To: Fred Hartmeister, Dean of the Graduate School

From: Paul Paré, Associate Professor of Chemistry and Biochemistry
       Michael San Francisco, Professor of Biological Sciences
       Mark Webb, Associate Professor and Chair of Philosophy

Date: April 1, 2010

Re: Plant and Soil Sciences Department Graduate Program Review

As requested by the Graduate School, a committee of Paré, San Francisco, Webb, and outside reviewer Mark Lagrimini (Plant and Soil Sciences Department Chair, University of Nebraska, Lincoln) conducted a review of the graduate program in the Department of Plant and Soil Sciences. This review involved an individual study by each committee member of the self-study document provided by the department and 3 hours of joint committee discussions. In addition, the review panel met with several departmental representatives during a day-long onsite review conducted on 24 March 2010; meeting were held with the Department chair and acting graduate advisor, faculty, graduate students, and supervisors for the campus greenhouse facilities, the Lubbock research farm, and the Fiber and Biopolymer Research Institute.

Program Overview and Vision

The department has an interdisciplinary program covering Biotechnology/Genomics, Crop Science, Entomology, Fiber and Biopolymer Science, Horticulture and Soil Science with B.S. degrees in Environmental Crop and Soil Sciences and Horticultural and Turf Grass Sciences, M.S. degrees in Crop Science, Entomology, Horticulture, and Soil Science, a Ph.D. degree in Plant and Soil Science, and four graduate certificate programs. The departmental vision is to be recognized as one of the top departments of its kind in the nation. The department includes 27 faculty members that represent 18 FTEs; many of the faculty have joint appointments with agencies of the Texas A&M system including Texas AgriLife Research and Texas AgriLife Extension. The department currently has 120 students in its undergraduate program, 60 M.S. students, and 35 Ph.D. students. The current chair of the department, Dr. Thomas Thompson, has served in this capacity since 2006. The diverse faculty in the department represents five emphasis areas: Crop Protection, Crop Sciences, Fibers and Biopolymers, Horticulture, and Soil Science. The self-study document shows that student enrollment has increased slightly over 50% during the last five years and that this growth can be attributed almost exclusively to greater numbers in the Ph.D. program.
Faculty Productivity

The department has brought in an average of 2.8 million dollars in external funding over the past five years from approximately 36 awards per year. This represents a substantial increase over the funding reported in the previous self-study (1.7 million). This research effort has resulted in an average of 33 refereed publications annually including book chapters over the last 3 years. Although the average number of publications on a FTE basis is reasonable, considering that there are 27 faculty currently in the department and just short of 100 graduate students, this number does not seem to be keeping pace with the growth in external funding. In most fields of science, high impact publications serve as a strong driver to provide continued research funding as well as a powerful draw for the best of the graduate applicant pool. Linking an internationally accepted ranking such as the h-index that reflects both the number of publications and the number of citations per publication with faculty evaluations could provide a greater incentive for generating and publishing high-impact research. At the full professor level, the departmental h-index average is 11.6 while at major research universities for scientists, a value of 18 is more in line with a full professorship. The five year average faculty workload is 15.7, which is above the university average of 14.2; although Student Credit Hours generated per FTE for the department has fallen from 339 to 169 since 2003.

The majority of the faculty expressed concern that they were not integrated into the process during preparation of the material for the Graduate Program Review. Indeed, the meeting of the review committee with the faculty was their first exposure to the document. The faculty survey with 10 respondents (37% response rate) indicates that the faculty are generally supportive of the department. The survey document was predominantly weighted towards graduate teaching and communication issues but no questions were directed to the research mission.

Graduate Students and Graduates: Quality and Quantity

The graduate students in the department are generally enthusiastic and satisfied with the status quo. The student survey for all categories out of a maximum of 5 averaged 3.95. Over 20 students attended the meeting with the review committee and most had something positive to say about the department and their mentors. The Strategic Plan of the department identifies a goal of 85 graduate students by 2013. The current enrollment of 90 graduate students shows that this goal has already been met. There has been a moderate increase in the number of graduate student applicants and number of students admitted (total and as a percentage of the applicant pool) over all disciplines over the past 6 years. There has been a drop, however in the GRE scores (V & Q) since 2007 in every discipline in the Department. There has also been a continuous downwards slide in the GPAs of new students overall. These data taken together with the strategic goal of increasing numbers should be cautionary. In meeting with the faculty, decisive criticism was raise against the Graduate School with accounts of misplaced student applications, paperwork for oral exams and intent to graduate forms.

Graduate student involvement in scientific publications is relatively low. One comment from the faculty was that this may be due to the nature cropping seasons and student graduation timing.
While this may be true, we feel that it is in the best interest of the students and faculty that projects be appropriately designed to facilitate student publications in refereed outlets.

Curricula Issues

The graduate students have identified two important issues related to the curriculum. The two lowest rated categories were “availability of classes” 3.0 and “graduate seminar” 2.52. The availability of classes may be addressed by cross-listing courses with other departments, increasing faculty numbers. The student survey also noted that some course offerings in alternate years negatively impact their choices. A proposal under consideration to develop a MS Program in Plant Protection that would incorporate the entomology courses (the MS in Entomology with limited faculty numbers has been designated low producing) may also address the problem of class availability. Reduction of courses that are “piggybacked” (co-taught graduate and undergraduate courses) may also alleviate this problem. Interestingly, this very issue was identified in the previous Graduate Program Review. Therefore, this must be addressed with expediency by the Department and College. The virtual absence of a functional Graduate Seminar currently was a source of dismay for many. Several of the seminars are cancelled and many are presented by the students. We recommend that the faculty at large take a more active role in the seminar series. Perhaps a faculty and student committee can work together to invite scientists from across the nation and university. This activity will engender more student/faculty interaction and provide graduate and undergraduate students a mechanism for networking for the future.

One of the strategies to meet goals of the department is to enhance activities and support for the Distance Education Program. It may be useful for the department leadership to note comments of students in this program indicating that they still do not know who their advisor is and have received no advising. In fact, insufficient advising also appears to be occurring for in-house graduate students, with several accounts during our meeting with graduate students of upper class students being the only source of course advising for more junior students in the program.

Facilities and Resources

As was identified in the Program Review 6 years ago, the facilities for the department remain inadequate. The bulk of the TTU faculty are housed in 5 buildings on the campus. This contributes to a lack of cohesiveness and one obvious impact is the Graduate Seminar. The number of Teaching Assistantships offered to the department is currently one and has fallen from a high of five in 2004. The low number of these assistantships may have a negative impact on graduate student utilization in laboratory sections. Many of the graduate students on Research Assistantships are recruited to participate in teaching laboratory sections as well and this may negatively impact their research productivity and time to graduate.

The department operating cost has remained fairly flat since 2003 at $215,071. With the increase in faculty from 23 to 27 during this period, the cost per faculty member has actually fallen to $7,869. It is ironic that with stagnant support from the university, growth in student
numbers, faculty productivity in teaching and service is mandated to increase. The department still laments the lack of appropriate teaching laboratory facilities. The requirement for fume hoods in certain procedures is mandatory and not an optional one. We therefore urge the college to address this matter with expediency.

Some students have noted that paperwork processing in the PSS office is very slow and has often resulted in late payments. Perhaps a review of the staff and their ability to work with the new BANNER system may be in the best interest of the department.

A new building for the department will unify most of the faculty and activity towards realizing this goal is underway. Some of the faculty expressed concerns, however, that the building plans may not be adequate for future growth.

Summary

The Department is to be commended on increases in external funding and number of graduate students over the past six years. Further improvements in graduate education may be gained by tweaking several aspects of the program including: [i] establish a graduate seminar series that brings in internal as well as external researcher, [ii] improve graduate advising with regard to course recommendations, [iii] incentivize faculty to generate high impact publications and seek competitive federal funding, and [iv] strive to improve the competitiveness of entering graduate students based on GRE scores, GPAs and number of external applicants. A relatively small increase in departmental funding for departmental seminars and enhanced graduate advising is recommended and should immediately improve graduate education. It is also recommended that excellence in funding and publications be emphasized at the department level as a heavily weighted component for all tenure and promotion decisions; other words, the securing of federal funding concomitant with generation of high-impact publications is necessary and sufficient to secure career advancement for faculty. The construction of a centrally located campus facility for faculty and graduate students to teach and perform research is a costly albeit worthwhile and necessary project for the Department and University to pursue.

Overall rating: GOOD