EXTERNAL PANEL REVIEW

THE GRADUATE PROGRAM IN HORTICULTURE
OREGON STATE UNIVERSITY

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OVERALL RECOMMENDATION
Maintain and perfect/refine

SUMMARY OF FINDINGS AND RECOMMENDATIONS

INTRODUCTION
The external review committee organized its review and assessment by the evaluation criteria suggested by the Guidelines for the Review of Graduate Programs offered by the Graduate Council of Oregon State University. The Horticulture Program organized a detailed and comprehensive self-study document that allowed the committee to prepare for the review and explore questions in detail. Interviews with Associate Deans of the College of Agricultural Sciences, and graduate faculty and students in the Horticultural program all revealed uniform support for the program while recognizing resource limitations. The external review committee shares that support, although notes some limitations presented by current methods for organizing the program. Our recommendation, therefore, is for the program to maintain its direction while experimenting with new ways for supporting graduate education and students.

DETAILED FINDINGS

1. The fit of the mission of the program and its relationship to the mission of the academic college(s), and the university mission.
The link of this graduate program to the overall mission of the college and university are very clear. The three initiatives from the Provost advancing science of sustainable earth ecosystems, improving human health and wellness, and promoting economic growth and social progress are all included within the mission of this graduate program. Within the Department of Horticulture, there are 1.9 FTEs budgeted through E/G funds from the college, with an additional 7.1 FTEs through the experiment station. The program identifies almost 40 faculty as part of this graduate program. The committee concluded that the number of FTEs funded on E/G funds is low compared with teaching expectations. Additionally, given the size and scope of the horticulture industry within the state and the Pacific Northwest region, the overall number of FTEs also seems low (Figure 1 in the review document). Given the few number of faculty, they perform extremely well, increasing the number of graduate students and external funding for their programs to continue to support this important sector of the Oregon economy.

2. Quality of students and 3. admissions selectivity
As indicated in the Self Study for the Review of the Horticulture Program (pp. 7-13) the quality of students is generally high although there have been periods in the past when the average GPA dropped below 3.0. GRE scores seemed to be somewhat low, with average scores ranging from less than 1000 to slightly more than 1100. (The review committee did not have comparative data on GRE scores for other programs so cannot comment on whether these are representative of horticulture programs in general.) The fluctuating GPA and GRE scores may be due, at least in part, to the non-competitive admissions process that admits students only when funding is available through a faculty member’s grant. We heard from one student, for example, who “networked” into the program through personal contacts in the local community. Without a strong pool of students to select from, faculty who need assistance on research efforts may be taking students who are available rather than excellent. This
noncompetitive process also does not allow the program to systematically recruit and fund a diverse cohort of graduate students.

Recommendations:
  a. *Develop a recruiting effort that targets diverse populations* interested in horticulture. This may be done in conjunction with related programs (e.g., crop and soil science, botany and plant pathology). One idea used successfully in other programs is a “recruitment weekend,” that brings together a group of excellent candidates to learn more about the opportunities available at OSU. Resources at OSU can help identify low-income, first generation, and other non-representative student populations.
  b. *Pursue alternative methods for supporting students beyond external dollars*. These methods could include sharing GTA positions with other programs (e.g., Biology), Laurel Grants to fund tuition, Provost awards, e-campus revenue, etc. These supplementary funds can also be used as incentives for faculty who agree to provide service to the graduate program (e.g., teach horticulture classes). Also see discussion below about financial support.

4. **Level of financial support for students**

All Horticulture graduate students are funded, with most receiving support from faculty grants. There are currently two GTA positions being funded with e-campus revenue. Students expressed gratitude for the support. Providing support for all graduate students is a definite strength of this program although the source of funding (individual grants) appears to be somewhat problematic for the program as a whole (see comments above about strategic recruiting and diversity). Creating program-based funding sources (e.g., GTAs, Laurel Awards, Provost awards) can allow the Horticulture program to be more strategic in its recruiting and also be used to supplement and/or reward both students and faculty who contribute to the program.

Recommendation:
See recommendation b about developing additional sources of funding to supplement current practices

5. **Curriculum strength**

For both the MS and PhD degrees, graduates are expected to gain an in-depth knowledge in the discipline (Outcome 2, p. 23 and 24). Given that desired outcome, the committee was surprised that the discipline was not defined through a curriculum for either degree. Curriculum presently is dependent on course selection and scheduling across a number of departments representing numerous disciplines. Graduate students and faculty identified the lack of stand-alone courses within the discipline of horticulture as a weakness and the committee concurs.

The curriculum for this graduate program is flexible. Flexibility within the curriculum has advantages and disadvantages. However, consistency in disciplinary knowledge was expressed as a need by students and faculty as well as a desire for some increase in the structure of curriculum. To maintain flexibility while increasing structure, the committee suggests the
graduate faculty think about a course in analytical skills including statistics, research methods, or equivalent (e.g., handling large data sets and spreadsheets). Additionally, many students take basic science courses such as biochemistry and genetics. The faculty should develop a list of expected learning outcomes for these types of courses so students understand the context of these within the discipline of horticulture.

One of the requirements for the program is a seminar. The committee recommends the faculty require presentation skills to be developed as part of the course. Presently students work with their faculty advisor for the seminar. There are models where students work closely with a different faculty member to increase student-faculty interactions and expose graduate students to different approaches to science.

Recommendations:
c. Offer courses in innovative ways or in different formats to take advantage of the expertise within the graduate horticulture faculty on and off campus.
d. Pursue cross listing courses and/or team teaching critical courses to meet the disciplinary needs of students in horticulture.

6. Quality of personnel and adequacy to achieve mission and goals
The Department of Horticulture has seen a 46% reduction in the number of faculty which translates to a 37% reduction in FTEs. A strength of the program is the linkage between the graduate program in horticulture with USDA researchers located in Corvallis thus effectively increasing the number of faculty associated with the graduate program to almost 40. The quality of the faculty is excellent. Graduate advising is very strong.

However, because of the federal rules governing USDA researchers, they are not able to be the primary instructor for courses. Thus the number of advisors is certainly adequate for advising, the number of faculty who teach is much smaller.

Recommendation
See recommendation c above

7. Level and quality of infrastructure
Both faculty and students expressed general satisfaction with existing infrastructure (e.g., labs, greenhouses, farms and field sites, computer facilities, office space). Some of the greenhouses are old and unlikely to be repaired due to Historic District rules that govern the OSU campus. While there appears to be generally good connection with the facilities (and faculty and staff) at the North Willamette research station, there was some discussion about the lack of housing facilities at other locations, which limits use/interest by students.

Recommendation:
e. Explore possibility of creating housing opportunities at statewide facilities to encourage wider use by Corvallis-based students and faculty. This could be done in conjunction with other programs and units.

8. Quality of organizational support
Both students and faculty expressed strong support and gratitude about the organizational and administrative support provided by the Horticulture program. IT support and administrative support both received high marks. Both students and faculty reported that Anita Azarenko, Head of the Horticulture program, is a strong and effective advocate for the program and is extremely responsive to problems and needs that arise. The grad program director, John Lambrinos, was also recognized as a strong steward of the program as well as a good mentor to all students with problems and concerns.

Students reported that faculty mentoring was inconsistent; some described a strong relationship with their major advisors while others reported a more hands-off style. Both approaches had champions and detractors. Another issue raised by students was the lack of a general orientation (although there is a record of providing this service to students). Students reported that the Student Handbook was out of date.

Recommendations:

f. Consider a new way of delivering and/or marketing orientation services to students. This may be especially important as students begin the program during different terms.

g. Provide professional development regarding mentoring relationships for both faculty and students. The handbook already contains a great example of responsibilities of both parties, and additional information can be provided in seminars, checklists, and trainings.

9. Level and quality of student performance

As indicated in the Self Study for the Review of the Horticulture Program (pp. 51-52), the vast majority of students who have entered the program finished with their intended degree. It is reported that only 9% of students admitted over the review period withdrew from the graduate program. Although data for comparable MS programs were not readily available, it is reported in the U.S. graduate programs in the Agricultural Sciences in 2009 report (National Science Foundation 2010) that the time to degree is significantly below the median of 8.0 years.

Graduate student outputs in the number of publications and presentations are impressive. It was reported that on average the publication rate was 1.5 publications per student in the program since 2006. Graduate students were sole or coauthors on 207 publications and 39 presentations since 2006. Overall, the review committee thought the level of student performance was strong.

Recommendations:

h. Although student performance overall is good, additional consideration regarding the recruitment of excellent performing students would no doubt increase the level and quality of student performance within the graduate program (see recommendations a and b above).

10. Level and quality of faculty performance

The review committee was impressed overall with the level of faculty performance for the program given the increased workloads due to budget constraints, faculty retirement and a
relatively small amount of FTEs devoted to graduate education. Faculty members generated grants and contracts that totaled more than 18.2 million dollars between fiscal years 2007-2010. These grants and contracts significantly support the graduate program. Graduate students mentioned that faculty members seem happy to work with and mentor students and are very supportive of the graduate program. However, as mentioned earlier in this report, graduate students highlighted the inconsistency of faculty mentoring.

Graduate students liked that faculty members are very engaged with industry, although it was apparent to the review committee that grant research may be different than what industry wants or perceives to need.

Recommendations:

i. See recommendation e about providing professional development for mentoring students.

11. Viability of scholarly community within which students can interact

Graduate students reported that they were very happy with the opportunity to be able to interact with multiple disciplines within the program. The close proximity of USDA facilities and scientists was identified as a big positive to graduate students, faculty, and the review team. The addition of entomology faculty within the department was mentioned as greatly adding to the overall balance and breadth of the program. It was pointed out that a majority of professional plant breeders in horticulture and crop science are located in the Willamette Valley and serves as another positive addition to the local scholarly community.

Recommendations:

j. Continue to pursue and cultivate opportunities for student interaction outside of the horticulture department community. This could include more interaction with faculty in other OSU Departments such as Crop Science and Botany and Plant Pathology.

12. Professional viability of graduates

Graduate faculty advisors reported that 75% of MS students and 100% of Ph.D. students have produced scholarly output in the form of publications from their theses and dissertations. Graduate students, however, report that they are not having discussions with their advisors early on about how authorship will be/is apportioned. Post-graduation employment data shows that, of those graduates contacted, most are working in a position either directly or somewhat directly related to their degree. A sizeable number of the students contacted are employed in academia, either as tenure-track or non-tenure track faculty. However, only Ph.D. students have a required teaching component in their degree program.

Recommendations:

k. Consider including expectations for authorship to the orientation handbook.

l. The OSU Graduate School is in the process of offering a teaching certificate. Consider adding this teaching certificate to both M.S. and Ph.D. degree programs.
13. Satisfaction of students and graduates

Graduate students expressed satisfaction with being able to design their own program of study. They noted as strengths not having to worry about financial support (they are all funded), the diversity of course offerings, and the diversity of faculty. There is a very active graduate student group that facilitates camaraderie and peer mentoring. Graduates students especially noted that Anita Azarenko, Head of the Horticulture program, makes an effort to come to their meetings. Students remarked that they feel comfortable taking their concerns to either Anita Azarenko or to John Lambrinos, Graduate Program Coordinator. Overall, they feel that the administration, faculty, and office staff are very supportive. They characterized the department as one with “no stress” and a “happy atmosphere.”

Despite the diversity of courses listed in the catalog, many of the courses are not offered. This makes it difficult for students to plan their program of study. Students expressed frustration that there are not enough stand-alone courses and too many slash courses. Students cited a need for a course where they can learn how to write a proposal (e.g., how to do a literature review). Some also expressed a desire for seminars or workshops on how to use shortcuts in Microsoft software programs and how to deal with data management.

Graduate students noted that there are different expectations from different advisors, and that there is no annual GRA review.

Recommendations:

m. Streamline course listings in the catalog by eliminating courses no longer offered. Provide a list of recommended courses, seminars, and workshops and what term they are offered.

n. Consider requiring annual GRA reviews so that students and advisors assess progress towards degree completion.

14. Ranks/rating: N/A because of the methodology of the rating organizations

CONCLUSION

The review committee concluded the graduate program in horticulture should be maintained. The recommendations within this report should be followed up with a response on how the program is going to address the issues raised. The committee feels with a few minor changes the program will gain strength within Oregon State University as well as with horticulture programs around the country.

List of recommendations that need to be addressed to continue to strengthen the graduate program in horticulture:
a. **Develop a recruiting effort that targets diverse populations** interested in horticulture. This may be done in conjunction with related programs (e.g., crop and soil science, botany and plant pathology). One idea used successfully in other programs is a “recruitment weekend,” that brings together a group of excellent candidates to learn more about the opportunities available at OSU. Resources at OSU can help identify low-income, first generation, and other non-representative student populations.

b. **Pursue alternative methods for supporting students beyond external dollars.** These methods could include sharing GTA positions with other programs (e.g., Biology), Laurel Grants to fund tuition, Provost awards, e-campus revenue, etc. These supplementary funds can also be used as incentives for faculty who agree to provide service to the graduate program (e.g., teach horticulture classes). Also see discussion below about financial support.

c. **Offer courses in innovative ways or in different formats** to take advantage of the expertise within the graduate horticulture faculty on and off campus.

d. **Pursue cross listing courses and/or team teaching critical courses** to meet the disciplinary needs of students in horticulture.

e. Explore possibility of **creating housing opportunities** at statewide facilities to encourage wider use by Corvallis-based students and faculty. This could be done in conjunction with other programs and units.

f. Consider a new way of **delivering and/or marketing orientation services** to students. This may be especially important as students begin the program during different terms.

g. Provide **professional development regarding mentoring relationships** for both faculty and students. The handbook already contains a great example of responsibilities of both parties, and additional information can be provided in seminars, checklists, trainings, etc.

h. Although student performance overall is good, additional consideration regarding the recruitment of excellent performing students would no doubt increase the level and quality of student performance within the graduate program (see recommendations a and b above).

i. See recommendation e about providing professional development for mentoring students.

j. **Continue to pursue and cultivate opportunities for student interaction outside of the horticulture department community.** This could include more interaction with faculty in other OSU Departments such as Crop Science and Botany and Plant Pathology.

k. Consider including **expectations for authorship** to the orientation handbook.

l. The OSU Graduate School is in the process of offering a teaching certificate. Consider adding this **teaching certificate** to both M.S. and Ph.D. degree programs.

m. **Streamline course listings** in the catalog by eliminating courses no longer offered. Provide a list of recommended courses, seminars, and workshops and what term they are offered.

n. Consider requiring **annual GRA reviews** so that students and advisors assess progress towards degree completion.