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Curricular Report No. 1984-85-6 from the Graduate Council to the Faculty Senate: Proposal for a Plant Science Option to the Ph.D. in Biological Sciences

University of Rhode Island Faculty Senate

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UNIVERSITY OF RHODE ISLAND
Kingston, Rhode Island

FACULTY SENATE
BILL

Adopted by the Faculty Senate

TO: President Edward D. Eddy

FROM: Chairperson of the Faculty Senate

1. The attached BILL, titled Curricular Report No. 1984-85-6 from the Graduate Council to the Faculty Senate: Proposal for a Plant Science Option to the Ph.D. in Biological Sciences, is forwarded for your consideration.
2. The original and two copies for your use are included.
3. This BILL was adopted by vote of the Faculty Senate on February 14, 1985 (date).
4. After considering this bill, will you please indicate your approval or disapproval. Return the original or forward it to the Board of Governors, completing the appropriate endorsement below.
5. In accordance with Section 10, paragraph 4 of the Senate's By-Laws, this bill will become effective on March 7, 1985 (date), three weeks after Senate approval, unless: (1) specific dates for implementation are written into the bill; (2) you return it disapproved; (3) you forward it to the Board of Governors for their approval; or (4) the University Faculty petitions for a referendum. If the bill is forwarded to the Board of Governors, it will not become effective until approved by the Board.

February 15, 1985
(date)

Frank M. White
Frank M. White
Chairperson of the Faculty Senate

ENDORSEMENT

TO: Chairperson of the Faculty Senate

FROM: President of the University

Returned.

- a. Approved _____.
- b. Approved subject to final approval by Board of Governors _____.
- c. Disapproved _____.

2/21/85
(date)

Edward D. Eddy
President

At its Meeting No. 236 on September 21, 1984, the Graduate Council unanimously approved the addition of a Plant Sciences option to the Ph.D. in Biological Sciences. The new option would include three academic specializations: Agronomy; Horticulture; and Plant Physiology and Molecular Biology of Plants. For the past 20 years, doctoral candidates in these areas have been permitted to enroll in the Botany option of the Ph.D. in Biological Sciences and, through the cooperation of the Botany Department, qualified faculty in Plant Sciences have been appointed as major professors for these students. Thus, the creation of a new option really represents the division of an existing program into two ongoing entities, the resources for which are already in existence. This is made clear in the full proposal itself and in the memorandum to the Faculty Senate dated November 20, 1984 from Mr. J. Vernon Wyman, Assistant to the Vice President for Business and Finance, which concludes:

It is apparent from this proposal that the establishment of this doctoral program in Plant Science will demand little if any additional financial resources from the University. The potential cited for additional tuition and fee revenues and possible increases in the department's ability to support externally funded research would be welcome.

Based on Mr. Wyman's report, the Faculty Senate Executive Committee has concluded that the proposed option does not require review and ranking by the New Program Review Committee because it meets the criteria for exemption set forth in Section 8.85.20 of the University Manual: "...if the program can be entirely supported by reprogramming existing departmental funds, or if the amount of general revenue funds required per year does not exceed the current calendar year minimum salary of an instructor, no review under 8.85.20 shall be required."

The Graduate Council therefore forwards the proposal for a Plant Science option within the Ph.D. in Biological Sciences to the Faculty Senate with a request for approval.

RATIONALE

(Adapted from the full-length Proposal)

1. Program objectives and background: The doctoral option in Plant Science will prepare researchers and educators for expanding fields of applied plant science: growth regulation, stress physiology, genetic engineering and biological efficiency. It will also provide academic focus for the plant science research efforts of the R.I. Agricultural Experimental Station (RIAES), improving the opportunity to recruit faculty and to increase external funding.

Although the awarding of doctoral degrees under the sponsorship of the Botany Department has been successful, Plant Science faculty have been required to follow the rules established by the Botany faculty relative to qualifying and comprehensive examinations, committee composition and seminar participation. Sometimes this has been at variance with the professional interests of the students involved. There is little incentive for the Plant Science faculty to develop advanced courses when they participate only marginally in the programs using those courses. All botanical science programs at U.R.I. will be furthered by identifying this new and separate option, which has the endorsement of the Botany and Plant Pathology-Entomology Departments.

Other considerations include the encouragement of the nationally and internationally recognized research programs in turfgrass science and ornamental plant propagation centered in the Plant Science department by expanding the number of dissertations being pursued. A doctoral option in Plant Science will also help in obtaining grant support for research by enhancing the credibility of the department, especially with granting agencies which sponsor basic research and by making them eligible for funding that is restricted to Ph.D. programs.

2. Need for a Plant Science Doctoral Option: Recent developments in biotechnology have stimulated renewed activity in applied Plant Science research. The practical application of cell and tissue culture techniques to a broad spectrum of plant species together with the discovery of bacterial vectors for gene transfer have provided the possibility for hitherto unimagined genetic alterations in the productivity and utility of food and ornamental plants. The virtual explosion in the research activities of corporate and public organizations has created a critical demand for persons educated in this new biotechnology.

At U.R.I., the graduate programs in plant or botanical sciences are somewhat dispersed among the colleges of Arts and Sciences, Pharmacy, Oceanography and Resource Development. This proposed doctoral option in Plant Science, although of modest size, may contribute to a common professional focus for many plant-related disciplines and ultimately could become the catalyst for a broad-based doctoral program in plant biotechnology.

3. Professional Opportunities: The demand for Ph.D.'s in the applied plant sciences continues to be good. Graduates in turfgrass science, plant propagation, and plant physiology involving plant cell/tissue culture techniques, stress physiology, or genetic engineering have had little difficulty finding initial positions. In general, the employment prospects appear encouraging for the remainder of this century, especially if the graduate is willing to relocate to obtain that first professional position.

4. Source of Students: Because each land grant university has a plant science graduate program, our students are most likely to come from Rhode Island and the Northeast, although our national reputation in turfgrass ecology, physiology and management and in woody ornamental plant propagation and culture has attracted students from more distant states. A Ph.D. option will likely increase the pool, numerically and geographically, thus ensuring the quality of the students.

5. Program Size: Limitations in faculty, financial support, and laboratory facilities will keep the numbers down. Within one complete program cycle (3-4 years) there will probably be no more than 6 or 7 candidates. But a sharp increase in external funding for research could lead to a doubling of this estimate. Normally, most students are expected to be full-time, but an increase in private sector activity could increase the number of part-time students. As the present graduate student population in Plant Science is well below capacity (approximately one student per faculty member), some program expansion can be accommodated with no increase in staff.

6. Admission Requirements. An M.S. in an agricultural or biological science discipline; a grade point average of not less than 3.0 and a combined GRE score of at least 1000. Applicants without an M.S. will be considered, but, if admitted, must pass an oral qualifying examination after having completed 18-24 credits of graduate work. Applicants with an M.S. must take a diagnostic examination during their first semester; those whose M.S. is from U.R.I. may be exempted from this depending on previous preparation.

7. Program Requirements: As required by the Graduate Faculty, the proposed Plant Science option will require a minimum of 72 credits beyond the bachelor's degree, of which up to 30 may be waived for those holding an appropriate master's degree. While there are no specific core course requirements, students will be expected to develop an integrated program of study which will correct deficiencies, complement research efforts, and prepare them to pass the comprehensive examinations. These exams (both written and oral) will test Ph.D. candidates in one major and two minor areas chosen from: agronomy, horticulture, soil science, crop ecology, plant biochemistry, crop physiology, cell biology, anatomy/morphology, taxonomy/systematics and genetics. (One of the first three areas must be included.) Students must also demonstrate sufficient general knowledge to teach an introductory Plant Science course, e.g., PLS 204, and competence in one research tool, selected from among experimental statistics, computer science, electron microscopy and analytical chemistry. The substitution of a foreign language or the requirement of an additional research tool may be specified by the student's program committee, which will consist of at least four faculty members, chosen and appointed in accordance with Graduate School regulations. Dissertation research will be encouraged in those areas where ongoing research programs are well-established in the department and in cooperation with faculty in Natural Resources Science, Botany and Plant Pathology.

8. Interinstitutional Considerations: The five other New England Land Grant Universities all offer the Ph.D. degree in Plant Science or Plant and Soil Science. Our proposed program is distinguished by the strong emphasis on turfgrasses and grasslands, including tidal salt marshes. Connecticut and Vermont have programs in woody ornamentals, but U.R.I. is distinguished by our efforts in propagation. Several schools list physiology, but we are unique in our work on allelopathy, salt and heat tolerance, and the energy relations of stress responses. We are also developing a unique capability in non-conventional gene transfer research and we lead in releasing new turfgrass varieties. In general, the proposed doctoral option will complement those of other schools but not duplicate them. Letters of endorsement have been received from the chairpersons of our counterpart departments at the Universities of Connecticut, Massachusetts and Maine. Potential exists for students from other New England states to attend U.R.I. under the Regional Student Program where their department chairpersons and graduate deans certify that the particular specialization is not available at the home state University.

9. Resources. The Ph.D. option in Plant Science will be administered by the graduate faculty of the Plant Science department under the policies of the Graduate School. Nine of the present 12 graduate faculty members of the department will assume prime responsibility for the doctoral program under the leadership of the department chairperson. Because these Plant Science faculty efforts have been underway for so long under the Botany option, and because their research is implanted in the Agricultural Experiment Station, there will be little if any additional cost. Nor will the doctoral option divert resources from the undergraduate programs, which should actually be enhanced by its presence. No new support personnel positions are anticipated for the Ph.D. option. The library resources have been evaluated and found adequate for the program, although some new journals could be added to the serials list. Two well-equipped plant physiology laboratories exist in Woodward Hall and the Resource Development Greenhouses, with over 8000 sq.ft. of research space. Excellent field plot facilities are available, including over 15 acres for turf under irrigation, over 13 acres in field plots for field, forage and vegetable crops, and a 40-acre ornamental and small fruit research farm, all of which represent the principal centers of the R.I. Agricultural Experiment Station. The operating costs for the Ph.D. option are already included in projects supported by the R.I.A.E.S. External funding may actually increase once the option is approved, as may opportunities to support research assistants. In recent years, from 8 to 10 graduate assistants

have been supported for twelve-month periods.

10. New courses. Several new course proposals are in the development stage, but only one is essential to activate the option:

PLS 699 Doctoral Dissertation Research (I and II) Number of credits is determined each semester in consultation with major professor or program committee. S/U credit.