

Assessment of Provisional Programs (Appendix D)

Bachelor of Science in Tropical Plant and Soil Sciences

College of Tropical Agriculture & Human Resources

University of Hawai‘i at Mānoa

Campus Review Process

The faculty review team was comprised of Judith Kellogg (convener) of English, Garrett Ito of Geology and Geophysics, and Phillip Ooi of Civil and Environmental Engineering. The team read the January 2006 self-study of Tropical Plant and Soil Sciences (TPSS), the 1997 program reviews for Horticulture and Agronomy, and Soil Sciences Departments (combined into TPSS), vitae of all faculty, and catalogue material. The team administered a student questionnaire and held meetings with students, faculty members, the department chair, program chairs, the Associate Dean and the Dean of the College. Finally, they toured most of the campus labs and research facilities, the campus glass houses, and the Magoon site in Mānoa Valley.

1) Is the program organized to meet its objectives?

The program is organized to meet its objectives, and is proactive in addressing concerns and issues identified through the review process.

The Department of Tropical Plant and Soil Sciences (TPSS) is a research, education, and outreach unit for tropical agriculture and landscape plant science and production, food safety, and soil science. TPSS was formed in 2000 by combining the departments of Horticulture and Agronomy, and Soil Science.

TPSS offers the Bachelor of Science, Undergraduate Certificate in Agribusiness Management, Master of Science, and the Doctor of Philosophy degrees. During the 2005-2006 academic year, there were 40 declared majors, and three students graduated with bachelors degrees in spring 2006. Undergraduates select from three options. The Plant Sciences and Genetics option prepares students for careers in research. The Production and Management option “involves the study of Hawai‘i’s unique soils, insects and diseases that affect plants in the tropical environment, and familiarizes students with business skills in management, personnel administration, marketing and accounting. The Environmental Soil Sciences option involves the study of natural land and soil resources and their effective management. The Production and Management option is the most popular, however the chair and faculty members would like to increase enrollment in Sciences and Genetics to prepare students for graduate work. The chair and Dean would like to see an overall increase in undergraduate enrollment and to improve the caliber of students.

A total of 27 undergraduate and 19 post-graduate students responded to the student questionnaire. The quality of teaching received mixed reviews, but students expressed confidence in faculty expertise and high regard for their research. Students were especially positive about the guest lecturers from industry and the field trips. In the written responses, several commented specifically on the value of the “hands on” experience. While the undergraduates were enthusiastic about agriculture, the most consistent complaints involve the length of time to graduate due to inability to get courses in a timely manner, and a foundations course (TPSS 300) that was viewed as particularly disjointed.

The department offers some required courses only once every two years, and if a student misses a cycle early in the program, graduation is delayed. In response, the undergraduate chair designed a sequence that, if cycled into as soon as a student enters the program, will ensure graduation in four years. Several problems exist with the sequence. 1) Students fail to follow the

sequence because they do not seek advising. 2) There are often scheduling conflicts between required courses (inside and outside of TPSS), and class cancellation due to low enrollment. 3) The sequence does not accommodate transfer students or students who declare majors after the first year. The department has been unsuccessful at enforcing mandatory advising. In response to these findings, the department has developed and posted a four-year schedule of courses on its departmental website.

Students also complained about the foundations courses, particularly TPSS 300, in which multiple instructors introduce their areas of expertise. Students said that the course could be better coordinated. The department does not require course evaluations. In response to team findings the department has begun regular assessments of TPSS 300, and has identified a number of possibilities, including redesigning it as a laboratory course for TPSS 200.

Students were genuinely enthusiastic about agriculture as a field. They appreciated the special opportunities afforded by fieldwork, internships and teamwork, and felt that they would find good jobs at graduation. They wished, however, for more specific career counseling. Many undergraduates have been attracted from the mainland, with high expectations, and their experience in the program may have an impact on future recruiting. To attract UH students into TPSS, several majors suggested that an introductory (perhaps 200-level) horticulture course that fulfilled a general education requirement would provide a gateway to attract new students. In response to this feedback, the department has hired a student to work with advisors to revamp material and course information for the website.

2) Is the program meeting its learning objectives for students?

The program has identified learning outcomes and has engaged its faculty in building its assessment infrastructure.

The Department of TPSS recently assessed student competencies and skills in thirteen courses in relation to thirteen educational objectives. Eleven faculty members participated in the assessment wherein the faculty ranked how well the students achieved certain competencies and skills on a scale of 1 to 5, with 5 = exceeds expectations and 1 = poorly demonstrated. Faculty based their assessments on term papers, oral presentations, exams, lab reports, and class participation, and completed a rubric evaluating each student. The acceptable performance criteria was 3.0 and above. Written guidelines were provided to the faculty to assure uniformity in standards for assessing. Despite the guidelines, the team found what appeared to be a lack of uniformity on the part of the faculty in utilizing the assessment standards, and while establishing a baseline, there appeared to be a disconnect between the assessment results and the department's plans for improving the program.

The Council on Program Reviews and the OVCAA have encouraged the department to build upon its efforts and to take assessment to the next level. The OVCAA will continue to monitor the department's assessment efforts through the annual assessment reports and workshops for faculty. The council further recommends that the department work to increase faculty buy-in to assessment, and to develop an effective assessment timetable. Further, the unit is encouraged to further develop assessment strategies, and implement changes to the curricula based on assessment results. Finally, the team urged the unit to also solicit regular alumni feedback and to assess the needs of employers. The unit responded favorably to these recommendations.

3) Are program resources adequate?

The unit has resources to manage the program, however the Council urges further discussion with the dean to increase instructional FTE. The TPSS personnel include 39 faculty and 28 staff members. Faculty positions are distributed among 18 researchers, 13 extension agents, and 8

specialists. Many have joint specialist/ researcher appointments. There are no 100% “I” positions in the department, and all of the instruction is provided with only 3.67 Total *instructional* FTE of which 2.25 FTE is associated with the undergraduate program and 1.42 FTE associated with the graduate program. Researchers and Specialists are responsible for the majority of course instruction. There is consensus among faculty that the instructional FTE allocation is too low and should increase relative to the “R” and “S” allocations to better match the teaching requirements of the programs.

Of the 24 researchers and specialists, four were hired in the last four years, 14 have been with the department for 14-29 years, and seven for 30-47 years. Recent and projected retirements make hiring a priority for the department.

In response to these findings, the department chair held meetings with the dean to discuss the definitions of workload distribution within the different faculty categories (I, R, E) in the College. In particular, the college’s policy of 50% Extension within Specialist positions is causing difficulty in flexibly adjusting FTE time distribution to meet actual faculty workload.

TPSS has an array of facilities for their research projects. The Pope Laboratory facilities are 30 years old and on the list for renovations. The growth chambers were scheduled to be replaced in 2007. While the Magoon facility supports faculty research and essentially every student in the program receives hands-on experience there, the facility is in critical need of repair. Bids have been received and renovations should begin in 2007. The facilities in Waimanalo or Poamoho are also reportedly in need of major renovation as well. Students reported that adequate transportation to research sites is also problematic as the department vehicles are old. The department has since purchased new growth chambers are being purchased, and they have received \$500K for new replacement equipment. A contract has also been signed for \$4.1M for the Magoon facility. Per the UH transportation policies, the vehicles were replaced in 2007.

TPSS obtains funding from various agencies and organizations including but not limited to the US Dept. of Agriculture, US Agency for International Development (USAID), National Resource Conservation Service, Hawai‘i Dept. of Agriculture, County of Hawai‘i, Hawai‘i Agriculture Research Center, Hawai‘i Island Economic Development Board, Oceanic Institute Center for Tropical and Subtropical Aquaculture, and American Farmland Trust Inc. During 2000-2005, TPSS obtained more than \$22 M in grants and contracts with a median individual faculty funding of \$88,500.

4) Is the program efficient?

The program is efficient. The academic program costs and revenues template and accompanying narrative are attached.

5) Evidence of program quality.

The research and service activities of TPSS are diverse. Expertise includes crop and landscape management; agribusiness management and marketing; soil, water, and nutrient management; application of biotechnology to tropical crops, genetic improvement, physiological and biochemical analysis of plants; and preparation of high quality and safe commodities for the market.

During the seven-year period of 1999-2005, the faculty published at an average rate of 1.9 peer-reviewed publications, book chapters, and books per year and an average of 3.9 non-peer reviewed publications, technical reports, and extension publication per year.

Fitting with the unique focus of TPSS, the department is well recognized internationally for tropical soils and plant sciences. A particular distinction is their work in tropical soils and the application for tropical fruit, vegetable, and ornamental production. Many of the TPSS faculty have been invited as guest speakers at various national and international meetings such as the Gordon Conferences, International Food Technology Workshops, International Symposium on Biotechnology, International Horticultural Congress, and International Papaya Symposium to name a few. Several faculty have received national awards in horticulture, agriculture, and fruit cultivation.

The department has interfaced with many agencies and aligned its program with the goals and vision of these agencies. The department has established educational programs within the community. The department's success with community relations is further evident by the number of scholarships established by local entities. The department's success extends beyond international waters. As the only college of tropical agriculture in the nation, the department deals with unique crops and soils not duplicated by other research centers in the country. This has led to cooperation between the department and others in Southeast Asia, Africa and elsewhere.

6) Are program outcomes compatible with the objectives?

According to the chair, the department would not need to cancel as many required classes if they could increase undergraduate enrollment. While the Production and Management option is the most popular among the undergraduates, the faculty expressed interest in increasing enrollment in the Sciences and Genetics option to prepare students for graduate work. The chair and the dean also expressed interest in increasing undergraduate enrollment overall, and improving the caliber of undergraduate and graduate students.

7) Are program objectives still appropriate functions of the college and university?

The program objectives are still appropriate to the functions of Mānoa, and implements Mānoa's strategic vision of "building on our strengths related to our natural environment and tradition of outstanding Asia/Pacific scholarship."

The mission of the department is to marshal its intellectual resources to serve the state and the Asia/Pacific region through teaching, research and outreach. The faculty is committed to meeting this challenge with programs directed toward improved plant production, food safety and marketing systems for enhanced economic opportunity in the state and the Asia/Pacific region.