

# 1028: APPLIED AND AGRICULTURAL BIOLOGY - DOCTOR OF PHILOSOPHY

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## In Workflow

1. Student Records Office - Programs (gdmart@nmsu.edu)
2. AG Academic Dean (deconner@nmsu.edu)
3. Graduate Dean (rkoodali@nmsu.edu)
4. UPAC - Chair (jlakey@nmsu.edu)
5. Provost (mcateer@nmsu.edu; bgamillo@nmsu.edu)
6. President (lbduran@nmsu.edu)
7. Board of Regents (cavotta@nmsu.edu)
8. Graduate School - Council of Deans (rkoodali@nmsu.edu)
9. Student Records Office - HED (gdmart@nmsu.edu)
10. Student Records Office - CIP (gdmart@nmsu.edu)
11. MA HLC (bgamillo@nmsu.edu)
12. Student Records Office (gdmart@nmsu.edu)

## Approval Path

1. Mon, 01 Jul 2024 22:42:05 GMT  
Gabrielle Martinez (gdmart): Approved for Student Records Office - Programs
2. Mon, 08 Jul 2024 22:32:41 GMT  
Donald Conner (deconner): Rollback to Initiator
3. Mon, 15 Jul 2024 15:50:16 GMT  
Gabrielle Martinez (gdmart): Approved for Student Records Office - Programs
4. Wed, 17 Jul 2024 14:16:03 GMT  
Donald Conner (deconner): Approved for AG Academic Dean
5. Wed, 17 Jul 2024 17:22:11 GMT  
Ranjit Koodali (rkoodali): Approved for Graduate Dean
6. Thu, 29 Aug 2024 18:47:41 GMT  
Joe Lakey (jlakey): Approved for UPAC - Chair
7. Thu, 29 Aug 2024 18:49:31 GMT  
James Mcateer (mcateer): Approved for Provost
8. Mon, 09 Sep 2024 18:05:34 GMT  
Lydia Duran (lbduran): Approved for President
9. Thu, 19 Sep 2024 20:27:37 GMT  
Adam Cavotta (cavotta): Approved for Board of Regents

## New Program Proposal

Date Submitted: Mon, 15 Jul 2024 14:48:00 GMT

**Viewing: 1028 : Applied and Agricultural Biology - Doctor of Philosophy**

**Last edit: Mon, 15 Jul 2024 14:47:57 GMT**

Changes proposed by: Arthur Kindig (arthurk)

## Submission Information

The Degree Type will factor into the level and the submissions that must occur for HED and HLC.

- Community College Types: Applied Associate Degree, Associate Degree, Certificate, Concentration
- Main/Global Campus Undergrad Types: Bachelor's Degree, Concentration, Minor
- Main/Global Campus Graduate Types: Master's Degree, Doctoral Degree, Certificate, Concentration, Minor

### Degree Type

Doctoral Degree

The Degree Title dropdown has all existing degree titles in Banner, if you do not see the one you are looking for you will select "Other" then in the New Degree Title box you will type out the official title of the degree (as you would want it to appear on a students record, transcript, and/or diploma).

### Degree Title

Doctor of Philosophy

**Academic Level**

Graduate

The Catalog Title will be what is displayed in the catalog page. The standard format is Major (Concentration) - Degree Title. (I.e., Mathematics (Secondary Education) - Bachelor of Science. Note: If there is no concentration you would just list the Major - Degree.

**Catalog Title**

Applied and Agricultural Biology - Doctor of Philosophy

**College**

Agricult/Consumer/Environ Sci

**Campus**

Main Campus

**Department**

Entomology/Plant Path/Weed Sci

**Effective Catalog**

2025-2026

If opting for a Global program, specify "Global Campus" under campus type. You must have a Program Proposal on file with Global Campus prior to submission of a new Global program. Contact Global Campus for more information.

**Program Teaching Modality**

Traditional-Face to Face

**CIP Code**

260305 - Plant Pathology/Phytopathology.

**Normal or typical length of time for students to complete the program (in years)**

4.5

**Curriculum Information****Program Learning Outcomes**

	<b>Learning Outcomes</b>
Outcome 1	Graduates will be able to formulate hypotheses, conduct research, and synthesize conclusions as demonstrated through production of a dissertation: 1) Performance in qualifying exam, 2) Defendable dissertation.
Outcome 2	Graduates will effectively communicate scientific information verbally and in written form: Manuscripts submitted to peer-reviewed journals prior to graduation, 2) Performance in departmental seminars, 3) Performance in writing class, 4) Quality of writing in dissertation
Outcome 3	Graduates will demonstrate proficiency in experimental design and quantitative analysis of research data: Performance in statistics classes, 2) Quality of analyses in dissertation, 3) Performance in qualifying exam.
Outcome 4	Students will understand how to conduct scholarly and professional activities in an ethical manner: 1) Performance in ethics class, 2) Frequency of student attendance and participation in professional society functions.
Outcome 5	Graduates will demonstrate thorough knowledge of their chosen discipline within entomology, plant pathology or weed science. Possible assessment: 1) Performance in disciplinary courses, 2) Knowledge of discipline in comprehensive exam, 3) Depth of disciplinary information in dissertation.

**List of academic departments/units and or institutions involved in the delivery of courses****Department/Unit**

Applied Statistics; Biology; Computer Science; Geography; Entomology, Plant Pathology and Weed Science; Molecular Biology; Plant and Environmental Sciences; Animal and Range Sciences

The Course Requirements, need to be in the standard format for the catalog because this piece of the form will be imported directly onto the catalog page. See the Student Records Website for a guide. The total number of credits at the bottom of the course list will be the "official" total for the degree. Please make sure it adds up correctly.

**Course Requirements****Course Work**

Students are required to take the following:

Prefix	Title	Credits
EPWS 525	Advanced Scientific Writing (OR EPWS 613)	3
EPWS 613	Scientific Writing (OR EPWS 525)	3
EPWS 690	Doctoral Seminar	3
EPWS 6991	Doctoral Research	3 (maximum of 6 count toward degree)
EPWS 7000	Doctoral Dissertation	18
BIOL 540	Science and Ethics	3
Students will take at least 12 credits from the following		12
EPWS 525 or EPWS 613	Advanced Scientific Writing Scientific Writing	3
EPWS 640	Tropical Insect Ecology	3
EPWS 660	Ecology and Management of Invasive Plant Species	3
EPWS 662	Parasitology	3
EPWS 675	Urban Entomology	3
EPWS 6996	Advanced Topics	1-6
Students are required to take at least 6 credits from the following:		6
A ST 503	SAS Basics	3
A ST 504	Statistical Software Applications	1
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	0,3
A ST 509	Statistical Models for Complex Data Structures	3
A ST 511	Statistical Methods for Data Analytics	3
A ST 515	Statistical Analysis with R	3
A ST 540	Predictive Analytics	3
BIOL 562	Advanced Genomics Technology	3
BIOL 566	Advanced Bioinformatics and NCBI Database	3
C S 482	Database Management Systems I	3
PLEN 6425	Biometrical Genetics and Plant Breeding	3
PLEN 6610	Introduction to Environmental and Ecological Modeling	4
<i>Courses, including special topics, can be substituted with advisor's approval. Additionally, new approved graduate level courses may be submitted with advisor's approval. Students can take a combination of the following to complete their degree:</i>		
AGRO 516	Molecular Analysis of Complex Traits	3
PLEN 6110	Arid Land Water Resources	0,3
PLEN 6120	Instrumentation in Agronomy	3
PLEN 6320	Advanced Soil Physics	3
PLEN 6415	Breeding for Plant Disease Resistance	3
PLEN 6420	Advanced Crop Breeding	0,4
ANSC 602	Advanced Reproductive Physiology (fo)	3
ANSC 621	Metabolic Functions and Dysfunctions (fe)	3
BCHE 546	Biochemistry II	3
BCHE 647	Physical Biochemistry	3
BIOL 527	Symbiosis	3
BIOL 536	Advanced Disease Vector Biology	3
BIOL 568	Communities and Ecosystems	3
BIOL 582	Advanced Plant Signalling and Development	3
BIOL 587	Behavioral and Evolutionary Ecology	3
GEOG 542	Programming for GIS	3
GEOG 552	Landscape Ecology	0,4
GEOG 572	Geodatabase Design	3
GEOG 573	Introduction to Remote Sensing	0,4
GEOG 578	Fundamentals of GIS	0,4
GEOG 585	Spatial Analysis and Modeling	3
MOLB 520	Molecular Cell Biology	3
MOLB 545	Molecular and Biochemical Genetics	3
MOLB 542	Biochemistry I	3
RGSC 509	Approaches to Rangeland Research	3
RGSC 513	Advanced Rangeland Ecology	3
RGSC 516	Arid Land Management	3
RGSC 518	Watershed Methods and Management	3
RGSC 520	Arid Land Plant Herbivore Interactions	3

RGSC 575	Climate Studies, Water and Society	3
<i>Additional Coursework for students with only a B.S. degree:</i>		
EPWS 511	Introduction to Weed Science (f)	4
EPWS 502	General Entomology	4
EPWS 551	Special Topics	1-4
EPWS 505	Advanced Integrated Pest Management	3
EPWS 551	Special Topics	1-4
Additional 3 credits from experimental design/statistical analyses.		3

The Road Map, need to be in the standard format for the catalog because this piece of the form will be imported directly onto the catalog page. See the Student Records Website for a guide. All courses and the total number of credits at the bottom of the roadmap should match the Course Requirements list.

### Road Map

Candidates are accepted into the department to work with a specific faculty member that serves as their major advisor and committee chair. They will develop a dissertation committee in collaboration with their advisor that includes at least two other members of the graduate faculty, at least one of which must be from the same department, and a Dean's representative who must come from outside the department. The committee should be established during the second semester of study.

Students will select classes with the help of their major advisor based on background and interests. Students with a M.S. degree are expected to complete their degree in 3-4 years, but may be allowed up to 7 years to complete the requirements if they begin with a B.S.

For students with a M.S. degree, a minimum of 30 credits of graduate course work plus 18 credits of dissertation (7000) is required to graduate. This is 48 credits to graduate. Students with a B.S. degree must have at least an additional 12 credits, for a total of 60 credits beyond the B.S. degree.

Ph.D. students must do the following:

- Complete a minimum of 6 semesters, with at least two occurring after the comprehensive exam.
- Complete a minimum of 30 credits of graduate work plus 18 credits of dissertation (EPWS 7000 Doctoral Dissertation).
- At least 15 credits must be in courses numbered 500 or above.
- At least 15 credits must be from the EPWS program.
- No more than 6 credits of EPWS 6991 Doctoral Research may apply toward graduation.
- At least 3 credits of EPWS 690 Doctoral Seminar.
- Complete a minimum of 9 hours of course work numbered above 600, exclusive of research and dissertation credit.
- Maintain a minimum grade point average of 3.0.
- Complete the degree within 7 years of admission.
- Enroll in at least 1 credit/semester or 9 credits if full time.
  - Full time students may petition to enroll for only 1 credit during their final semester if all other credit requirements have been fulfilled.
- Enroll in seminar classes and present at least 3 seminars.
- Complete annual Student Progress Report.
- Successfully complete a qualifying exam, comprehensive exam, and dissertation defense. (see below)

Ph.D. candidates are recommended to do the following:

- Gain experience as a teaching assistant for at least two semesters.
- Present research at least once in a poster or oral format at a regional, national, or international conference.
- Submit at least one manuscript as first author for publication in a peer-reviewed journal.

### Exams

**Qualifying exam** – Students with a M.S. degree will take the qualifying exam at the end of the first year and after completion of at least 12 course credits. Students with a B.S. degree will take the qualifying exam at the end of the second year and after completion of at least 18 course credits. The qualifying exam will consist of a short proposal or a list of curated questions, and an oral exam in coordination with the students committee. There will be no additional qualifying exam requirements for students with B.S. degrees. If a student does not pass the qualifying exam, they will have the opportunity to continue their research and pursue a M.S. degree. For M.S. degree holding students, note options below.

**Comprehensive exam** – This exam covers all phases of the major and minor fields of study and is given after completion of the agreed-upon course work, and when sufficient progress has been made toward fulfilling agreed upon research goals. The examination must contain both written and oral portions. The written portion may be in the form of a proposal or it may consist of questions presented by individual committee members. The student must satisfy the graduate committee's expectation on the written portion before moving on to the oral portion. If a student does not meet the committee's expectation on the written or oral portion, they may be required to re-take a portion or the entire exam. Students must pass the examination within 36 months of passing the qualifying exam and may not register for 7000 level courses until both parts of the comprehensive have been passed. If a student does not pass the comprehensive exam, they will have the opportunity to continue their research and pursue a M.S. degree. For M.S. degree holding students note options below.

Final dissertation defense – this is taken after completing all other degree requirements. The student will complete 18 credits of doctoral dissertation prior to the defense. There is a minimum of one year between the comprehensive exam and the defense. If a student does not pass the final defense, they may be given the opportunity to convert their dissertation into a thesis and pursue a M.S. degree. For M.S. degree holding students note options below.

Note that for each of the exam stages (i.e., qualifying exam, comprehensive exam, and dissertation defense), when an M.S. degree holding student does not pass they may not be allowed to continue in the program. Such a case will be dealt with on an individual basis with active participation from the graduate dean.

Students should consult the Graduate School website for specific information regarding the completion of the degree and submission of the dissertation.

The admission requirements are needed if the program has a specialized admission process that exceeds the campus requirements for either the Undergraduate or Graduate admission standards.

• For graduate programs, the Graduate School asks for the following information (Provide a summary of the documents and specific information each student will need to provide to be considered for the program): Description, Statement of Purpose/Letter of Interest; Specialty Letter of Interest; Resume; Writing Sample; GRE; GMAT; Special Questions (if yes, what questions need to be answered); Letters of Recommendation (how many are required); NMSU Faculty Representative (if yes, how many); Foreign Language; WES Evaluation; Special License or Verifications (what license/verification)

### **Admission Requirements**

In addition to the requirements of the NMSU graduate school, applicants must have:

- GPA of 3.2/4.0 or above from most recent degree
- A letter of intent describing the applicant's goal for academic and professional development and proposed major advisor.
- Three letters of recommendation from academic or professional sources.

Students without a M.S. degree or equivalent are normally admitted to a M.S. degree program first. After one year, eligible students may apply to be admitted to the Ph.D. program without completion of the M.S. degree. The request for such an admit will be made jointly by the student and their major advisor(s) with endorsement of the student's graduate committee to the Department Head. The request for admittance (through the Graduate School) to Ph.D. program will normally be made after at least one year of M.S. study - when the student's scholastic performance and research potential have been clearly established.

### **Does this program lead to licensure, yes or no?**

No

### **Is credit for prior learning built into the program, if yes explain?**

Students from within EPPWS or other closely related M.S. programs at NMSU may transfer up to 30 credits from their M.S. program into the Ph.D. program, as approved by their major advisor. Students from other programs or from outside of NMSU may transfer up to 9 credits, as approved by their major advisor, and as per Graduate School policy. Regardless of credit transfer, students must meet all other credit and course requirements.

## **Faculty Members Employed to Teach in the Program**

### **Existing Personnel**

Erik A. Lehnhoff

### **FTE**

0.2

### **Course load and courses they will teach in the proposed program**

EPWS 560 Ecology and Management of Invasive Plants  
EPWS 590 Graduate Seminar

### **Courses taught in other programs currently offered**

EPWS 1110G and 1110L Introduction to Applied Biology; EPWS 560 Invasive Plant Ecology and Management

### **Description of academic qualifications**

Ph.D. Montana State University, Ecology and Environmental Science, 2008  
MS, Tennessee Technological University, Civil and Environmental Engineering, 1994

### **Prior instructional responsibility and other experiences relevant to assigned courses**

In addition to the courses currently taught, I have taught numerous related courses. At Montana State University, I taught:  
Introduction to Soil Science Lab  
Sustainable Food and Bioenergy  
Weed Science (and lab)  
Plant Ecology

**For graduate programs, document scholarship and research capability**

Research on agronomic weed control and invasive plant management in arid and semi-arid systems. Twenty four peer reviewed publications in the past 5 years.

**For doctoral programs, document faculty experience in directing student research**

Advisor to 2 PhD students and 7 MS students since 2016. Served as committee member on numerous other PhD and MS committees.

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**Existing Personnel**

Scott Bundy

**FTE**

0.2

**Course load and courses they will teach in the proposed program**

EPWS 640 Tropical Insect Ecology

**Courses taught in other programs currently offered**

EPWS 302/502 General Entomology; EPWS 325V Insects, Humans, and the Environment; EPWS 440 Tropical Insect Ecology

**Description of academic qualifications**

Ph.D. University of Georgia, Entomology, 1999

M.S. Southern Illinois University, Zoology, 1996

B.S. Southern Illinois University, Biological Sciences, 1993

**Prior instructional responsibility and other experiences relevant to assigned courses**

In addition to the classes I currently teach, I previously taught the following courses at NMSU:

Advanced Integrated Pest Management

Advanced Insect Morphology and Taxonomy

Economic Entomology (and Lab)

Introduction to Pest Management (and Lab)

Departmental Seminar

Special Problems in Entomology

**For graduate programs, document scholarship and research capability**

My research foci are 1) the bionomics and morphology of the Heteroptera and other insect taxa, and 2) the integrated pest management of arthropods impacting field crops in New Mexico. I have nearly 40 peer reviewed articles and 9 published book chapters or monographs.

**For doctoral programs, document faculty experience in directing student research**

Advisor or Co-advisor to 3 MS students in the last 4 years. Served as committee member on numerous Ph.D. and M.S. committees.

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**Existing Personnel**

Joanie King

**FTE**

0.2

**Course load and courses they will teach in the proposed program**

N/A - Extension Research appointment

**Courses taught in other programs currently offered**

N/A

**Description of academic qualifications**

Ph.D., Entomology, Texas A&M University, 2022. M.Sc., Entomology, University of Georgia, 2017. B.Sc., Biology, University of Central Florida, 2013.

**Prior instructional responsibility and other experiences relevant to assigned courses**

Fall 2017 - Fall 2022 Graduate Research Assistant, Department of Entomology, Texas A&M University, College Station, TX

Summer 2015 - Summer 2017 Graduate Teaching Assistant, Department of Entomology, University of Georgia, Athens, GA

Fall 2014 - Spring 2015 Graduate Teaching Assistant, Department of Biology, University of Georgia, Athens, GA  
 May 2017 Lead Graduate Teaching Assistant for Animals and Insects of Ecuador and the Galapagos Islands. Department of Entomology, University of Georgia

**For graduate programs, document scholarship and research capability**

Research in entomology. 5 peer reviewed publications in the past 5 years.

**For doctoral programs, document faculty experience in directing student research**

Adviser to 1 MSc student. Serving as a committee member to 2 MSc students.

**Existing Personnel**

Abdur Rashid

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

Will supervise students enrolled in Ph.D. programs in the following areas: Weed, plant, and herbicide physiology; Plant molecular biology/genetics.

**Courses taught in other programs currently offered**

Introductory plant biology, Plant breeding.

**Description of academic qualifications**

Ph.D. University of Alberta, Edmonton, Alberta, Canada, Plant biology, 2010; Ph.D. Jozsef Attila University, Szeged, Hungary, Plant Physiology, 1984.

**Prior instructional responsibility and other experiences relevant to assigned courses**

Taught different courses in botany at the University of Chittagong, Chittagong, Bangladesh.

**For graduate programs, document scholarship and research capability**

Published 46 articles in high quality journals in the field of plant physiology; plant molecular biology; weed science.

**For doctoral programs, document faculty experience in directing student research**

Served as a committee member of a Ph.D. student at the NMSU.

**Existing Personnel**

Brian Schutte

**FTE**

0.2

**Course load and courses they will teach in the proposed program**

EPWS 525 Scientific Writing, EPWS 511 Weed Science, EPWS 514 Plant Physiology

**Courses taught in other programs currently offered**

EPWS/AGRO 311 Introduction to Weed Science, EPWS/BIOL 314 Plant Physiology

**Description of academic qualifications**

Ph.D., Horticulture and Crop Science, The Ohio State University, 2007  
 M.S., Horticulture and Crop Science, The Ohio State University, 2002  
 B.A., Botany, B.A., Political Science, Miami University, 1999

**Prior instructional responsibility and other experiences relevant to assigned courses**

Previous courses taught at New Mexico State University include EPWS 200 Weeds and Society and EPWS 100L Introduction to Pest Management Laboratory.

Co-instructor for CPSC 418 Crop Physiology at the University of Illinois

Teaching fellow in the NSF Faculty Institute for Reforming Science Teaching from 2011-2013

**For graduate programs, document scholarship and research capability**

25 peer-reviewed publications from 2019 through 2024.

64 peer-reviewed publications in total

**For doctoral programs, document faculty experience in directing student research**

Advisor to 3 PhD students and 8 MS students since 2012. In addition, served on graduate committees for 12 PhD students, 32 MS students

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**Existing Personnel**

Jane Pierce

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

Possibly IPM or economic entomology

**Courses taught in other programs currently offered**

N/A

**Description of academic qualifications**

MS Texas A & M University – Entomology

**Prior instructional responsibility and other experiences relevant to assigned courses**

Agriculture and the Environment Rutgers University  
TA Economic Entomology Texas A & M University

**For graduate programs, document scholarship and research capability**

1311 Citations of 78 research papers. Current research on integrated pest management of insect pests in NM, fungal endophytes in turn grasses and Kissing bugs that vector Chagas disease. Emphasis on biological control and host plant resistance and impact of microclimate on insect pests and beneficials.

**For doctoral programs, document faculty experience in directing student research**

Advisor to 2 M.S. students in last 10 years, numerous committees and one post doc.

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**Existing Personnel**

Soum Sanogo

**FTE**

0.3

**Course load and courses they will teach in the proposed program**

EPWS 492 Diagnosing Plant Disorders  
EPWS 373/573 Fungal Biology

**Courses taught in other programs currently offered**

EPWS 1110 Introduction to Applied Biology EPWS 505 Advanced Integrated Pest Management EPWS 506 Biological Control EPWS 481 Nematology

**Description of academic qualifications**

PhD The Pennsylvania State University, Plant Pathology, 1995

**Prior instructional responsibility and other experiences relevant to assigned courses**

Co-Instructor for Plant Health Biology, Iowa State University  
Teaching Assistant, Plant Disease Diagnosis, Pennsylvania State University

**For graduate programs, document scholarship and research capability**

Research focuses on foliar and soilborne diseases of field crops, ornamentals, fruit, and vegetables, with over 20 years working on research projects in the area of plant health in Pennsylvania, Connecticut, Iowa, Maryland, Brazil, Philippines, and New Mexico. Twenty-eight peer-reviewed publications in the past 5 years.

**For doctoral programs, document faculty experience in directing student research**

Co-advisor to 3 PhD students. Member of more than 20 PhD committees.

**Existing Personnel**

Rebecca Creamer

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

EPWS 690 Doctoral Seminar  
EPWS 6991 Doctoral Research  
EPWS 6996 Advanced Topics

**Courses taught in other programs currently offered**

EPWS 310 and 310H – Plant Pathology; EPWS 486 – Plant Virology; EPWS 455 and 505 – Advanced Integrated Pest Management

**Description of academic qualifications**

Ph.D. Plant Pathology, University of California, Davis

**Prior instructional responsibility and other experiences relevant to assigned courses**

Previously taught classes in Plant Disease Epidemiology, Graduate seminar in plant Pathology, Plant Virology, Virus/Insect Vector Interactions.

**For graduate programs, document scholarship and research capability**

Published more than 63 papers and 7 book chapters in the past 23 years. Manage three multistate projects.

**For doctoral programs, document faculty experience in directing student research**

Have graduated 14 Ph.D. students and 10 M.S. students. Currently advising 2 Ph.D. students. Served on many graduate committees. Member (and former director) of the Molecular Biology and Life Sciences graduate program.

**Existing Personnel**

Steve Hanson

**FTE**

0.4

**Course load and courses they will teach in the proposed program**

EPWS-549, 551

**Courses taught in other programs currently offered**

Previously taught MolBio grad courses, MOLB 545 and others

**Description of academic qualifications**

Ph.D. UW-Madison

NMSU faculty member since 2003 (EPPWS and Mol Bio Program)  
Current rank = Associate Professor.

NMSU Grad Faculty status = Restricted

**Prior instructional responsibility and other experiences relevant to assigned courses**

N/A

**For graduate programs, document scholarship and research capability**

Recognized expert in biotechnology, GMO food issues, biocontrol of plant diseases, plant virology and plant pathology.

**For doctoral programs, document faculty experience in directing student research**

Successfully graduated 3 Ph.D. students  
Served on committees for 20+ Ph.D. students in Mol Bio program.

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**Existing Personnel**

Ricardo Ramirez

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

EPWS 6991 Doctoral Research  
EPWS 6996 Advanced Topics  
EPWS 7000 Dissertation Research  
EPWS 506 Biological Control

**Courses taught in other programs currently offered**

N/A

**Description of academic qualifications**

Ph.D. Washington State University, Entomology, 2008

**Prior instructional responsibility and other experiences relevant to assigned courses**

Currently a major advisor for 2 Ph.D. students and 1 master's student. Prior to NMSU, graduated 5 and 6 Ph.D. and M.S. students, respectively as major advisor and supervised post-doctoral research associates at Utah State University.

**For graduate programs, document scholarship and research capability**

Research focused on agroecology and integrated pest management. Assessing the impacts of climate change on insect outbreaks and on the conservation of beneficial insects. Developing tools to improve pest suppression and the use of alternative management strategies. Forty-six peer reviewed publications.

**For doctoral programs, document faculty experience in directing student research**

Over 15 years of experience with directing graduate and undergraduate students through grant and contract funded support. Twenty-seven peer-reviewed articles with graduate and undergraduate co-authors and nearly all graduate students having at least one peer-reviewed article. Effective leadership in research and extension programming and budget management

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**Existing Personnel**

Gerald Sims

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

EPWS 520 Environmental Behavior of Pesticides  
Other courses currently taught:  
EPWS 420 Environmental Behavior of Pesticides

**Courses taught in other programs currently offered**

New Mexico State University –Applied Biology EPWS 100 (now EPWS 1110G), Internship (EPWS 390). University of Illinois - ACES Freshman Discovery, Graduate Group Studies, Graduate Seminar (NRES Dept.), Graduate Seminar (CRPS Dept.), Special Problems, Soil Microbiology, Senior Thesis in Microbiology, Special Problems in Microbiology. Ohio State University - Environmental Microbiology, Soil Microbiology, Anaerobic Processes in Soils, Graduate Seminar, Graduate Colloquium, Undergraduate Colloquium.

**Description of academic qualifications**

B.S., McNeese State University, 1978; M.S., Louisiana State University, 1981; Ph.D., Purdue University, 1985; Mediator Training, Dept. Health and Human Services, 1994; Congressional Briefing, Georgetown University, 2004; Leadership Laboratory, Growth Dynamics, 2005; Advancing Leaders, NMSU, 2014; Lead21, 2015.

**Prior instructional responsibility and other experiences relevant to assigned courses**

Research on environmental microbiology, microbial ecology; > 100 peer reviewed publications; > 6,000 citations (H index = 40); 4 type strains.

**For graduate programs, document scholarship and research capability**

Advisor to >30 graduate students, of which 15 serve either as university faculty (including one physician) or lead PIs at national labs; advisor to 6 postdoctoral fellows (5 of which serve as university faculty). Mentored ~ 6 junior faculty (including one elected to NAS and one fellow of AAAS). Oversight of graduate program (as department head) 11 years.

**For doctoral programs, document faculty experience in directing student research**

N/A

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**Existing Personnel**

Jennifer Randall

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

EPPWS 447/590 (Seminar)  
EPPWS 591 (Special topic Grant writing)  
EPPWS 448 Special topics in Molecular Biology  
EPPWS 451 Special topics in Molecular Biology tools for Agriculture Biology  
EPPWS 550 Special topics in Genomics  
EPPWS 599 Thesis

**Courses taught in other programs currently offered**

GENE 110 (Experimental systems in genetics) MOLB 590 (Molecular Biology Seminar) MOLB 545 (Molecular and Biochemical Genetics) MOLB 550 Special topics in microscopy MOLB 550 Special topics in Bioinformatics MOLB 550 Special topics in Grant Writing MOLB 597 Molecular Biology Rotation MOLB 599 MS Thesis Research MOLB 600 Thesis Research MOLB 700 Doctoral dissertation Research

**Description of academic qualifications**

Ph.D. Molecular Biology—NMSU 2005  
M.S. Molecular Biology  
B.S. Biochemistry

**Prior instructional responsibility and other experiences relevant to assigned courses**

In 2010-2011 she taught Plant Physiology (EPPWS 314/514); Scientific Ethics for the RISE program, and has guest lectured for numerous courses.

**For graduate programs, document scholarship and research capability**

Dr. Randall's research program focuses on plant genetics, plant development, plant diseases, and plant microbe interactions and is nationally and internationally recognized. She has mentored numerous Ph.D. students, M.S. students, and more than 30 undergraduate students in research. Dr. Randall is a patent holder and has published more than 40 peer reviewed manuscripts and secured nearly 17 million dollars in grants and contracts for research. She serves on USDA grant panels and routinely serves as an ad-hoc reviewer for multiple journals. She has been recognized by NMSU for research excellence.

2013 Research Excellence Award—New Mexico State University  
2015 Research Excellence Award—New Mexico State University  
2017 Research Discovery Award—New Mexico State University  
2017 Plant Health Response Team Award  
2019 Inducted into Aztec Hall of Honor  
2020 Outstanding Alumni Award (ACES), New Mexico State University  
2021 Invited Plenary Presentation at Research and Creativity Week  
2023 Recognized as 'Woman Inventor' NMSU Panorama  
2024 NMSU faculty nomination for CUSA faculty of the year award

**For doctoral programs, document faculty experience in directing student research**

Dr. Randall is a Professor in EPPWS and is the current Director of the Molecular Biology and Interdisciplinary Life Sciences (MBIL) Graduate Program at NMSU. In addition, to being director she also is the academic advisor for the MBIL graduate student organization. She also holds affiliate status at Texas A&M University, and the University of Georgia as she serves on graduate committees for students in other universities.

**PROFESSIONAL EXPERIENCE**

2021 - Professor, New Mexico State University  
Director of Molecular Biology and Interdisciplinary Life Sciences Graduate Program  
2019 – 2021 Research Professor, New Mexico State University  
Director of Molecular Biology Graduate Program

2012 – 2019 Research Associate Professor, New Mexico State University

2005 – 2012 Agriculture Research Scientist and Graduate Faculty Professor, EPPWS and Molecular Biology, NMSU

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**Existing Personnel**

Abdel O. Mesbah

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

None

**Courses taught in other programs currently offered**

EPWS 599 Master's Thesis.

**Description of academic qualifications**

Ph.D. Agronomy/Weed Science and Technology, University of Wyoming, December 1993. M.S. Agronomy/Seed Science and Technology, University of Wyoming, May 1990. B.S. Crop Sciences: Ecole Nationale D'Agriculture at Mekness, Morocco, July 1982. Previous experience as research faculty at the University of Wyoming (15 years)

**Prior instructional responsibility and other experiences relevant to assigned courses**

Crop-4790, Seed Science and Technology (fundamental principles of seed production, processing, and marketing). Upper division/graduate course, 3 credits, offered biennially through the University of Wyoming-Department of Plant Sciences and Northwest College 3rd Year Agroecology Program). 2000-2002

**For graduate programs, document scholarship and research capability**

Has directed research on variety testing to evaluate performance (yield and quality) of agronomic, horticultural, and alternative crops. Developed sustainable weed management systems involving cultural practices, tillage, and herbicides for agronomic, horticultural, alternative, and selected pulse crops. Graduate advising experience: Has prior experience as Research Leader, Powell Research & Extension Center, University of Wyoming and Director Powell Research & Extension Center, University of Wyoming. Has published 20 peer-reviewed journal articles and 10 extension publications.

**For doctoral programs, document faculty experience in directing student research**

Advisor to >9 graduate students (6 M.S. and 2 Ph.D.) at University of Wyoming and New Mexico State University. Has served on Graduate Admission Committee, EPPWS, NMSU.

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**Existing Personnel**

Leslie Beck

**FTE**

0.1

**Course load and courses they will teach in the proposed program**

N/A - Extension Research appointment

**Courses taught in other programs currently offered**

N/A

**Description of academic qualifications**

Ph.D. Texas Tech University, Plant and Soil Science, 2012  
M.S., Tarleton State University, Agriculture, 2009

**Prior instructional responsibility and other experiences relevant to assigned courses**

N/A - Extension Plant Science

**For graduate programs, document scholarship and research capability**

Experience with experimental design and greenhouse/field research projects. Numerous publications in peer-reviewed journals.

**For doctoral programs, document faculty experience in directing student research**

Served on committees of numerous M.S. students in EPPWS.

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**Existing Personnel**

Kristen Bowers

**FTE**

0.15

**Course load and courses they will teach in the proposed program**

EPWS 551 Special Topics, EPWS 599 Thesis/Dissertation Credit, EPWS 590 Seminar

**Courses taught in other programs currently offered**

EPWS 110G and 1110 L Introduction to Applied Biology, Biological Control, EPWS 303 Economic Entomology

**Description of academic qualifications**

Ph.D. University of Florida Department of Entomology and Nematology, 2021

**Prior instructional responsibility and other experiences relevant to assigned courses**

Guest lectures on biological control.

**For graduate programs, document scholarship and research capability**

Research topics include classical biological control of weeds, conservation biological control in agricultural and natural ecosystems, economics of biological control.

**For doctoral programs, document faculty experience in directing student research**

Graduate Faculty status, able to chair graduate committees.

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**Documentation of department faculty support**

DH letter of support for EPPWS PhD program.pdf  
EPPWS Faculty Support.pdf

**Curriculum Committee Approval**

Curriculum committee memo.pdf  
Curriculum Committee ACES-Applied and Agricultural Biology PhD support memo.pdf

**Gray Associates Data**

Grays\_26 0305-2024-phd.pdf

**NM Higher Education Department****Describe your institution's plan for periodic evaluation of program effectiveness. Include criteria that will be used to determine effectiveness.**

Program effectiveness will be determined based on retention, time-to-degree, placement of students completing the program, research products, documented impact of the research, and completion of student learning outcomes assessments. Evaluation will take place 5 years after program inception and then every three years afterward. Data will be accumulated on a running 3-year basis.

**The proposed program must meet one or more specified needs within the state or region. Clear and convincing evidence must be provided of the reality and extent of such need.**

To support a rising population, agricultural productivity must increase 50-70% over 25 years, a goal made especially challenging by new pest and disease outbreaks. State, regional, and national needs exist for expertise to respond to these issues. Over 40% of the food supply is lost to pests and disease pre-harvest (Savary et al. 2019), and 8-70% of the remainder is lost post-harvest (Mason 2003). Federal agencies report a shortage of the required expertise at the national level (AFRI Education and Workforce Development Program). Letters of support from federal agencies speak to the need for trained professionals in the disciplines housed in our department (Entomology, Plant Pathology, and Weed Science). USDA-ARS (see USDA ARS-Dr. Joseph Rich) reported 469 related PhD-level positions in our region and 2,336 nationally with 20% of the workforce eligible to retire. The USDA-Forest Service described a need for Ph.D. scientists in these disciplines to support forestry (see USDA Forest Service-Rick Cooksey). Owing to short supply of qualified applicants, the Centers for Disease Control is severely understaffed in entomology, necessitating recruitment of temporary assistance from academic scientists to handle its Zika response (Sifferlin 2018).

The proposed program supports Sustainable and Value-Added Agriculture, one of New Mexico's nine economic priority sectors. In addition to training a workforce for this sector, the program supports our agricultural economy through research in each student's dissertation. Such research will address protection from harmful organisms that decrease crop yields or negatively impact

rangelands; support human health and environment (including pollinator health); provide alternatives to synthetic pesticides. Potential positive impact on New Mexico growers is significant. Chile producers face up to 100% crop loss to soil-borne disease and \$34M lost profit to weeds. Tree nut producers also need new tools, such as an invention to detect aflatoxin, saving processing costs. As invasive pests, like pecan weevil, expand their ranges, demand will increase for trained personnel to meet these challenges.

EPPWS' multidisciplinary composition allows us to address issues single-discipline departments cannot. Interactions in life cycles of insects, weeds, animals, and pathogens form pest/disease complexes in which arthropods transmit diseases from wildlife to domestic animals (and humans) or from weeds to crops. Few universities are structured to promote collaboration among disciplines that study these complexes. The attached report entitled "Survey of Western Graduate Programs", reveals these disciplines are usually housed in separate departments. New Mexico State University and Colorado State University are the only Land Grant universities housing entomology, plant pathology, and weed science in the same department. As the CSU program doesn't integrate disciplines at the Ph.D. level, the proposed program will be unique in cross-training PhD students for the pest and disease challenges we face in the future.

#### References:

Mason, L. 2003. Insects and Mites. In Food Plant Sanitation; Hui, Y.H., et al., Eds.; Marcel Dekker, New York, NY, USA; pp. 293–316.

Savary, S., et al. 2019. The global burden of pathogens and pests on major food crops. *Nature Ecology & Evolution*. 10.1038/s41559-018-0793-y, doi:10.1038/s41559-018-0793-y.

Link to Sifferlin article:

<https://time.com/5144257/fewer-scientists-studying-insects-entomology/>

#### **If the program fills a regional workforce need, describe collaboration between your institution and regional employers in the program development.**

The proposed Ph.D. program certainly fills a regional workforce need, and we have had numerous conversations with regional stakeholders and potential employers (see letters of support). Chemical (i.e., insecticide, fungicide, nematicide and herbicide) development companies hire Ph.D. scientists as product development managers and need a pipeline of Ph.D.'s for their continued growth. Similarly agricultural consulting companies often rely on Ph.D.'s for providing expert advice and recommendations for growers. Regional specialty crop organizations such as the Western Pecan Grower's Association have stated they need a Ph.D. program focusing on understanding pest management issues in New Mexico and the western region. Also, locally and within the broader region, stakeholders such as the USDA Agricultural Research Service (ARS) have noted the demand for Ph.D. scientists trained in areas of entomology, plant pathology and weed science. The USDA ARS Jornada Experimental Range supports 20 permanent Ph.D. scientists, but these positions are generally filled from outside of New Mexico because of lack of qualified local candidates. Our program could help fill this void. Likewise, our Ph.D. program could contribute to filling 93 Ph.D. level agricultural science position vacancies within the regional USDA ARS system.

In addition to filling workforce needs after graduation, the role of Ph.D. students during their studies within EPPWS should be noted. Students will spend on average 4-5 years completing their degrees. During this time, they will often work with local and regional stakeholders on pressing issues within their disciplines, providing critical information for the agricultural sector and the people of New Mexico. Thus, even if graduates move out of the region, as is common for Ph.D.'s who seek employment on the national or international market, they will provide a tremendous benefit during their research tenure at NMSU.

#### **Identify where similar degree programs are offered by other public higher education institutions in New Mexico.**

There are no similar degree programs in New Mexico.

#### **If similar programs are offered at other public higher education institutions in New Mexico, provide a rationale for offering an additional program.**

N/A

#### **Enrollment and Graduation Projections**

Student Type	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	2	2	2	2	2
Continuing Students	0	2	4	6	6
Graduates	0	0	0	0	2

#### **Annual Retention Rate Target (%)**

100

#### **Target 100% Graduation Rate (%)**

100

#### **Target Job Placement Rate (%)**

100

**Describe the faculty resources that are needed to initiate the program. Will any additional faculty be needed?**

We will not require additional faculty resources. The necessary faculty are on-board to support the program. The curriculum for the bulk of the program is based on existing courses from the M.S. program and existing courses in other units. Research and dissertation courses will be handled by student advisors. A redistribution of workload will allow the rest of the Ph.D.-level courses to be taught by available faculty. The faculty identified above will provide guidance and pursue funding to support doctoral students in the program. The faculty in the department are established investigators with a track record of securing extramural funding. Currently, faculty in the department have secured \$661,333 per research FTE (6.9 total) of grants in force with \$875,568 per research FTE in new awards in the past year.

Grant funding comes from diverse sources, with USDA-NIFA (United States Department of Agriculture – National Institute of Food and Agriculture) contributing the largest dollar amount. A partial list of current funding sources includes:

National Science Foundation (NSF)

USDA-NIFA

USDA-NRCS (National Resources Conservation Service)

Research Foundation-Flanders (Belgium)

International Arid Lands Consortium

Weed Science Society of America

New Mexico Chile Association

Southwestern Integrated Pest Management

NMDA (New Mexico Department of Agriculture)

Texas A&M

University of Florida

University of California

University of Energy and Natural Resources (Ghana)

NMSU-CESFAS (Center of Excellence in Sustainable Food and Agricultural Systems)

NMSU-AES (Agricultural Experiment Station)

Industry partners

**Describe the library and other academic support resources that are needed to initiate the program. What, if any, additional resources will be needed?**

The library provides adequate support for the initial needs of this program. The library provides access to the Digital Library, which supports many journals in multiple disciplines of the department and Applied and Agricultural Biology program. No additional resources are needed. The library has prepared a report in response to the College of Agricultural, Consumer, and Environmental Sciences' new program proposal for a PhD in Applied and Agricultural Biology in the Department of Entomology, Plant Pathology, and Weed Science. This report assesses the Library's ability to support the program (see attached Library Report). We will continue to work with the library to identify essential resources needed to support the Ph.D. program in subsequent years.

**Describe the physical facilities of the institution that will be used for the first five years of the program. Will additional space or modifications of existing space be required within the first five years of program operation.**

The facilities available to the department are adequate to support the proposed Ph.D. program. No additional facilities are needed for this program. The facilities offer training for students at the graduate and undergraduate levels for careers in entomology, plant pathology, weed science and related fields. The following is a specific breakdown of facilities:

-two teaching laboratories (Skeen W129, W139) and adjacent prep rooms (W131, W135)

-multiple classrooms for lecture (Skeen Hall, Gerald Thomas Hall, Hardman Jacobs Learning Center, etc.)

-Quarantine and Nematode Containment Facility (Skeen W159)

-NMSU Arthropod Collection (Skeen W168)

-Skeen Hall Teaching Greenhouses

-Watts Laboratory

-Nematology Building has an autoclave, -80 C freezer, and deep freezers for cold storage, chemical assay lab with fume hood, and field supplies and tools.

-EPPWS Weed Science Field Laboratory (Leyendecker PSC)

Describe the institution's equipment and technological resources needed for the first five years of the program? What, if any, additional equipment will be needed?

The program has no immediate needs for additional equipment.

Existing equipment available for the program includes teaching dissecting and compound microscopes, fume hoods, centrifuges, bio-safety cabinets, autoclaves, etc.

The Quarantine and Nematode Facility has a dedicated plant tissue culture facility and greenhouses for plant cultivation, semi-automated elutriator, mist chamber, incubators, laminar flow hood, gel rigs, etc. The Arthropod Collection has an extensive entomology teaching collection (several thousand specimens) and a Leica M205C Imaging System. The department also has a large teaching collection of preserved plant pathogen specimens and a teaching weed herbarium and access to multiple greenhouses. The Watts laboratory is equipped with dissecting microscopes, incubators, gas chromatography/mass spectrometry with electroantennographic detection and extensive entomological laboratory and field collection supplies. The Nematology Building has an autoclave, -80 C freezer, and deep freezers for cold storage, chemical assay lab with fume hood, semi-automatic elutriator, mist chamber (currently under construction), 14 C incubator, low-speed floor centrifuge, an array of specialized sieves for extracting nematodes, inverted compound microscope with digital camera, pressure chamber, drying ovens, desiccators, and field supplies and soil sampling tools. The Weed Science Field Laboratory has plant drying ovens, greenhouse facilities, field collecting equipment, etc.

**Other resources:**

Microscopic Imaging Core Suite (MICS) located in Skeen Hall is available for use by the Ph.D. program and includes a TCS SP5 II confocal microscope, a H-7650 transmission electron microscope (TEM), a TM 1000 tabletop scanning electron microscope (SEM), a S-3400NII SEM, a FastScan TM atomic force microscope, and a Leica M165FC Fluorescence Stereomicroscope. In addition, there is a sequencing facility with an ABI 3100 for sanger sequencing or marker analyses, quantitative real time thermocyclers, Bio-AFM, and an instrumentation core facility with analytical instrumentation such as Mass Spectrometers, HPLC, LC-MS, etc. Access to field facilities at NMSU Agricultural Science Centers (e.g., Leyendecker PSC) including hundreds of field acres for experiments, a soils laboratory, etc.

**Describe the institution's equipment and technological resources needed for the first five years of the program? What, if any, additional equipment will be needed?**

No additional equipment or technological resources needed.

**Describe any other operating resources needed to initiate the program.**

None

**Are there existing external facilities that will be used? Have agreements been established to ensure use of the those facilities?**

None

**Provide a clear analysis of the projected cost of the proposed program and the sources of funding that will support it for the first five years that the program will be offered. Include a discussion how any of the needed resources discussed in your attachment. This should be completed in collaboration with your institution's financial office.**

Summary of Costs and Benefits.pdf

**Letters of Support**

Biology Dept NMSU - Dr Charles Shuster.pdf  
Western Pecan Growers Assoc - John White.pdf  
Valent USA - Dr Kenneth Seebold.docx  
USDA NIFA AFRI - Dr Ray Ali.pdf  
USDA Forest Service - Rick Cooksey.docx  
USDA ARS Jornada Exp Range - Dr Brandon Bestelmeyer.pdf  
USDA ARS - Dr Joseph Rich.pdf  
Plant and Environ Sci ACES NMSU - Dr Islam.pdf  
Montana State Univ - Dr Tracy Sterling.pdf  
Marathon Consulting - Dr Phil Banks.pdf  
Library Impact Statement Entomology Plant Pathology and Weed Science.pdf  
FWCE Dept NMSU - Dr Martha Desmond.pdf  
Entomological Society of America - Dr Jennifer Henke.pdf  
Cooperative Extension NMSU - Dr Jon Boren.pdf  
Graduate School Letter of Support.pdf  
Colorado State U Dept Ag Biology - Dr Charkowski.docx  
NMDA Jeff Witte.pdf  
NMSU Animal and Range Science Dept - Dr Shanna Ivey.pdf  
ACES NMSU Dean Rolando Flores.pdf

**Accreditation**

**Is the program seeking specialized accreditation?**

No

**Is specialized accreditation required for licensure or practice in the program?**

No

**Has the program already obtained the appropriate specialized accreditation? If so, attach a copy of the letter from the agency granting accreditation?**

No

**If the program has not yet obtained accreditation but has begun the process of seeking or plans to seek specialized accreditation, specify the name of the agency and provide the time-line for completing the process.**

N/A

**If the program does not plan to seek specialized accreditation, provide a rational for not-seeking accreditation here. (if there is not a specialized accrediting organization for this program, indicate so as your rationale).**

There is no accrediting organization for this program.

**If the program includes any of the following, explain how it will ensure that student work and levels of knowledge competencies achieved will be comparable to those achieved through traditional formats: (Award credit for prior learning; use of compressed time frames; use of on-line deliver; inclusion of accelerated formats; or other approaches to learning.)**

Students may transfer up to 30 credits from their M.S. program into the Ph.D. program, as approved by their major advisor. Otherwise, there will be no compressed time frames and no on-line content delivery.

**Will the program be part of a contractual or consortial arrangement (yes/no, explain)?**

No

**If the program is planning any involvement by external organizations (other than from accredited higher education institutions) in the key operations as identified below, provide the information as requested.**

Type of Involvement	Name of External Organization	Percent of Involvement
Direct instruction and oversight	n/a	n/a

**Briefly describe the planning process for determining the need for this new program, including the role of faculty in the planning and approval process.**

The need for a Ph.D. program in our department has long been recognized. In the fall of 2019, EPPWS underwent an external review. One of the recommendations from that review was that the department should have a Ph.D. program. All faculty agreed to this need (see letter of support) and have had input in the planning process.

**Describe the process for assessing and improving student learning in the proposed program.**

Program effectiveness will be determined based on retention, time-to-degree, placement of students completing the program, research products, documented impact of the research, and completion of student learning outcomes assessments. Evaluation will take place 5 years after program inception and then every three years afterward. Data will be accumulated on a running 3-year basis.

**Describe the process for assessing and improving student persistence and completion, in the new program.**

Retention will be tracked annually. All students in the program will be provided with advising and mentoring on a regular basis by their committee chair. This regular communication will ensure a clear path to completion including coursework and research.

**If any of the institution's accreditation relationship (including other regional, specialized, or national accrediting agencies) are currently under or recommended for a negative status or action (e.g., withdrawal, probation, sanction, warning, show-cause, etc.)**

N/A

**If the institution is undergoing or facing substantial monitoring, special review or financial restrictions from the U.S. Department of Education or other federal or state government agencies.**

N/A

**If the institution's senior leadership or board membership has experienced substantial resignations or removals in the past year.**

Our College leadership has been stable, including the Dean and Academic Dean. NMSU currently has an interim Provost and is conducting a search for a new President.

**If the institution is experiencing financial difficulty through conditions, such as, a currently declared state of exigency, a deficit of 10% or more, a default or failure to make payroll during the past year, or consecutive deficits in the two most recent years.**

N/A

## **Institution Specific Information Area**

**Primary target audience for the program (e.g., full#time, part#time, traditional college age, working adults, transfer students, military personnel, or particular ethnic group)**

The target audience will be students who have recently graduated with a B.S. or M.S. degrees in agricultural sciences, biology, entomology, ecology, plant pathology, weed science, or a related discipline. Non-traditional students already employed in these areas, and wanting to advance in their fields, will also be recruited.

**How does the proposed program align with the department, college and university mission?**

The proposed Ph.D. program will support the strategic goals outlined in NMSU LEADS 2025. In particular:

GOAL 1: Enhance student success and social mobility

Objective 1.1- Diversify, optimize, and increase system-wide enrollment by differentiating and targeting recruitment, marketing and pricing strategies.

NMSU LEADS 1.1.1: As highlighted in the proposed Ph.D. program proposal, the program will be accessible to diverse audiences, including underserved populations in New Mexico. Grant proposals will be submitted for funding to support underrepresented students. Our department currently leads a USDA HSI ENHANCEMENT supporting diverse students.

**GOAL 2: Elevate research & creativity**

**Objective 2.3- Amplify impact of research findings by addressing local needs that align with global challenges.**

NMSU LEADS 2.3.1: The proposed Ph.D. program will develop a research program in sustainable agriculture to serve as drivers for economic development throughout New Mexico.

NMSU LEADS 2.3.3: The proposed program will promote student and faculty connections with universities like Universidad Autonoma de Chihuahua, Ciudad Juarez that currently have an MOU with faculty in the department. The collaboration will result in co-authored publications and grant proposals.

NMSU LEADS 2.3.5: The Ph.D. program which is multidisciplinary in nature provides the opportunity to work interdisciplinary with other departments in the Colleges of ACES, Engineering, and Art and Sciences. The Ph.D. program students and faculty will also work with other national and international institutions to work on large research grants.

**Objective 2.4- Amplify impact of research on society and the economy and promote international collaboration by accelerating technology and knowledge transfer.**

NMSU LEADS 2.4.3: The faculty in the Ph.D. program have existing collaborations, such as the Dimensions US-China project on heritable plant-fungus symbioses and the Imogene project with the Research Foundation – Flanders in Belgium and collaborations in development with others, such as the project to strengthen food safety research in Ghana and multiple relationships with Mexico. Long-term relationships with scientists in Japan, Vietnam, Belgium, and China are expected to continue into the future. As in the past, faculty will work with other national and international institutions to develop large research and training grants.

The proposed Ph.D. directly supports Food and Fiber Production and Marketing, Environmental Stewardship, two of the four Pillars of ACES. The program also indirectly supports the other two pillars: Water Use and Conservation as it relates to drought impact on pest outbreaks and water-efficient crop technologies connection to pest management; and Family Development and Health of New Mexicans as it relates to urban pest issues such as bed bugs and cockroaches.

**Discuss how admissions criteria and strategies will recruit a diverse student body?**

The proposed admissions criteria are consistent with expectations for successful completion of the doctoral program. The graduate program coordinator and members of the admissions committee will assess the pool of applicants and consider diversity in admission decisions.

**What controls are in place to ensure that the information presented to all constituencies in advertising, brochures, and other communications will be accurate?**

The program leadership will work with the College of ACES to ensure compliance with NMSU's / ACES branding standards and ADA compliance, and all communications will be approved by the Dean's office. NMSU office of Marketing and Communications will also be consulted on brand application guidelines and standards.

**Student Records Office Uploads**

**HLC wants CIP Code information that is currently being offered at both the institutional and degree level for 4-digit and 2-digit CIP codes for all new programs. This information will be provided by the University Student Records office and added to the form during the HED submissions workflow step.**

**Reviewer Comments**

**Donald Conner (deconner) (Mon, 08 Jul 2024 22:32:41 GMT):** Rollback: I have rolled back to the Department to allow them to make needed changes as suggested by the ACES Curriculum Committee.

Key: 1028