

UNIT REPORT

Plant Molecular & Cellular Biology (PhD) - 01.Reviewer's Report - Academic Data

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Plant Molecular & Cellular Biology (PhD)

PhD in Plant Molecular and Cellular Biology Mission

Mission:

The mission of the Plant Molecular and Cellular Biology (PMCB) Program is to educate and train highly qualified graduate students to understand the basic molecular and cellular mechanisms that mediate plant development, adaptation, and evolution. PMCB is deeply committed to prepare students to develop into successful biological scientists, capable of conducting independent fundamental and applied research, and excel in their chosen field, including bioinformatics, genomics, proteomics, genetics, biochemistry, breeding, physiology, molecular and cellular biology. PMCB supports the missions of the college and university to serve the nation's and state's critical needs by contributing to a well-qualified and broadly diverse citizenry, leadership and workforce through graduate education and to expand our understanding of the natural world, the intellect and the senses through graduate student research.

Program Type and Level: Research Doctorate

Start: 07/01/2022

End: 06/30/2023

Program: Plant Molecular & Cellular Biology (PhD)

Program CIP: 26.0308

Site Information: On Campus (Residential)

If Other Site: :

Responsible Roles: Joel Brendemuhl (brendj@ufl.edu)

PG 1 Train Students

Goal: To train students in genetics, biochemistry and molecular biology.

Program: Plant Molecular & Cellular Biology (PhD)

Evaluation Method:

- Percentage of first-year Ph.D. students successfully passing core courses.
- Percentage of Ph.D. students advancing to candidacy by the end of their third year of enrollment.

Results:

- We evaluated the 2022-2023 cohort of Ph.D. students for performance in four core courses: PCB 5065, PCB 6528, HOS 6932, and PCB 5530.
 - 5/5 (100%) Ph.D. students successfully completed these four core courses with a B+ grade or better.
- For the purpose of this goal, we evaluated cohorts 2017-2020 for time to candidacy.
 - 3/5 students in cohort 2017-2018, 5/5 students in cohort 2018-2019, and 5/6 students in cohort 2019-2020, 5/6 students in cohort 2020-2021 advanced to candidacy well before the end of their third year from admission to PMCB. The average time to candidacy is summarized in the table below.

Cohort	Average Time to Candidacy (years)	Number of Students Evaluated
2017-2018	1.95	3
2018-2019	1.96	5
2019-2020	2.12	5
2020-2021	2.12	6

PG 2 Evaluate Scientific Literature

Goal: To train students how to evaluate scientific literature and develop critical thinking skills.

Program: Plant Molecular & Cellular Biology (PhD)

Evaluation Method:

- Journal colloquia offerings in the fall and spring semester

Results:

In the Fall 2022 semester we had two journal colloquia offerings, and in the Spring 2023 semester we had three journal colloquia offerings. All PMCB students were enrolled in one of these both semesters.

PG 3 To enhance the professional development of students**Goal:**

To support students' professional development through participation in conferences and dissemination of their research results via journal publications.

Program: Plant Molecular & Cellular Biology (PhD)

Evaluation Method:

- The percentage of students enrolled between the 2019-2023 academic years who published at least one first-author publications from their dissertation research. Publications from currently enrolled students were also tallied.
- The percentage of students enrolled between the 2019-2023 academic years with one or more publications co-authored with their advisors or other collaborators.
- Student participation and oral presentation delivery in the Annual PMCB Workshop was evaluated. This one-day conference is a forum for students to present their research in short talk form and interact with one or more prominent external speaker(s). Three student travel grants are awarded for best talks.
- Percentage of students presenting at national/international conferences in 2022-2023 was evaluated.
- Number of awards, fellowships, and other accomplishments of national and international recognition.

Results:

100% of our 2018-2022 graduates published at least one first-author journal publication. The average number of first-author publications per student was 1.68.

70% of our 2018-2022 graduates co-authored publications with their advisors (in this category, the student was not the first author). The average number of co-authored publications per student was 1.65.

11/20 (55%) students presented (orally and/or poster) at at least one national or international conference.

During the 2022-2023 academic year our students received the awards and fellowships of national and international recognition listed in the table below.

Student Awards of National and International Recognition	
Ghimire, Lushan	Rockey FFAR fellowship 2022-2025, Foundation for Food and Agriculture Research
Perron, Noe Coenttin	Fulbright Scholarship
Other Student Awards	
Boyd, Jade	Grinter Fellowship
	Corteva Student Showcase Award at ASPB's Plant Biology 2023 Conference (travel award)
Cheng, Xi	CALS Deans Award
	Runner-up for best talk and paper award, Spring 2023 Semester
Cromie, Juliana	Third Prize for Oral Research Presentation. PMCB Symposium, May 2023
	Graduate School Council Travel Grant
	Borlaug Scholar, National Association of Plant Breeders, April 2023
	Graduate Student Mentoring Award. UF Graduate School, April 2023
	Bayer Encompass Scholar, January 2023
Ghimire, Lushan	Travel award: Tools for Polyploid Breeding Workshop, San Diego, 2023
	Edward E. Fisher Scholarship, CALS, UF, 2021
Jacobson, Talia	Davidson Memorandum Travel Grant
Kelly, Megan	Bayer Grants 4Ag recipient, \$10,000

Laforest, Larissa	Runner-up: Best Student Presentation Award 2022 Plant Molecular and Cellular Biology (PMCB) Annual Workshop
	IFAS Travel Grant (Summer 2023)
	Latin American and Caribbean Scholarship (2021-2023)
	Corteva Student Showcase Award to ASPB 2023 (Summer 2023)
Madrid Caviedes, Gabriela Paz	Latin American and Caribbean Scholarship (2021-2023)
	James Davidson Graduate Travel Scholarship
	GSC Travel Grant
	Corteva Student Showcase at ASPB's Plant Biology 2023
Mourad, Nadia	Runner-up for Best Talk at PMCB Symposium 2023.
	ASPB Ambassadorship 2023-2024
	ASPB Travel Award
Perron, Noe Corentin	Summer 2023 – Graduate Student Council Travel Grant – University of Florida
	Summer 2023 – IFAS Travel Grant – University of Florida
	Spring 2023 – Travel award based on abstract selection - R. F. Baker Plant Breeding Symposium, Iowa State University
	Spring 2023 – Speaker competition award, 3rd place - University Minnesota 2023 plant science symposium
Schmidt, Henry	2nd place position for excellent performance in the poster competition at the 7th Annual Plant Science Symposium
Strickland, Hunter F	CALS Deans Award
Vela, Saddle M.	Graduate School Council Travel Grant
	LUNA Travel Grant to attend the 2022 AISES National Conference in Palm Springs, CA
Wolf, Emily S. A.	Best oral presentation from the Plant Molecular and Cellular Biology Program Workshop
	Graduate School Council Travel Grant
Zhao, Mingxi	2023 IS-MPMI Congress Travel Award

Wilfred Vermerris (Director), Nian Wang (Graduate Coordinator) and Emily Murphy (Academic Program Specialist I) reviewed the data and prepared this report.

SLO 1 Knowledge

Outcome: Identify knowledge gaps, formulate hypotheses, design and execute experiments

SLO Area (select one): Knowledge (Grad)

Assessment Methods Checklist: Faculty Evaluation/Review

Qualifying/Comprehensive Examination

Other - please describe in the Assessment Method Narrative.

Assessment Method Narrative:

For SLO #1, our assessment is based on the percentage of students advancing to candidacy after they pass the written and oral candidacy exams at the Ph.D. level. Students submit to their supervisory committee members a research proposal in NSF, USDA or DOE format. The students subsequently give a ~45 minute public presentation describing their research topic, progress to date, and research plans. The written and oral parts of the candidacy exam require students to demonstrate that they can think independently and are capable of conducting independent fundamental and applied research. These criteria demonstrate that students have achieved the necessary skills to evaluate, design, and propose research projects related to plant molecular and cellular biology.

SLO Not Assessed This Year:

Threshold of Acceptability: 85

How many students did you assess for this outcome?: 43

How many students met the outcome?: 37

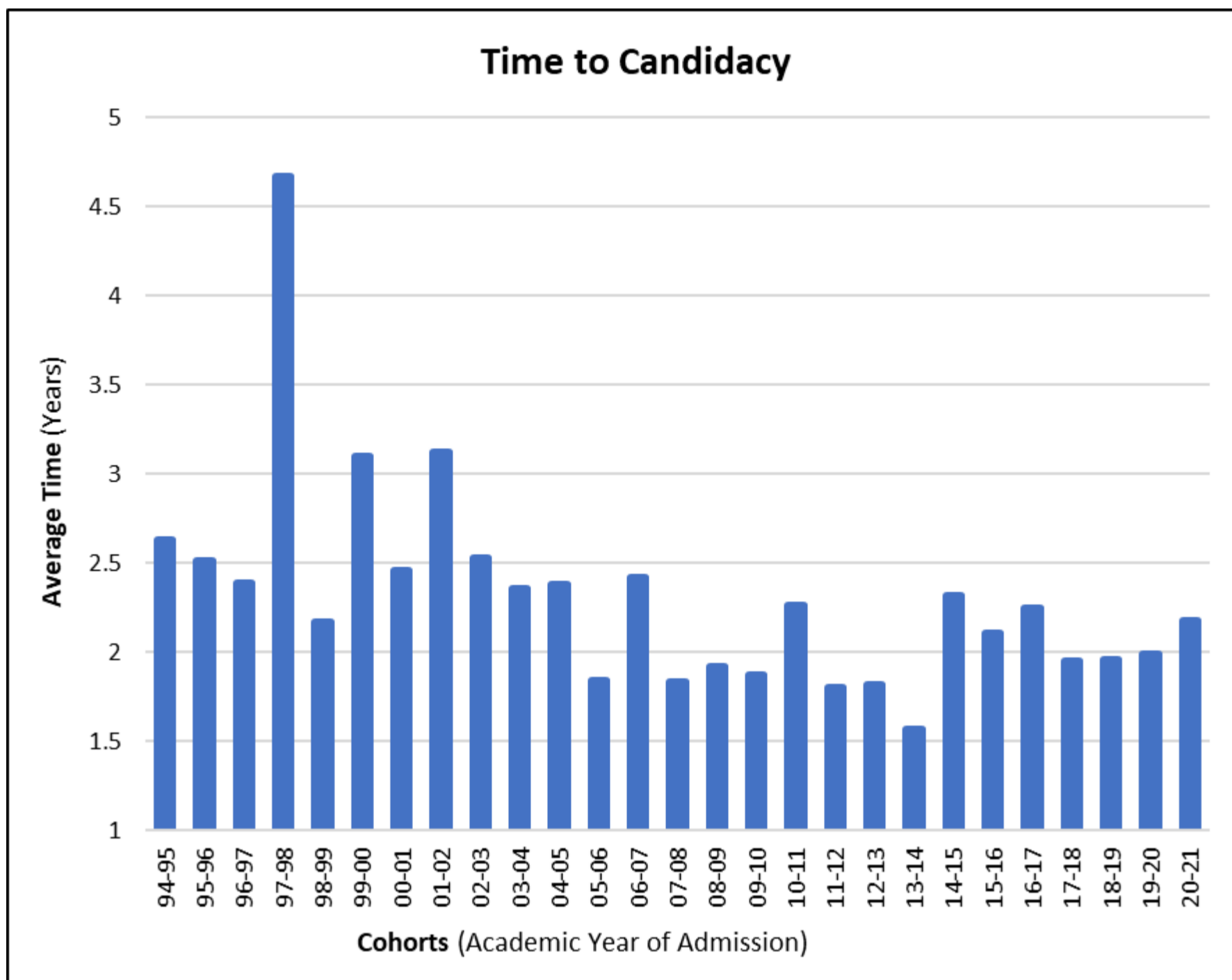
What percentage of students met the outcome?: 85

Does this meet your threshold of acceptability?: Yes

Results:

- 3/5 students in cohort 2017-2018, 5/5 students in cohort 2018-2019, 5/6 students in cohort 2019-2020, and 4/5 students in cohort 2020-2021 advanced to candidacy well before the end of their third year from admission to PMCB. The average time to candidacy is summarized in the table below.

Cohort	Average Time to Candidacy (years)	Number of Students Evaluated
2017-2018	1.95	3
2018-2019	1.96	5
2019-2020	2.12	5
2020-2021	2.18	5



- 17 of 18 students advanced to candidacy (94%) which is above our threshold. One student has been late to complete the qualifying exam due to a major flaw in their project. This student, however, is on track to meet this objective by the end of this year.
- 3/4 of students graduating during the 2022-2023 academic year completed their Ph.D. degree within 5 years. The average time to degree was 4.6 years for these 4 students. This meets our expectations and shows we are meeting our goal of keeping the number of years from enrollment to graduation well below the expected five years.

The format of the candidacy exam appears to be working well in meeting the student learning outcome.

PMCB faculty represent seven different departments in three colleges. Hence, each faculty member is always affiliated with a departmental graduate program that may use a different format for its candidacy exam. In order to maintain a consistent standard for all PMCB graduate students, it is important that all advisors are aware of the format and expectations of the candidacy exam, regardless of their departmental affiliation. We have noticed some variation in the way the candidacy exam was conducted (timing, format). In order to reduce this variation, we have initiated a meeting with the second-year students and their advisors in January during which we outline the expectations. We encourage completion of the candidacy exam by the end of the summer of the second year and have followed up on a regular basis to make sure sufficient progress is being made towards this goal.

SLO 2 Knowledge

Outcome: Ability to critically evaluate the primary scientific literature.

SLO Area (select one): Knowledge (Grad)

Assessment Methods Checklist: Presentation(s)
 Faculty Evaluation/Review
 Qualifying/Comprehensive Examination
 Dissertation

Assessment Method Narrative:

Students take a mandatory one-credit Journal Colloquium course each fall and spring semester until they graduate from the program.

The student's supervisory committee evaluates the student's scientific literacy during the candidacy exam and the dissertation defense.

SLO Not Assessed This Year:

Threshold of Acceptability: 90

How many students did you assess for this outcome?: 64

How many students met the outcome?: 58

What percentage of students met the outcome?: 91

Does this meet your threshold of acceptability?: Yes

Results:

- 26 out of 26 (100%) of our Ph.D. students enrolled journal colloquia in Fall 2022 and Spring 2023. 26/26 successfully passed the instructor(s) evaluation of an article presentation in their Fall 2022 and Spring 2023 Journal Colloquium classes.
- The results and threshold of acceptability of the oral exam defense (advancement to Ph.D. candidacy) were explained and detailed in SLO #1. 13 out of 19 passed the outcome (68%) which does not meet the threshold. One student is delayed due to a delay in her project, one student left the program, and all other students are on track to complete their exams by this Fall.
- The results and threshold of acceptability of the final exam and dissertation defense (were explained and detailed in SLO #1 19 of 19 (100%) students passed their final exams and dissertation defense from the 2019-2020, 2020-2021, 2021-2022, 2022-2023 cohorts.

SLO 3 Skills

Outcome: Complete plant biology research of sufficient quality to be published in peer-reviewed journals.

SLO Area (select one): Skills (Grad)

Assessment Methods Checklist: Paper(s) - includes reports, plans, other documents
 Other - please describe in the Assessment Method Narrative.

Assessment Method Narrative:

For SLO#3, we determined the percentage of students enrolled between the 2018-2023 academic years who published one or more peer-reviewed journal publications co-authored with their advisors or other collaborators.

SLO Not Assessed This Year:

Threshold of Acceptability: 80

How many students did you assess for this outcome?: 38

How many students met the outcome?: 30

What percentage of students met the outcome?: 79

Does this meet your threshold of acceptability?: No

Results:

- 100% or 19 out of 19 of our 2019-2023 graduates published at least one first-author paper. The average number of first-author papers per student was 1.65.
- 58% or 11 out of 19 of our 2019-2023 graduates co-authored publications with their advisors. This does not meet our expectation of 80%. The average number of co-authored publications per student was 2. **Submitting a first-author publication is required for scheduling the dissertation defense. The co-authored publications tend to cover research that the student was involved in, but not to the same extent as the dissertation research. It is common for these publications to come out after the student's graduation, so they are not self-reported. We plan to start monitoring this more closely in a database of student publications.**

SLO 4 Skills

Outcome: Communicate effectively using scientific writing and oral presentation skills.

SLO Area (select one): Skills (Grad)

Assessment Methods Checklist: Paper(s) - includes reports, plans, other documents
 Faculty Evaluation/Review
 Qualifying/Comprehensive Examination
 Other - please describe in the Assessment Method Narrative.

Assessment Method Narrative:

For SLO #4, the student's supervisory committee evaluates writing and presentation skills during the exams for advancement to Ph.D. candidacy. The students' presentation skills are also evaluated during the annual PMCB workshop.

Furthermore, we evaluate the percentage of students with first author and co-authored publications, as well as the percentage of students, who gave oral and/or poster presentations at a national or international conference. Lastly, the writing skills are evaluated during the review of the dissertation.

SLO Not Assessed This Year:

Threshold of Acceptability: 80

How many students did you assess for this outcome?: 97

How many students met the outcome?: 83

What percentage of students met the outcome?: 86

Does this meet your threshold of acceptability?: Yes

Results:

- 3/5 students in cohort 2017-2018, 5/5 students in cohort 2018-2019, 5/6 students in cohort 2019-2020, and 4/5 students in cohort 2020-2021 (81%) advanced to candidacy well before the end of their third year from admission to PMCB.
- 19 out of 19 (100%) of our 2019-2023 graduates published at least one first-author paper, 11 out of 19 (58%) of our 2019-2023 graduates co-authored publications with their advisors.
- 16 out of 16 (100%) second-year and more advanced students (excluding Fall 2022, Spring 2023, and Summer 2023 graduates) presented their research orally during our annual workshop while our first-year students are required to moderate the workshop sessions. The results exceed our criterion of success.
- 20 out of 22 (91%) students had either oral or poster presentations at a national or international conferences or meetings in addition to our PMCB Workshop. Our 2022-2023 average was 3.4 conference presentations per student. The ability to communicate scientific results to peers is an important skill that is generally assessed during a job interview. This SLO thus ensures that PMCB graduates can be competitive for positions they apply for. This SLO appears to be working well, based on how the quality of presentations during the annual PMCB symposium improves as students' progress through the program.

SLO 5 Professional Behavior

Outcome: Effectively work in teams with peers interacting honestly, ethically and with cultural sensitivity.

SLO Area (select one): Professional Behavior (Grad)

Assessment Methods Checklist: Faculty Evaluation/Review
 Other - please describe in the Assessment Method Narrative.

Assessment Method Narrative:

Faculty and supervisory committee observations as evaluated by the PMCB Annual Graduate Student Evaluation.

SLO Not Assessed This Year:

Threshold of Acceptability: 95

How many students did you assess for this outcome?: 25

How many students met the outcome?: 24

What percentage of students met the outcome?: 96

Does this meet your threshold of acceptability?: Yes

Results:

- Our criterion for success is to have 95% of student evaluations for the 2022-2023 academic year with satisfactory or better performance.
- 24/25 students of our Ph.D. students had satisfactory or better evaluations for the 2022-2023 academic year.

PhD - Plant Molecular and Cellular Biology

Improvement Types Checklist: Revised one or more existing Program Goal evaluation methods.

Use of Results for Improvement Narrative - Required:

DEGREE PROGRAM: PH.D.

PG #1: To train students to conduct research in the areas of plant genetics, biochemistry and molecular biology.

In 2022 we suspended the first-year exam in consultation with the newly selected faculty advisors of the first-year students. This exam used to include an in-class and a take-home exam that evaluated how well the first-year students were able to apply the information covered in the core courses. During the pandemic, the in-class portion of the exam had been eliminated. In recent years the exam had become a source of contention for the following reasons: 1) It caused substantial emotional stress among the first-year students; 2) It had become difficult to find

faculty members willing to compose and grade the exams; 3) The newly selected mentors of the first-years students were unhappy that their students disappeared for 6 weeks to first prepare and then take the exam. The argument in favor of abolishing the exam was that the core courses have exams during the regular exam period that evaluate whether the students master the material. Any deficiencies would be apparent from the exam results. We analyzed the performance on the first-year exam and the course grades during the past 10 years and determined that the grades for the core courses were a good indicator of the performance on the first-year exam. We will propose to the faculty to permanently abolish the first-year exam. This will enable the first-year students to focus on their dissertation research as soon as they have selected a faculty advisor, which has the benefit they will be ready sooner to take the candidacy exam and complete their degree.

PG #2: To offer courses that allow students to practice critical evaluation of the primary scientific literature in plant genetics, biochemistry and molecular biology. We interpreted these results to indicate that Ph.D. students are successfully developing essential critical thinking skills to evaluate scientific literature.

PG #3: To support students' professional development through participation in conferences and dissemination of their research results via journal publications.

We interpreted the results to indicate that program curriculum changes have successfully reduced the time to degree.

Now that there are more conference opportunities available there is a significant increase in the attendance by PMCB graduate students.

SLO #1: Identify knowledge gaps, formulate hypotheses, design and execute experiments. We interpret the time it takes to meet the program benchmarks to be good indicators of successful training in critical thinking for research design and evaluating experiments.

We will continue with the current assessment method, but are advocating the completion of the candidacy exam by the start of the third year (rather than by the end of the third year) by explaining the format and expectations of the candidacy exam with the second-year students and their advisors. Our expectation is that on average, this expedited schedule will enable a greater number of students to complete their dissertation research in four years.

We have observed a steady reduction in the time to degree with a parallel reduction in the total number of publications produced by the students completing the faster curriculum. The reduction in the number of publications per students is likely the result of the increased pressure on graduate programs to accelerate their students' graduation, causing them to not have sufficient time to publish the entire body of work from their dissertation before the defense. In most cases, the dissertation research is published within a year of graduation, but this is not taken into account in the current assessment.

SLO #2: Ability to critically evaluate the primary scientific literature. Journal Colloquia topics have typically been taught by PMCB faculty. In a fall 2015 faculty meeting, members voted to allow students to take journal colloquium courses related to their research interests offered by other UF departments and/or programs. This was effective spring 2016 and students could choose from a broader selection of topics. Faculty reiterated the importance of students taking journal colloquia courses outside PMCB. The success of our graduate students in diverse journal colloquia courses indicated that our Ph.D. students are successfully developing thinking skills to evaluate current primary scientific literature.

The performance on the oral portion of the Ph.D. candidacy exam and on the dissertation defense are also good indicators that the students have achieved this SLO.

SLO #3: Complete plant biology research of sufficient quality to be published in peer-reviewed journals.

These criteria were reviewed by the PMCB faculty in a fall 2014 faculty meeting. The faculty waived the previous requirements of having a first-author manuscript accepted for publication before the dissertation defense can be scheduled. This requirement is difficult to achieve due to the frequent extensive time required for manuscripts to be reviewed and required revisions to be prepared, submitted and accepted. The faculty voted to require all PMCB Ph.D. students to have a first-author manuscript submitted to peer-reviewed journals before graduation.

SLO #4: Ability to communicate effectively using through scientific writing and oral presentations skills.

Our metrics show that thanks to the rapid implementation of videoconferencing technologies at UF, our students have managed to find opportunities to give oral and poster presentations and have thus mitigated some of the negative impacts of travel restrictions and in-person conference cancellations. This has also given the opportunity to PMCB students to get exposed to videoconferencing, the latter requiring quite distinctive skills as compared to conventional face-to-face presentations.

SLO #5: Ability to work effectively work in teams with peers, interacting honestly, ethically and with cultural sensitivity.

The PMCB curriculum requires team efforts with honest and ethical behavior for academic success. The high academic performance level of the Ph.D. students indicated that students are effectively meeting this SLO.

Our graduate student annual evaluations clearly delineate academic performance from graduate/research assistant performance. The performance evaluation period is also aligned with the academic year and graduate assistantship contract periods. We have consistently collected accurate assessment of student progress on an academic year basis. The collection of annual student evaluations is strictly enforced.

GOALS FOR THE 2023-2024 ACADEMIC YEAR:

To get all second-year students to pass their candidacy exam by the middle of the fall semester of their third year.

To continue to successfully train Ph.D. students in plant genetics, biochemistry, and molecular biology.

To continue to enhance the professional development of graduate students.

To continue to place students in scientific, industry, government and non-profit sector careers.

Wilfred Vermerris (Director), Nian Wang (Graduate Coordinator) and Emily Murphy (Academic Program Specialist I) reviewed the data and prepared this report.

Program Results Not Reported This Year:

Program Results Reporting Complete: true

Plant Molecular & Cellular Biology (PhD) Detail

Providing Department: Plant Molecular & Cellular Biology (PhD)

Assessment Cycle:

Assessment Cycle for:

Ph.D. in Plant Molecular and Cellular Biology College of Agricultural and Life Sciences

Analysis and Interpretation: Summer term in odd years

Program Modifications: Completed by Spring term in even years

Dissemination: Completed by July 31 in even years

Narrative for Assessment Cycle timeline:

SLOs are assessed at the transitions between new program Directors and Graduate Coordinators. Both of these leadership positions in PMCB rotate every two years with individual faculty members making a four-year commitment to serve as Graduate Coordinator in years 1-2 and Director in years 3-4. During the transition between Graduate Coordinators, the PMCB Academic Coordinator (Eliana Kampf) collects comprehensive data on the SLO assessments. These data are then analyzed by the new Director and Graduate Coordinator. A report is prepared for the PMCB faculty and college administration. The PMCB curriculum committee, which is chaired by the Graduate Coordinator, then uses this report to develop recommendations for curriculum changes if needed. These recommendations are voted on by the PMCB faculty in accordance with PMCB by-laws and implemented in the following academic year. Any curriculum changes are disseminated to the PMCB faculty and students directly and posted on the program’s website.

Year	21-22	22-23	23-24	24-25
SLOs				
Content Knowledge				
#1	X		X	x
#2	X		X	x
Skills				
#3	X		X	x
#4	X		X	x
#5	X		X	x
Professional Behavior				
#6	X		X	x

SLO Assessment Rubric:

Figure 1: ANNUAL EVALUATION FOR GRADUATE STUDENTS IN THE PMCB PROGRAM

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 Plant Molecular & Cellular Biology Program

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ANNUAL EVALUATION FOR GRADUATE STUDENTS IN THE PMCB PROGRAM

EVALUATION PERIOD:

DEADLINE TO RETURN COMPLETED FORMS:

Graduate student: please respond through part D and schedule a follow-up meeting with advisor(s). **Advisor:** please complete parts E, F and G (with signatures) during follow-up meeting with student.

Today's Date: ____/____/____

Name:

Major Advisor (or co-advisor):

Degree Being Pursued (M.S. or Ph.D.):

ACADEMIC PERFORMANCE**A. GENERAL INFORMATION**

1. When did you enter your current degree program? ____/____/____

2. If pursuing a Ph.D., have you completed your Candidacy (Qualifying) exam?

Y / N Date passed: ____/____/____

3. Have you submitted your research proposal? Y / N

4. On how many occasions have you met with your full committee this year?

5. When do you expect to graduate? ____/____/____

6. List members of your graduate committee:

B. PRESENTATION OF YOUR WORK / PERSONAL DEVELOPMENT

1. Which formal courses did you complete in the last year? Please indicate grades received.

2. What scientific meetings did you attend?

a)

b) Did you present a poster/oral presentation? Y / N (If yes, circle which)

c) Did you present a poster/oral presentation? Y / N (If yes, circle which)

3. Did you complete a manuscript(s)? Y / N

If so, give title(s), where submitted and status of manuscript (submitted, accepted, in press, published):

4. What do you expect to accomplish in the next 12 months?

5. During the next 12 months, what percentage of your time do you plan to spend on:

(One week is approximately 2.5% of a year)

- experiments and data analysis _____%

- writing _____%

- reading literature _____%

- teaching _____%

- attending courses or meetings _____ %

- other (specify) _____ %

GRADUATE ASSISTANT DUTIES (Personnel):

C. SCIENTIFIC PROGRESS

1. What was your project plan for the last 12 months?

2. a) Is your project on schedule? (Did you meet your project planning?) Y / N

b) If not, please provide details as to which goals were not met, and why

D. TEACHING EXPERIENCE

1. Did you serve as a teaching assistant? Y / N

a) If so, for which course(s)?

b) Describe your duties:

c) What is your opinion of your teaching experience?

E. COMMENTS FROM ADVISOR

ACADEMIC PERFORMANCE

1. Overall evaluation of progress toward degree:

___ Outstanding ___ Commendable ___ Satisfactory ___ Weak ___ Unsatisfactory

2. Assessment of student's progress toward degree:

GRADUATE ASSISTANT DUTIES (Personnel)

1. Overall evaluation of performance:

___ Outstanding ___ Commendable ___ Satisfactory ___ Weak ___ Unsatisfactory. Assessment of student's performance:

OBSERVATIONS OF PROFESSIONAL BEHAVIOR:

F. ADDITIONAL COMMENTS FROM EVALUATION MEETING:**Advisor:****Graduate Student:****G. SIGNATURES**Student

Name: _____

Signature: _____

Date: _____

Graduate Committee Chair:

Name: _____

Signature: _____

Date: _____

Co-advisor (if applicable):

Name: _____

Signature: _____

Date: _____

Assessment Oversight:

Name	Department Affiliation	Email Address	Phone Number
Wilfred Vermerris	Microbiology & Cell Science	wev@ufl.edu	(352) 273-8162

Nian Wang	Microbiology & Cell Science	nianwang@ufl.edu	(863) 956-8828
Emily Murphy	Horticulture Sciences	Emurphy1@ufl.edu	(352) 392-8285

Methods and Procedures - Undergraduate and All Certificate Programs:

Curriculum Map - Undergraduate Degree Programs:

Research :

PMCB doctoral students are trained to become professional scientists in plant biology with an emphasis on molecular biology, cell biology, genetics, genomics, and biochemistry. Ph.D. graduates are expected to be able to read, interpret, and critique primary and review literature in the field of plant biology. Graduates will be able to design experiments in PMCB related disciplines and be able to propose these experiments effectively in written grants. Students have extensive, hands-on experience in designing and conducting wet-bench, field, and/or computational research. Graduates are expected to be able to disseminate their research results in oral presentations as well as written documents including conference presentations, grant proposals, peer-reviewed journal articles, and a dissertation.

Research training begins in the first year of study with three laboratory rotations of 8-10 weeks. The students are expected to develop results sufficient for a fifteen minute public presentation at the end of each rotation. In parallel, the core courses emphasize critically reading the primary literature and designing experiments. These research skills are then assessed in a written qualifying exam at the beginning of the third term.

In year two, students develop preliminary data for their dissertation research proposal as well as a NSF-style proposal with the planned experiments for their dissertation research. This proposal is assessed through a public seminar followed by an oral exam with the supervisory committee. Students complete their dissertation research based on the supervisory committee evaluation and suggestions. Starting in year two, students also present a short, conference-style talk at the program's annual Workshop, which is a day and a half retreat. The students compete for travel awards to present their research at nation or international conferences. To graduate, all Ph.D. students must write a first-author journal article. This paper needs to be accepted in a peer-reviewed journal prior to graduation. Students also write a dissertation, present a seminar, and defend the dissertation with an oral exam given by their supervisory committee.

SLO Measures - Graduate and Professional Programs:

The PMCB SLOs are assessed through a mixture of direct and indirect measures. The knowledge SLOs are assessed directly by a core written exam given at the beginning of the summer term for first year students, in the second year candidacy exam, and at the oral exam at the dissertation defense. The skills SLOs are assessed directly by the written dissertation proposal, dissertation, and first-author peer-reviewed publication. The research and critical thinking skills as well as the professional behavior SLOs are indirectly measured through the cumulative grades from journal colloquium, annual evaluations of the academic progress of each student, annual scholarly presentations at the PMCB Workshop, and through job placement and publication records from graduated students. The students' annual evaluation collects data regarding the supervisory committee consensus on academic progress as well as professional development metrics such as presentations at conferences, submission of proposals for fellowships and grants, and submission of manuscripts for publication.

Example assessment method and rubric – Annual Evaluation for Graduate Students in the PMCB Program:

Written evaluations are administered once a year to review students' progress in their research project and toward meeting their degree requirements. These evaluations assess the student's academic performance and job performance as a graduate assistant or fellow. The intent of the annual evaluation is to facilitate and standardize graduate student assessment by rigorously assessing on a yearly basis whether students have the ability to succeed at the Ph.D. level in the PMCB Program.

The students' annual evaluation collects data regarding the supervisory committee consensus on academic progress as well as professional development metrics such as presentations at conferences, submission of proposals for fellowships and grants, and submission of manuscripts for publication. Observations of professional behavior (SLO #6) are noted on the form and discussed with the student.

Students must answer academic performance questions such as the expected duration of their studies, completion of their qualifying (candidacy) exams, frequency of committee meetings, grades earned in formal courses, scientific meetings attended and whether a presentation was delivered (poster or oral), submission and status of manuscripts (submitted, accepted, in press, published), plans and goals for the next 12 months (with percentages dedicated to experiments and data analysis, writing, reading literature, teaching, etc).

Students are also expected to complete questions related to their performance as graduate assistants or fellows describing their teaching experience and scientific progress including, but not limited to, student's productivity, quality and quantity of work and research and other creative programs and contributions.

All the metrics above must be assessed and signed by the student and his/her advisor. A meeting must be scheduled between the advisor and the student to discuss progress and what needs to be accomplished for the following 12 months. First year rotating Ph.D. students will have their evaluations completed by the director and graduate coordinator.

Please refer to Figure 1, a copy of the Annual Evaluation for Graduate Students in the PMCB Program.

Assessment Timeline - Graduate and Professional Programs:

Ph.D. in Plant Molecular and Cellular Biology

College of Agricultural and Life Sciences

Assessment Timeline for Plant Molecular and Cellular Biology (PMCB) Graduate Program

Assessment SLOs	Assessment 1: Core courses and journal clubs	Assessment 2: Qualifying exam	Assessment 3: Annual evaluation with supervisory committee	Assessment 4: Annual evaluation with supervisory committee
Knowledge				
#1	Knowledge of plant molecular and cellular biology	Scientific literacy	Scientific Writing	Knowledge of plant molecular and cellular biology
#2	Knowledge on the topic of the proposed research	Scientific Writing	Knowledge of plant molecular and cellular biology	Deep knowledge on the topic of the research
Skills				
#3	Independent Thinking	Evaluate, design, and propose research projects	Experimental design; laboratory skills	Experimental design; laboratory skills
#4	Scientific writing; oral presentation	Proposal writing; oral presentation	Scientific writing; oral presentation	Scientific writing; oral presentation
Professional Behavior				
#5	Collaboration with PI and lab members	Setting goals	Meeting set deadlines	Receiving feedback
Assessment SLOs	Assessment 5: Dissertation defense			
Knowledge				
#1	Demonstrable knowledge of the topic of the dissertation research			
#2	Discussion of the student's own research in the context of the scientific literature			
Skills				
#3	Self-assessment; submission of journal article; completion of dissertation			
#4	Oral presentation; scientific writing; project planning			
Professional Behavior				
#5	Setting career goals			