “excellent scientific caliber.” The team made a number of comments and recommendations regarding the graduate curriculum and student training, and also provided a set of summary recommendations relating to the program as a whole.

1. *Curriculum and Student Training.* The team reported that graduate students were “highly complimentary and excited about” the program, and felt they were obtaining a “high quality experience.” Their work in faculty laboratories was described as “very positive.” Some concerns and opportunities for improvement were noted:
  - The team reported that students felt they were “talking mostly to those in their own labs,” and lacked interaction with others in the program. The team suggested that this

might be addressed through a common office area in which students could be housed until selecting and moving into a faculty lab.

- Similarly, the team found a need for more informal interaction among students, in part because of heavy teaching loads. Reduced teaching assignments and student-initiated activities were suggested as remedies.
- It was reported that students sometimes found it difficult to find course recommendations (for example, selecting an appropriate statistics course), and in general expressed a desire for more diversity of courses.
- The team found seminars to be weighted toward developmental and molecular biology, and needing balance with respect to other areas (e.g., ecology).
- The team found “a general complaint that there is too much teaching responsibility,” and that this hinders students’ progress in research. It was recommended that the program and the administration “find ways to support students, other than by teaching assistantships year-after-year.” In addition, the team suggested that students be assisted in identifying grants which might be available for student support.

2. *General Observations and Recommendations.* The team had several observations related to program focus and faculty participation. First, the team found that the program has “too broad a focus and does not identify for the outside world the real and valuable areas of expertise within.” The team suggested that the program sharpen its focus in such areas as plant development at the cellular and molecular levels, stress biology, and plant ecology, and target student recruitment and research in those areas. On the other hand, it was also suggested that the University “find mechanisms for helping to better integrate the faculty and to stimulate collaboration” (for example, by providing seed monies for collaborative research efforts). The issue of the program’s focus and identity also emerged in the team’s observation that many of the faculty listed as participating in the program are not actively engaged with it. It was suggested that some minimal criteria be established for continued program membership.

The team raised the issue of faculty hiring, noting that faculty desire “a stronger voice ... in developing new positions within departments” contributing to the Plant Biology program. It was recommended that some “mechanism be developed for integrating the needs of this fledgling program with departmental hires.”

Several recommendations involved support for and utilization of graduate students. The team urged that, given the general scarcity of support dollars, assistantships should be restricted to Ph.D. students, and that support of students beyond the first year should be the responsibility of the major advisor. However, the team also recommended that faculty be permitted to “target qualified students” directly into their research programs, thus bypassing the typical first-year TA appointment. The team also suggested that faculty might improve the graduate student funding situation by seeking more training grants.

The team's final comment focused on funding, noting that "a continuing operating budget has been a problem" for the program. The team called for a "significant commitment" from the administration of at least \$30,000 per year for programmatic needs.

**Action Plan.** The Plant Biology program made specific responses to the visiting team's principal recommendations:

- While the program indicated that it shared the goal of building cohesion among students, it found that "providing common office space is impractical." Instead, the program indicated plans to encourage a graduate student organization, involve students in inviting seminar speakers, and encourage social activities.
- In response to the team's recommendation that teaching obligations be reduced, the program noted that "teaching assignments and workloads ... are determined by departments," not the program. The program is considering a policy that students would be supported as TAs for only one year.
- With respect to the imbalance among program foci reflected in the seminar series, it was reported that the upcoming fall seminar series will focus on Plant Ecology, which should provide balance.
- The team's observation that the program has too broad a focus was deemed an "excellent point," and the response indicated that working groups in the areas of Cell and Molecular Biology, Ecology, and Stress Biology have either been formed or are under consideration. These working groups will pursue training grants and assist in student recruiting.
- The program did not agree with the team's recommendation that minimum criteria be established for continued affiliation with the program. The program argued that it is deliberately "inclusive," and that "existing criteria for membership are adequate."
- The idea of seeking seed monies for collaborative faculty research was seen as "very helpful," and the program indicated that it will seek additional Hatch funds from the College of Food and Natural Resources for that purpose.
- With respect to the program's ability to influence faculty hiring decisions, it was noted that Plant Biology participates in the Life Sciences Steering Committee (which develops a comprehensive list of faculty hiring priorities). The program will continue this work, and also engage in direct discussions with departments.
- The program generally agreed with the recommendation that teaching assistantships should be focused on Ph.D. students, but also indicated that M.S. students "will still play a role in research in areas such as stress biology and plant ecology."
- The idea of "targeting" students directly into faculty labs was endorsed, but it was also felt to be important that "all students ... remain under the purview of the admissions committee and Program Director."
- The program agreed with the recommendation that it should receive at least \$30,000 per year in operating funds, noting that "favorable response to this recommendation by the administration is critical."

- The program agreed that it should evaluate the curriculum with the goal of focusing on impact within areas of specialization.
- With respect to the program's influence on faculty evaluations and faculty hiring decisions, the program noted that the existing Annual Faculty Report provides the opportunity for interdisciplinary program directors to comment on and recognize faculty contributions.

### ■ **Student Outcomes Assessment**

Most of the focus on student outcomes assessment reflected in the AQAD procedures (and the literature as a whole) refers to undergraduate instruction. No special issues related to outcomes assessment emerged from this review, although the semesterly assessment of student research (described in the self-study) seems to provide a framework within which appropriate learning outcomes could be developed.