Appendix 1 - Faculty and Senior Staff Appointments.

FACULTY AND SENIOR STAFF IN RESEARCH, TEACHING, OR EXTENSION: DEPARTMENT OF PLANT PATHOLOGY (JANUARY 2020)										
			Appointment Split							
NAME	**TITLE**	**9/12 MOS**	**OSU**	**OSU Extension**	**OARDC (Research)**	**OTHER (*)**	**YEARS (**)**	**AREA OF SPECIALTY**	**COURSES TAUGHT (***)**	**LOCATION**
FACULTY - TENURE-TRACK										
M. Soledad Benitez Ponce	Assistant Professor	9	30		70		3	Plant Microbiome, Endophytes, Crop Diversification	5010, 6002.01	Wooster
P. Bonello	Professor	9	30		70		20	Tree Pathology, Microbial Ecology	5110	Columbus
A.E. Dorrance	Professor (Associate Dean and Director, Wooster Campus 01/01/2020)	9 (12)	10	40	50	(100)	23	Soybean Pathology, Host Resistance	5140, 8300.02	Wooster
F. P. Hand	Associate Professor	9	10	50	40		7	Ornamentals, Diagnostics, Epidemiology, IPM	3001, 3002, 5120, 5685	Columbus
M. L. L. Ivey	Assistant Professor	9	10	50	40		4	Fruit Pathology, Fresh Produce Safety	5150	Wooster
J. M. Jacobs	Assistant Professor of Emerging Infectious Disease Ecology	9	25		25	50	2	Plant Pathogen Evolution, Bacteriology, Tropical Plant Pathology	8400	Columbus
L. V. Madden	Distinguished Professor, Plant Protection and Associate Chair	12	23		77		37	Epidemiology, Statistics, Biomathematics	5603, 7002	Wooster
S. A. Miller	CFAES Distinguished Professor	9	10	40	50		29	Vegetable Pathology, Diagnostics, International Development	5685	Wooster
T. K. Mitchell	Professor and Chair	12	33	33	34		13	Fungal Biology, Molecular Genetics	2000, 5050, 6002.02	Columbus
P. A. Paul	Professor	9		40	60		14	Cereal Pathology, Epidemiology	5140	Wooster

F. Qu	Professor	9	10		90		12	Molecular Plant Virology, Plant Resistance	5020	Wooster
J. C. Slot	Associate Professor	9	30		70		7	Fungal Evolutionary Genomics	5040, 5041, 5050, 6002.02	Columbus
C. G. Taylor	Associate Professor	9	10		90		11	Molecular Genetics, Nematology, Commercialization	5030, 6002.02	Wooster
G-L. Wang	Professor	9	30		70		21	Molecular Genetics, Host Resistance	7003.01, 8300.01, 8400	Columbus
Y. Xia	Assistant Professor	9	30		70		5	Host Resistance, Plant-Microbe Interactions	7004, 8400	Columbus
FACULTY - CLINICAL										
M. M. Lewandowski	Assistant Professor Clinical Professional Practice	9	100				5	Teaching, Outreach, Science Communications	1100, 4597, 5604	Columbus

			Appointment Split							
NAME	**TITLE**	**9/12 MOS**	**OSU**	**OSUE**	**OARDC** (Research)	**OTHER (*)**	**YEARS (**)**	**AREA OF SPECIALTY**	**COURSES TAUGHT (***)**	**LOCATION**
ADJUNCT FACULTY										
E. Long	Adjunct Assistant Professor					100	1	Pest Management, Diagnostics, Identification		Purdue University
T. Meulia	Adjunct Associate Professor					100	5	Director of MCIC		OSU Wooster
M. Redinbaugh	Adjunct Professor (Retired USDA)						22	Maize Virology, Host Resistance		USDA Wooster
L. R. Stewart	Adjunct Associate Professor					100	10	Molecular Virology		USDA Wooster
C. Yendrek	Adjunct Assistant Professor					100	1	Crop Physiology		The Scotts Miracle-Gro Co.

COURTESY FACULTY										
D. M. Bisaro	Professor, Molecular Genetics					100	25	Virus Replication, Gene Expression, Pathogenesis		Columbus
J. A. Chatfield	Extension Specialist Agric Nat Resources					100	15	Extension Ornamentals		Wooster
D. M. Mackey	Professor, Horticulture and Crop Science					100	8	Molecular Biology, Plant Pathogen Interactions		Columbus
D. S. Verma	Professor, Molecular Genetics					100	32	Plant Molecular Biology, Stress Signaling		Columbus
SENIOR STAFF										
S. O. Opiyo	Research Scientist (MCIC)					100	10	Molecular Biology (MCIC)		Columbus
J. A. Pierzynski	Program Director, C. Wayne Ellett Plant and Pest Diagnostic Clinic	12		25		75	2	Diagnostics and Extension		Reynoldsburg
J.W. Rimelspach	Program Specialist	12	20	75		5	28	Turf Pathology	5130	Columbus
D. N. Tate	Academic Program Specialist	12	100				2	Academic Programs, Teaching	5603, 6001	Columbus
S. D. Williams	Lecturer	12	100				11	Lecturer	2001	Columbus

EMERITUS FACULTY		
C. R. Curtis	**P. E. Lipps**	
I. W. Deep	**T. L. Niblack**	
M. A. Ellis	**L. H. Rhodes**	
S. G. P. Nameth	**R. M. Riedel**	
D. L. Coplin	**S. A. Slack**	
H. A. J. Hoitink	**R. C. Rowe**	

*Funding from non-Plant Pathology hard sources

**Years in Plant Pathology in current position

***Instructor(s) of Record. Plant Pathology courses are listed in Appendix 12.

Appendix 2 – Proposed Plant-Associated Molecular Mycology position description.

FACULTY POSITION
Plant-Associated Molecular Mycology
Department of Plant Pathology - College of Food, Agricultural, and Environmental Sciences
The Ohio State University

Position Description
Applications are being invited for the position of Plant-Associated Molecular Mycologist in the Department of Plant Pathology (plantpath.osu.edu) in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. This is a 9-month tenure-track position at the Assistant Professor level with responsibilities for Research (60%) and Teaching (40%).

The successful candidate will be expected to develop a strong interdisciplinary, nationally and internationally recognized research program focused on fungi and/or oomycetes that interact with plants. Potential research topics may include, but are not limited to, evolution of fungicide resistance, molecular plant-microbe interactions, population genomics, metagenomics, functional genomics, proteomics, and metabolomics of fungal and/or oomycete pathogens. Programs that use emerging computational and data-analytic approaches are highly desirable. The successful candidate is expected to have a strong commitment to undergraduate and graduate education, will teach/co-teach a course in Plant Pathogenic Fungi, and develop a mycology themed course of broad interest to diverse undergraduate students. This position is designed to interact with and enhance a strong mycology community at Ohio State in support of the new undergraduate Minor in Mycology by developing or participating in courses as appropriate. The incumbent will be expected to seek both internal and external research, extension, or teaching program support funds from government, industry, and other appropriate sources

Qualifications
Candidates must hold a Ph.D. focused on mycology, plant pathology, or other relevant area of biological science. Strong research experience in contemporary areas of fungal and/or oomycete biology or plant-fungus and/or oomycete interactions, an excellent publication record, grant writing experience, and postdoctoral experience are highly desirable. It is expected that the candidate has a strong commitment to undergraduate and graduate education, advising, and training.

Location
Laboratory and office space are located on the Columbus campus. Centralized university services will be available, including nucleic acid sequencing, proteomics, metabolomics, and a supercomputer core for bioinformatics/biocomputing, among others. The Department maintains core instrumentation for fluorescence microscopy, liquid chromatography, mass spectrometry, and qRT-PCR. The incumbent will also have access to facilities and support staff at the Molecular and Cellular Imaging Center at both the Columbus and Wooster facilities.

The Department of Plant Pathology
We consist of faculty, postdoctoral scientists, students, and staff based on the OSU main campus in Columbus and the College's research campus in Wooster. Faculty members conduct and lead nationally and internationally recognized research, extension, education, and development programs in fulfillment of the university's Land Grant mission. We offer B.S. degree programs in Plant Health Management and

Plant Pathology, M.S. and Ph.D. degree programs in Plant Pathology, as well as a professional master's program in Plant Health Management (MPHM). Specializations of the faculty range from genomics and molecular biology to quantitative epidemiology and disease management. We are committed to enhancing an already excellent team of diverse faculty, students, and staff, and promoting positive and inclusive work environments for all individuals. Additional information is available at the department's website, plantpath.osu.edu.

Application Procedure

Review of complete applications will begin on XX XXX, 2020 and continue until a qualified candidate is identified. Qualified persons are requested to submit the following: 1) a letter of application; 2) a complete *Curriculum Vitae* including names, addresses, telephone numbers, and e-mail addresses of three references; 3) a statement of research interests (limit two pages); 4) a statement of teaching and advising philosophy (limit two pages); and 5) a statement of philosophy and approach to building a diverse, inclusive and welcoming environment for faculty, staff and students (limit one page). Submit application materials in one pdf file to Dr. [name], Search Committee Chair, xxx.xx@osu.edu.

Ohio State is committed to establishing a culturally and intellectually diverse environment, encouraging all members of our learning community to reach their full potential. We are responsive to dual-career families and strongly promote work-life balance to support our community members through a suite of institutionalized policies. We are an NSF Advance Institution and a member of the Ohio/Western Pennsylvania/ West Virginia Higher Education Recruitment Consortium.

Appendix 3 – Proposed Soybean Plant Pathologist position description.

FACULTY POSITION

Soybean Plant Pathologist
Department of Plant Pathology - College of Food, Agricultural, and Environmental Sciences
The Ohio State University

Position Description
Applications are invited for the position of Soybean Plant Pathologist in the Department of Plant Pathology (plantpath.osu.edu) in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. This is a 9-month tenure-track appointment at the Assistant or Associate Professor level with responsibilities for Research (40%) Extension (40%) and Teaching (20%) in the area of Soybean Pathology.

The successful candidate will be expected to develop a strong, interdisciplinary, nationally and internationally recognized research program addressing diseases that affect soybeans. They will apply advanced molecular and/or epidemiological techniques to address important diseases relevant to the soybean industry, as well as implement a strong mission-oriented research program to address current grower needs. Programmatic attention to the identification, evaluation, and field adoption of disease-resistant soybean lines is preferred. Experience with modern plant transformation techniques is a plus. Extension programming will emphasize integrated plant health management in cooperation with other department faculty members and the multidisciplinary OSU Extension Agronomy Team. The incumbent is also expected to interact closely with Ohio's soybean industry on projects of mutual interest and seek both internal and external research and extension program support funds from government, industry, and other sources. They are expected to have a strong commitment to undergraduate and graduate education, advising, and training, co-teach Diseases of Field Crops (PLNTPTH 5140), and contribute appropriately to other courses such as Plant Disease Management, and as determined by departmental needs and the candidate's areas of expertise.

Qualifications
Candidates must hold a Ph.D. in plant pathology or related field, have documented experience in conducting laboratory and field research, have strong oral and written communication skills, postdoctoral experience, and be eligible for appointment as a tenure-track assistant professor, or a tenured Associate Professor (if applicable). A strong interest in responding to the needs of Ohio soybean and agricultural clientele is essential.

Location
Laboratory and office space are located on the Columbus or Wooster campus of College of Food, Agricultural and Environmental Sciences. The incumbent will have access to university field research plots at Snyder Farm (Wooster, OH), Waterman Farms (Columbus, OH), the Western Agricultural Research Station (South Charleston, OH),and other field locations around the state. Centralized university services will be available, including nucleic acid sequencing, proteomics, metabolomics, and a supercomputer core for bioinformatics/biocomputing, among others. The Department maintains core instrumentation for fluorescence microscopy, liquid chromatography, mass spectrometry, and qRT-PCR. The incumbent will also have access to facilities and support staff at the Molecular and Cellular Imaging Center at both the Columbus and Wooster facilities.

The Department of Plant Pathology. We consist of faculty, postdoctoral scientists, students, and staff based on the OSU main campus in Columbus and the College's research campus in Wooster. Faculty members conduct and lead nationally and internationally recognized research, extension, education, and development programs in fulfillment of the university's Land Grant mission. We offer B.S. degree programs in Plant Health Management and Plant Pathology, M.S. and Ph.D. degree programs in Plant Pathology, as well as a professional master's program in Plant Health Management (MPHM). Specializations of the faculty range from genomics and molecular biology to quantitative epidemiology and disease management. We are committed to

enhancing an already excellent team of diverse faculty, students, and staff, and promoting positive and inclusive work environments for all individuals. Additional information is available at the department's website, plantpath.osu.edu.

Application Procedure

Review of complete applications will begin on XX XXX, 2020 and continue until a qualified candidate is identified. Qualified persons are requested to submit the following: 1) a letter of application; 2) a complete *Curriculum Vitae* including names, addresses, telephone numbers, and e-mail addresses of three references; 3) a statement of research and extension interests (limit two pages); 4) a statement of teaching and advising philosophy (limit two pages); and 5) a statement of philosophy and approach to building a diverse, inclusive and welcoming environment for faculty, staff and students (limit one page). Submit application materials in one pdf file to Dr. [name], Search Committee Chair, xxx.xx@osu.edu.

Ohio State is committed to establishing a culturally and intellectually diverse environment, encouraging all members of our learning community to reach their full potential. We are responsive to dual-career families and strongly promote work-life balance to support our community members through a suite of institutionalized policies. We are an NSF Advance Institution and a member of the Ohio/Western Pennsylvania/ West Virginia Higher Education Recruitment Consortium.

Appendix 4 - Selected Faculty and Staff Awards and Recognition.

Name	Award
American Association for the Advancement of Science (AAAS) Fellows	- Guo-Liang Wang (2019) - Larry Madden (1991)
Jakob Eriksson Prize and Gold Medal, Swedish Academy of Sciences	- Larry Madden (2008)
Fisher Lecturer, Rothamsted Research	- Larry Madden (2008)
E.C. Stakman Award	- Larry Madden (2005)
Ohio State, University Distinguished Scholar	- Guo-Liang Wang (2019) - Larry Madden (1991)
Ohio State, College of Food, Agricultural, and Environmental Sciences, Distinguished Professor	- Sally A. Miller – Inaugural Class (2020)
Society of Nematology	
Fellow	- Terry Niblack (2012)
Executive Board	- Terry Niblack, President (2004) - Horacio Lopez Nicora (2012-2015) (first student on executive board)
American Phytopathological Society	
Award of Distinction	- Larry Madden (2019)
Presidents (1993-present)	- Sally Miller (2016) - Mike Boehm (2013) - Steve Slack (2001) - Larry Madden (1997) - Randy Rowe (1993)
APS Fellows (1999-present)	- Anne Dorrance (2016) - Guo-Liang Wang (2012) - Sally Miller (2010) - Mike Ellis (2004) - Larry Madden (1999)
Excellence in Extension	- Anne Dorrance (2009)
APS Council – Treasurer	- Steve Slack (2012-2018) - Randy Rowe (2006-2012)
APS Council – Internal Communications Officer	- Pierce A. Paul (2017-2018)
APS Distinguished Service Award	- Randy Rowe (2012)
APS North Central Division, president	- Anne Dorrance (2011-2012)
APS North Central Division, Distinguished Service Award -	- Anne Dorrance (2012)
Syngenta Award	- Pierce A. Paul (2016) - Guo-Liang Wang (2006) - Sophien Kamoun (2003) - Larry Madden (1989)
Excellence in International Service	- Sally A. Miller (2002)
Hewitt and Hewitt Award	- Pierce Paul (2008)
Ruth Allen Award	- Larry Madden (2003) - Harry Hoitink (1998)
APS Volunteer Award	- Thomas K. Mitchell (2016)
APS Press	- Larry Madden, Acquisitions Editor (2008-2013) - Ellie Walsh, Student Member (2013-2016)

APS Office of Education, Director	- Monica Lewandowski (2019-current) - Thomas K. Mitchell (2013-2019)
Office of International Programs	- M. Soledad Benitez Ponce (current member) - Sally A. Miller, Director (2007-2013)
Office of Public Relations and Outreach	- Monica Lewandowski (2014-2019; ex officio 2019-current) - Francesca Hand (2018-current) - Dominique Tate, graduate student member (2016-2017) - Anna Testen, graduate student member (2015-2016)
Public Policy Board	- Coralie Farinas, intern (2019-2021) - Melanie Ivey, intern (2010-2011)
2026 Professional Development Board	- Monica Lewandowski (current member)
External	
Reduced Risks from Invasive Species Coalition, Innovation Award	- Pierluigi Bonello
North American Colleges and Teachers of Agriculture (NACTA) Educator Award	- Thomas K. Mitchell (2015)
NACTA Certificate of Merit	- Monica Lewandowski (2020)
Food Safety Learning Institute Fellow	- Terry Niblack (2019)
Ohio Sports Turf Managers Association Founder's Award	- Joe Rimelspach, Todd Hicks (2019)
Ohio Turfgrass Foundation (OTF) Professionals of the Year	- Joe Rimelspach, Todd Hicks (2013)
Founders Award, Ohio Sports Turf Managers Association	- Joseph Rimelspach (2013)
Multistate Research Award: Response to Emerging Soybean Rust Threat (USDA NIFA and Assoc. of Public and Land-grant Universities)	- Anne Dorrance and Soybean Rust Team (2012)
College of Food, Agricultural, and Environmental Sciences (CFAES)	
Multidisciplinary Team Research Award – Ohio Agricultural Research and Development Center (OARDC) Soybean Research	- Anne Dorrance, Feng Qu, Terry Niblack and Chris Taylor (Plant Pathology); John Finer, Laura Lindsey, Leah McHale, (Horticulture and Crop Science); Andy Michel, (Entomology); Rouf Mian (USDA) (2016)
Multidisciplinary Team Research Award – OARDC Vegetable Safety Research and Extension Program	- Sally Miller, Brian McSpadden Gardener, Feng Qu (Plant Pathology) et al. (2013)
OARDC Distinguished Senior Faculty Research Award	- Guo-Liang Wang (2013) - Larry Madden (1990)
OARDC Distinguished Junior Faculty Award	- Pierce A. Paul (2016)
CFAES Learning Outcomes Award of Distinction	- Plant Pathology Graduate Program, Academic Team (2017)
CFAES Learning Outcomes Award of Distinction	- Master in Plant Health Management, Academic Team (2019)
CFAES Service to Students	- Monica Lewandowski (2017) - Mike Ellis (2014)

Alumni Awards (recent)	
Edison Fowlks	Ohio State Alumni Association, Diversity Champion Award (2019) CFAES Distinguished Alumni Award (2018)
Floyd Poruban	CFAES Distinguished Alumni Award (2010)
Adipala Ekwamu	CFAES International Alumni Award (2010)
Fikrettin Sahin	Turkey's most prestigious science/technology academy award (2019) CFAES International Alumni Award (2007)
Richard Edema	CFAES International Alumni Award (2019)

Appendix 5 - Selected Graduate Student Awards and Recognition (2011-present).

Type of Award	Name (advisor)
Fellowships	
Presidential Fellowships (most prestigious fellowship awarded by the Graduate School)	- Felipe Dalla Lana da Silva (2020) (Paul and Madden) - Cecilia Chagas de Freitas (2019) (Taylor) - Emile Gluck Thaler (2019) (Slot) - Claudio Vrisman (2018) (Miller) - Anna Testen (2017) (Miller) - Horacio Lopez Nicora (2015) (Niblack)
CFAES William E. Krauss Director's Award for Excellence in Research (best Ph.D. publication)	- Emile Gluck Thaler (2019) (Slot) - Alissa Kriss (2011) (Madden and Paul)
University Fellowships	- Melanie Medina (2020) (Benitez) - Naeyeoung Choi (2019) (Wang) - Taylor Klass (2018) (Jacobs and Miller) - Qin Guo (2014) (Qu) - Rachel Capouya (2013) (Mitchell) - Anna Testen (2013) (Miller) - Pengfei Bai (2012) (Wang) - Diane Plewa (2012) (Dorrance)
University Graduate Enrichment Fellowship	- Cristian Olmos (2019) (Jacobs) - Ana Vasquez Catoni(2018) (Benitez) - Dominique Tate (2013) (Mitchell)
Patrick S. Osmer Graduate Fellowship (first year and dissertation year)	- Guillermo Valero David (2019) (Slot) - Edwin Navarro (2019) (Taylor) - Krystel Navarro (2014) (M.S. Taylor; Ph.D. Dorrance)
ENGIE Axium Graduate Scholarship	- Cristian Olmos (2019) (Jacobs)
CFAES (OARDC) Directors Associateships	- Rong Sun (2016) (Qu) - Rachel Capouya (2014) (Mitchell) - Anna Testen (2014) (Miller) - Pengfei Bai (2013) (Wang) - Anna Stasko (2012) (Dorrance)
CFAES Minority/ Diversity Associateship	- Yesenia Velez Negron (2020) (Jacobs) - Marlia Bosques Martinez (2018) (Taylor and Miller) - Rachel Medina Kaufman (2013) (Taylor)
CFAES Environmental Fellowship	- Nathaniel Heiden (2019) (Jacobs) - David Showalter (2011) (Bonello) - Spencer Debenport (2011) (McSpadden Gardener)
Charles E. Thorne Memorial Associateship (one awarded to CFAES Ph.D. student) (no longer offered)	- David Showalter (2015) (Bonello) - Patrick Sherwood (2013) (Bonello)
Excellence in Plant Molecular Biology and Biotechnology Graduate Fellowship (no longer offered)	- David Showalter (2011-2013) (Bonello) - Ellie Walsh (2011-2012) (Taylor)
USAID Innovative Agricultural Research Initiative (iAGRI) Fellowship, Tanzania	Emanuel Mgonga (2012-2015) (Wang and Mitchell)

Poster Awards	
American Phytopathological Society, Plant Health 2019, Cleveland, Ohio	Ana Vasquez Catoni, 1st place, Phytobiomes Award, Poster (Benitez)
American Phytopathological Society, North Central Division, Plant Health 2019, Cleveland, Ohio	Abasola Simon, 1st place, Graduate Student Poster (Paul and Niblack)
2019 Hayes Graduate Research Forum, Columbus, OH	Cecilia Chagas de Freitas, 3rd place, Oral, FAES category (2019) (Taylor)
2018 CFAES Annual Research Conference	Andres Sanabria 2nd place, M.S. category (Miller)
2018 Corn Utilization & Technology Conference, St. Louis	Felipe Dalla Lana da Silva, 2nd place, Student Poster, Mycotoxins (2018) (Paul and Madden)
2017 OSU Hayes Graduate Research Forum. Columbus, OH	Loic Deblais, Finalist, Poster (2017) (Miller)
2016 OSU Extension Annual Conference, Columbus, OH	John Schoenhals (MPHM), 1st place, Student Poster (2016) (Jasinski, project advisor)
2014 OSU Extension Annual Conference, Columbus, OH	Shan Lin, 1st place, Student Poster (2014) (Hand)
2015 Hayes Graduate Research Forum, Columbus OH	Anna Testen, 1st place, Oral, FAES category (2015) (Miller)
American Phytopathological Society, North Central Division, June 13-15, 2012, Wooster, OH	Godwill Chewachong, 2nd place, Grad Student Oral presentation (Qu)
	Andika Gunadi, 2nd place, Grad Student Poster (Dorrance)
	Anna Conrad, 3rd place, Grad Student Poster (Bonello)
OARDC Annual Conference, April 2015, Wooster, OH	Rachel Medina Kaufman, 1st place, M.S. Poster (Taylor)
OARDC Annual Conference, April 2012, Wooster, OH	Jinnan Hu, 2nd place, Ph.D. Poster (Mitchell)
Melhus Graduate Symposium, American Phytopathological Society (selected)	- Anna Conrad (2014) (Bonello) - Jorge David Salgado (2013) (Paul and Madden) - Daniel Anco (2011) (Ellis and Madden) - Alissa Kriss (2011) (Madden and Paul)
Society of Nematology Annual Meeting, Best [student] Paper/Poster	- Horacio Lopez Nicora (2012 and 2013) (Niblack)
External Fellowships	
APS Storkin-Hanes-McCaslin Award for graduate research on soil pathogens (national)	- Ram Khadka (2019) (Miller) - Timothy Frey (2014) (Taylor)
United Soybean Board Fellowship (national competitive fellowship)	Anna Stasko (2014-2018) (Dorrance)
Borlaug Beachell International Scholar (Monsanto) (selected by proposal)	Da-young Lee (2014) (Wang)
Fulbright Scholars	- Fides Zaulda (Qu) – current - Andres Sanabria (graduated 2018) (Miller) - Godwill Mih Chewachong (graduated 2013) (Qu)
U.S. Borlaug Fellow in Global Food Security	- Ram Khadka (Miller) (2018) - Anna Testen (Miller) (2014) - Godwill Chewachong (Qu)
Borlaug Higher Education in Agricultural Research and Development Fellowships	- Mynul Islam (2014) (Miller) - Ferdous-e Elahi (2014) (Miller)

External Scholarships	
Doctoral Research Scholarship, The Nature and Technology Research Fund of Quebec	Emile Gluck-Thaler (Slot)
American HortScholar, 1 of 6 students selected for major international meeting	Coralie Farinas (2018)(Hand)
Mid-Atlantic Nursery Trade Show, Inc. (MANTS) Carville M Amherst Memorial Scholarship	Isabel Emanuel (Hand) (2018)
Ohio Nursery and Landscape Association Phil Kozel Memorial Scholarship	Isabel Emanuel (Hand) (2018)
Ohio Soybean Council Scholarships	- Fides Zaulda (2019) (Qu) - Linda Weber (2018) (Dorrance) - Krystel Navarro (2018) (Dorrance) - Kelsey Scott (2017) (Dorrance) - Ellie Walsh (2015) (Taylor) - Brittany Nauth Tangvald (2012) (Taylor) - Dee Marty (2012) (Taylor)
Kinesis Foundation	- Krystel Navarro (M.S.) (Taylor)
Society of Nematologists	
Society of Nematology John L. Webster Outstanding Student Award	Horacio Lopez Nicora (2016) (Niblack)
Society of Nematology, Graduate Student Association, President	Horacio Lopez Nicora (Niblack)
American Phytopathological Society	
Public Policy Board	- Coralie Farinas, intern (2019-2021) (appointed) - Melanie Ivey, intern (2010-2011) (appointed)
APS Press Publications Board	- Ellie Walsh, student member (2013-2016) (Taylor)
Office of Public Relations and Outreach Board	- Dominque Tate, graduate student member (2016-2017) (appointed) (Mitchell) - Anna Testen, graduate student member (2015-2016) (appointed) (Miller)
Crop Loss Assessment and Risk Evaluation Committee	Felipe Dalla Lana da Silva, Chair (2017) (Paul and Madden)
Forest Pathology Commiutee	Anna Conrad (postdoc), Chair (2017) (Bonello)
Graduate Student Committee	- Anna Testen (2015) - Karasi Mills (2016)
Nematology Committee	- Rachel Medina Kaufman, Chair (2017) (Taylor) - Ellie Walsh, Chair (2015) (Taylor(
Biotechnology Committee	- Dominique Tate, Chair (2016) (Mitchell) - Karasi Mills, Chair (2015) (Paul and Madden)
Other Awards	-
Sigma Xi, The Scientific Research Society	Anna Conrad, OSU chapter (Bonello)
Entomological Society of America, Outreach video award, 1st place	David Showalter and Michael Falk (2014) (Bonello)
Fully-funded crowdfunding project, experiment.com (1 of 2 funded projects)	David Showalter and P. Bonello (2014) Can We Save The Trees from the Emerald Ash Borer? (2014)
Invited speaker, Food Safety Workshop, 2010 American Society for Horticultural Science	Melanie L. Ivey (2010) (Miller)

Appendix 6 - Graduate Student Placement (M.S., MPHM, Ph.D.) (2011-2019).

M.S. Year Graduated	Name	Placement
2011	Oscar Alberto Burbano Figueroa	Agrosavia, Columbia (agricultural research company)
	Kate Marie Gearhart	Pioneer (Ohio)
2012	Matthew W. Wallhead	Ph.D., Univ. of New Hampshire. Current: Extension Ornamental Horticulture Specialist, Asst Professor, Univ. of Maine
	Bridget L. (Francis) Bergey	Sales/Warehouse Management, Advanced Turf Solutions
	Racheal Anne Pack	Non-profit organization
	Jasleen Singh	Ph.D. Indiana Univ
	Chunxue Cao	Last known: BioWorld, Dublin, Ohio
	Maria Veronica Cepeda Miranda	Manager, Bioinnovsa s.a. – Soil Microbiology and Plant Pathology, Ecuador (her own startup)
	Andika Gunadi	Ph.D., Horticulture and Crop Science, Ohio State
2013	Diane E. Plewa	University of Illinois
	Kelsey F. Andersen Onofre	Ph.D., University of Florida. May 2020: Asst. professor, Kansas State
	Ashlina Chin	Marketing Manager, Reading is Fundamental
	Daisy L. D'Angelo	Biology Specialist, Scotts Miracle-Gro Co.
2014	Bhupendra Acharya	Ph.D., Virginia Tech University
	Christine S. Balk	The Davey Tree Co.
	DeeMarie Marty	Technician, USDA ARS, Wooster, OH
	Brittany J. Nauth Tangvald	LifeScience Specialist, Thermo Fisher Scientific, Pittsburgh
2016	Meredith M. Eyre	Adjunct instructor, Castleton Univ., Vermont
	Donald P. Gillis	Ph.D. University of Georgia
2017	Rachel M. (Medina) Kaufman	Staff, Department of Plant Pathology, Ohio State
2018	Kelsey L. Scott	Ph.D., Plant Pathology Ohio State
	Amilcar Jose Vargas Loyo	Staff, Department of Plant Pathology, Ohio State
	Andres Sanabria	Ph.D., North Carolina State University

MPHM Year Graduated	Name	Placement
2014	Mary F. Griffith	OSU Extension, Madison County Co-Director, OH
	Anastasia N. Tonti Kimbler	Account coordinator, CoverMyMeds
	Jason Michael Hartschuh	OSU Extension, Crawford County Director , OH
	Rong Sun	Ph.D., Plant Pathology, Ohio State
2015	Ethan J. Smrtnik	OSU Waterman Farm; currently in industry
	Elizabeth H. Roche	Pharmabees (bee city program), Cardiff Univ., England
	Brian M. Kleinke	Brightview Landscape, Colorado
	Scott C. Erick	USDA APHIS PPQ, Asian Longhorned Beetle Eradication
2016	John M. Schoenhals	MPHM. OSU Extension. Current: Field agronomist, Pioneer

	Nicole V. Wright	Program coordinator, Dept. of Horticulture and Crop Science, Ohio State, Wooster
2017	Zachary S. Foust	Commercial Sales Representative, CROPKING Inc.
	Alice M. Vossbrinck	Center for Life Sciences Education, Ohio State
	Stephen P. Kelleher	USDA Forest Service, intern
	Justin C. Morse	PharmaCannis
	Jiaxuan Tian	Industry job, China
2018	Anna N. DeToro	Davey Tree Expert Co.
	Jack T. Waldock	Crop Services Group
	Helen M. Andrews	Ph.D., Horticulture and Agronomy, Univ of California Davis
	Kodi G. (Stebner) Riedel	Laboratory Coordinator and Diagnostician, Davey Tree Institute
	Jonell G. Winger	Seed Enhancements Lead, Beck's Hybrids
2019	Layne N. Connolly	Research assistant, Dept. of Horticulture and Crop Science, Ohio State
	Sara D. Eff	Research assistant, Scotts Miracle-Gro Co.
	Cali L. Granger	New Mexico, Rio Grande del Norte National Monument
	Jeffrey S. Lutton	Bayer CropScience
	Junaid A. Abdullah	PharmaCannis

Ph.D. Year Graduated	Name	Placement
2011	Daniel J. Anco	Assistant Professor, Clemson University
	Jiye Cheng	Research instructor, St. Louis University, Missouri
	Margaret L. Ellis	Associate Professor, Calif. State University, Fresno
	Melanie L. Lewis Ivey	Assistant Professor, The Ohio State University
	Alyssa B. Kriss	R&D Scientist, Syngenta Crop Protection
	Chan Ho Park	Industry, Rice Tec, Texas
	Hehe Wang	Assistant Professor, Clemson University
	Justin G. A. Whitehill	Univ of British Columbia. Aug 2020: Asst. Professor, Forestry and Envir. Resources, NC State
2013	Chenxi Chen	Bioinformatics scientist, Illumina (Calif)
	Fiorella Cisneros Carter	Research associate, Molecular and Cellular Imaging Center, Ohio State
	Jinnan Hu	Senior Bioinformatics Scientist, Sentieon (Calif)
	Junyan Lin	Senior Scientist, Roche (Calif)
	Godwill Mih Chewachong	Education, Globalization and International Development, Univ. of Cambridge
	Xiaoqing Rong Mullins	Data scientist, Nationwide, Ohio
	Gautam Shaskikant Shirsekar	Postdoctoral Scientist, Max Planck Institute, Germany
	Pattavipha Songkumarn	Faculty, Kasetsart Univ., Thailand
2014	Jorge David Salgado	FMC, Delaware, Ohio
	Patrick W. Sherwood	Chemical Ecologist, James Hutton Institute, Scotland
2015	Anna O. Conrad	Postdoctoral scholar, Ohio State
	Spencer J. Debenport	Scientist, IndigoAg
	Nagendra Subedi	Nepal Polytechnic Institute

2016	Emmanuel Mohamed Mgonja	Agricultural Research Scientist, Tanzania Ministry of Agriculture
	Ellie K. Walsh	General Manager, Otis Gardens, Oregon
	Horacio D. Lopez Nicora	Asst Professor and Director, Plant Clinic, Universidad San Carlos, Paraguay
2017	David N. Showalter	Postdoctoral researcher, University of Minnesota
	Anna L. Testen	Scientist, USDA ARS, Ames, IA
	Jaqueline Huzar Novakowiski	Assistant Professor, University of Passo Fundo, Brazil
2018	Ferdous-e Elahi	Scientific Officer (Plant Pathology) at Bangladesh Agricultural Research Institute (BARI)
	Md. Mynul Islam	Sr. Scientific Officer, Bangladesh Agricultural Research Institute
	Cassidy R. (Gelding) Million	Research Plant Pathologist, USDA ARS, West Lafayette, IN
	Anna Kathryn Stasko	Postdoctoral researcher, North Dakota State
	Pengfei Bai	Postdoctoral researcher, Univ. of Texas
	Pavinee Suttiviriya	Faculty, Burapha University, Chanthaburi campus, Thailand
	Dominique N. Tate	Academic specialist, Plant Pathology, Ohio State
	Rachel D. Capouya	Department of Plant Pathology, C. Wayne Ellett Plant and Pest Diagnostic Clinic, Ohio State
	Loic Deblais	Postdoctoral scholar, Food Animal Health Research Program, Ohio State
	Shan Lin	Applied Research Supervisor, Driscoll's, China
	Claudio M. Vrisman	Biology Characterization Scientist, Corteva Agriscience, Indianapolis
2019	Emile Gluck Thaler	Postdoctoral researcher, University of Pittsburgh
	Dayoung Lee	Postdoctoral researcher, Purdue Univ.
	Timothy Frey	Postdoctoral scholar, Ohio State; Adjunct instructor, College of Wooster
	Qin Guo	Graduated Dec. 2019; in China (quarantine?)
	Krystel Annines Navarro-Acevedo	Research Scientist, Corteva Agriscience, Iowa

Appendix 7 - B.S. Graduates, Placement, Awards and Recognition (2011-2019).

Year Graduated	Name	Last known placement or employer
2011	Amber Hoffstetter	Ph.D., Horticulture and Crop Science, Ohio State. Now: Manager, H&M Produce Farm, Kinsman, Ohio
2011	Alyssa Roberts	Corporate Food Safety and Quality Manager, Great Lakes Cheese, Hiram, Ohio
2011	Timothy Frey	Ph.D., Plant Pathology, Ohio State. Now: Postdoctoral scholar, Ohio State and adjunct instructor, College of Wooster
2013	Shan Lin	Ph.D., Plant Pathology, Ohio State. Now: Applied Research Supervisor, Driscoll's, China
2013	Katherine Gambone	M.S., Plant Pathology, Kansas State
2014	Edward Luersman	M.S. student, OSU, clinical mental health counseling
2014	Elizabeth Roche	MPHM. Pharmabees (bee city), Cardiff Univ., England
2014	John Schoenhals	MPHM. Field agronomist, Pioneer
2014	Christopher Lovekin	Pricing analyst, Whole Foods
2014	Laura Bricker	Compunet Clinical Laboratories, Ohio
2015	Dana Martin	M.S. Plant Pathology, Ohio State
2015	Amanda Ferguson	M.S. Landscape Architecture, Ohio State. Intern, Scott Whitham Landscape Architecture, Ithaca, N.Y.
2015	Zachary Foust	MPHM. Commercial Sales, CROPKING Inc., Ohio
2015	Christina Tomashuk	Foertmeyer & Sons Greenhouse, Ohio
2015	Paige Thrush	Sunny Meadows Farm, Ohio
2015	Charles Kramer	Last known: Ohio State
2016	Alyssa Zearley	M.S. and Research Associate, Environment and Natural Resources (soil quality research), Ohio State
2016	Derrick Freshcorn	Industry consultant
2016	Conner Haney	Agricultural Standards Officer, Ontario CA
2016	Jessica Loucks	Childhood education, central Ohio
2016	Abang Abdul Rahim Ossen	JQ Biotech, Malaysia
2017	Aimmie Altman	Scotts Miracle-Gro Co., Ohio
2017	Christian Young	Ozadia Plant Science, Colorado
2017	Nathan Gifford	Assistant Container Manager/Grower, Studebaker Nurseries, Grove City, Ohio
2017	Bethany Kyre	Ph.D. candidate, Entomology, University of Kentucky
2017	Jenna Moore	M.S. student, Horticulture and Crop Science, OSU
2017	Ambria Small	Laboratory technician, Battelle Memorial Institute, Columbus, Ohio
2017	Stella Beech	Environmental specialist, Ohio EPA
2017	Ashley Rector	Medical school
2018	Caleb Mathias	M.S., Plant Pathology, University of Kentucky
2018	Annie Means	Seasonal education position, Cuyahoga National Forest
2018	Margaret Moodispaw	M.S., Human Nutrition, Ohio State

2018	Nic Petrykowski	Deceased
2018	Katherine Wolfe	Consultant, Carrollton Farmers Exchange Co., Ohio
2018	Monica Pennewitt	Ph.D. student, Plant Pathology Iowa State
2019	Anna Courtney	Unknown
2019	Charis Ramsing	M.S. Sustainable Agriculture student, Erasmus Programme, Europe
2019	Bradley Slyder	Channel Seeds, Ohio

Name	**Awards and Recognition**
Charis Ramsing	- 2019 CFAES Outstanding Senior - American Phytopathological Society (APS), Undergraduate Task Force, student member - Erasmus Programme, master's degree in Sustainable Agriculture, Europe - Karen H. Holbrook Scholarship, OSU Office of Undergraduate Research and Creative Inquiry for internship at IRRI, Philippines - 1st place, CFAES Undergraduate Research Forum
Monica Pennewitt	- 2018 CFAES Outstanding Senior (top 5%) - Agriculture Future of America, Student Advisory Team (national selection) - Ohio Soybean Council Scholarship
Katherine Wolfe	- 2018 CFAES Outstanding Senior
Ashley Rector	- 2017 CFAES Outstanding Senior
Undergraduate Student Organization - PHARM	- 2017 CFAES New Activity Award (for Examine the Famine, a plant pathology outreach speaker panel/dinner targeting OSU student community)
Caleb Mathias	- Wallace-Carver USDA Internship (Peoria IL)
Elizabeth Roche	- Borlaug-Ruan Internship (CYMMIT, Mexico) - Wallace Carver USDA Internship (Fort Detrick, MD)
Katherine Gambone	- CFAES Undergraduate Research Forum, Environmental and Plant Sciences category: 1st place, 2013; 2nd place, 2012. (Bonello, research advisor)
John Schoenhals	- 2016 CFAES Outstanding Senior - L.H. Newcombe Award (highest GPA in CFAES) - Ohio Soybean Council Scholarship (2012)
Edward Luersman	- Presidential Scholar (4-year full scholarship, 2010-2014)
Nicolas Petrykowski	- NSF Graduate Research Fellowship, 2018

Appendix 8 – B.S. Plant Pathology Curriculum Sheet.

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

B.S. in Agriculture
Plant Pathology
Effective Summer 2018

4/11/18

All students must complete two Global Issues courses (▲). All students must take a Social Diversity requirement which in the GE was completing Rural Sociology 1500 or Sociology 1101.

FAES 1100 and PLNTPTH 1100	**.5, .5**	**Social Science 1 (Rural Soc 1500 or Soc 1101)**	**3**
Writing Level 1 (ENG 1110)	**3**	**Social Science 2 (AED Econ 2001 or Econ 2001)**	**3**
Writing Level 2 (2367) see approved CFAES GE List	**3**	**Historical Study** *(see approved CFAES GE List)*	**3**
Agr Comm 3130 or Comm 2110	**3**	**Culture & Ideas or Historical Study** (see approved CFAES GE List)	**3**
Math 1148 or 1150	**4**	**Literature** (see approved CFAES GE List)	**3**
Data Analysis (Comldr 3537, AEDE 2005, AnSci 2260, HCS 2260, ENR 2000, Stat 1450)	**3**	**Art** (see approved CFAES GE List)	**3**
Biology 1101, 1113, ENTMLGY 1101, HCS 2201 or MolGen 1101	**4-5**	**Contemporary Issues** (see approved CFAES GE List)	**3**
Chemistry 1210 or 1910H	**5**	**Minor** (cannot select a minor in Plant Pathology)	**12-15**
Chemistry 1220 or 1920H	**5**	**Major**	**36**
Biology 1114, ENTMLGY 2101, HCS 2202, MolGen 3300	**3-4**	**Internship/Experiential Learning (PLNTPTH 4191)**	**2**
		Electives	**11-16**
		TOTAL CREDIT HOURS	**121**

Major Requirements			**36**
MOLGEN 4500	General Genetics	3	
MICRBIO 4000.01 or 4000.02	Basic and Practical Microbiology	4	
ENR 3000 (lecture) **and** ENR 3001 (lab)	Soil Science	4	
PLNTPTH 5603	Plant Disease Management	3	
PLNTPTH/ENTMLGY 5604	Capstone Course: Problem-Based Studies in Plant Health	2	
MOLGEN 3436	Introductory Plant Physiology	3	
CHEM 2310	Introductory Organic Chemistry	4	

Select one of the following Plant Pathology options (3-5 credit hours)			**3-5**
PLNTPTH 3001 AND PLNTPTH 3002	General Plant Pathology-lecture AND lab	5	
PLNTPTH 6001	Advanced Plant Pathology	3	

Select two of the following (4-8 credit hours)			**4-8**
PLNTPTH 5010	Phytobacteriology	2	
PLNTPTH 5020	Introductory Plant Virology	2	
PLNTPTH 5030	Nematology	2	
PLNTPTH 5040 **and** 5041	Science of Fungi: Mycology Lecture and Lab	4	
PLNTPTH 5110/ENTMLGY 5110	Ecology & Mgmt of Pathogens & Insects Affecting Trees in Forest & Urban Envts	3	
PLNTPTH 5120	Diseases of Ornamentals	2	
PLNTPTH 5130	Turf Diseases and Integrated Turf Health Management	4	
PLNTPTH 5140	Diseases of Field Crops	2	
PLNTPTH 5150	Fruit and Vegetable Diseases	2	
PLNTPTH 5685	Plant Disease Diagnosis	2	

Electives: Select courses to fulfill major (enough to bring total in major to 36 hours)			**0-6**
BIOCHEM 2210	Elements of Biochemistry	4	
CHEM 2510	Organic Chemistry I	4	
CHEM 2520	Organic Chemistry II	4	
ENR 5270	Soil Fertility	3	
ENR 5272	Turfgrass Soils	2	
ENTMLGY 4000	General Entomology	3	
ENTMLGY 4600	Introduction to Insect Science	1	
ENTMLGY 4601	General Insect Pest Management	2	
ENTMLGY 4602	Urban Landscape and Greenhouse Entomology	2	
ENTMLGY 4603	Agricultural Entomology	2	
ENTMLGY 4606	Introduction to Forensic Entomology	2	
ENTMLGY 4607	Veterinary Entomology	2	
HCS 4325	Plant Genetics	3	
HCS 4411	Grain, Oilseed, and Fiber Crops	3	
HCS 5412	Forages, Grasslands, and Prairies	3	
HCS 5422	Principles of Weed Ecology and Management	3	
HCS 5450	Vegetable Crop Production and Physiology	3	
HCS 5460	Fruit Crop Physiology and Production	3	
MICRBIO 4100	General Microbiology	5	
MICRBIO 4130	Microbial Genetics	3	
MOLGEN 5643	Plant Anatomy	3	
PLNTPTH 2000	Molds, Mushrooms, and Mankind	3	
Study Abroad	Study abroad at a foreign institution	varies	
PLNTPTH 5010, 5020, 5030, 5040 and 5041, 5110(ENTMLGY 5110), 5120, 5130, 5140, 5150, and 5685 (if not taken above)		2-4	

Appendix 9 – B.S. Plant Health Management Curriculum Sheet.

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

B.S. in Agriculture
Plant Health Management
Effective Summer 2018

4/10/18

All students must complete two Global Issues courses in the GE (▲). All students must complete a Social Diversity requirement in the GE, which can be done by completing Rural Sociology 1500 or Sociology 1101.

FAES 1100 and PLNTPTH 1100/ENTMLGY 1100	**.5, .5**
Writing Level 1 (ENGLISH 1110)	**3**
Writing Level 2 (See Approved CFAES GE List)	**3**
AGRCOMM 3130 or COMM 2110	**3**
MATH 1148 or 1150	**4**
Data Analysis (Comldr 3537, AEDE 2005, AnSci 2260, HCS 2260, ENR 2000, Stat 1450)	**3**
BIOLOGY 1101, 1113, ENTMLGY 1101, HCS 2201, or MOLGEN 1101	**5**
CHEM 1210 or 1910H	**5**
CHEM 1220 or 1920H	**4**
BIOLOGY 1114, ENTMLGY 2101, HCS 2202, or MOLGEN 3300	**3–5**

Social Science 1 (RURLSOC 1500 or SOCIOL 1101)	**3**
Social Science 2 (AEDECON 2001 or ECON 2001)	**3**
Historical Study (See Approved CFAES GE List)	**3**
Culture & Ideas or Historical Study (See Approved CFAES GE List)	**3**
Literature (See Approved CFAES GE List)	**3**
Art (See Approved CFAES GE List)	**3**
Contemporary Issues (See Approved CFAES GE List)	**3**

Major	**36**
Minor (cannot select a minor in Entomology or Plant Pathology)	**12–15**
Internship/Experiential Learning: PLNTPTH 4191 OR ENTMLGY 4191	**2**
Electives	**10–17**
TOTAL CREDIT HOURS	**121**

Major Requirements (25-29 credit hours) (24-26 credit hours if student has taken ENTMLGY 1101):

ENR	3000 & 3001	Soil Science Lecture & Laboratory	4
*HCS 2201; Ecology of Managed Plant Systems OR HCS 2202: Form and Functions of Cultivated Plants			4
HCS	5422	Principles of Weed Ecology and Management	3
MOLGEN	3436	Introductory Plant Physiology	3
PLNTPTH	5603	Plant Disease Management	3
PLNTPTH/ENTMLGY	5604	Capstone Course: Problem-Based Studies in Plant Health	2

Select one of the following core plant pathology courses (required):

PLNTPTH	3001 & 3002	General Plant Pathology Lecture & Laboratory	5
PLNTPTH	6001	Advanced Plant Pathology	3

Select one of the following core entomology course:
(Required only if student did not take ENTMLGY 1101 as BIO SCI requirement)

ENTMLGY	3000	General Entomology	3
ENTMLGY	4600	Introduction to Insect Science	1

Select one of the following entomology support courses (required):

ENTMLGY	4601	General Insect Pest Management	2
ENTMLGY	4602	Urban Landscape and Greenhouse Entomology	2
ENTMLGY	4603	Agricultural Entomology	2

*If student took one of these classes as a GE course, these 3 credit hours must be made up in the major electives.

Electives (enough to bring total in major to 36 hours realizing if student took HCS 2201 or ENTMLGY 1101 as GE, these hours will not count in the major)

BIOCHEM 2210	Elements of Biochemistry	4	HCS 4411	Grain, Oilseed, and Fiber Crops	3
BIOCHEM 4511	Introduction to Biological Chemistry	4	HCS 5412	Forages, Grasslands, and Prairies	3
CHEM 2310	Introductory Organic Chemistry	4	HCS 5450	Vegetable Crop Production and Physiology	3
CHEM 2510	Organic Chemistry I	4	HCS 5460	Fruit Crop Physiology and Production	3
CHEM 2520	Organic Chemistry II	4	MICRBIO 4000.01 or .02	Basic and Practical Microbiology	4
EEOB 3310.01 or .02	Evolution	4	MICRBIO 4100	General Microbiology	5
EEOB 3410	Ecology	4	MICRBIO 4130	Microbial Genetics	3
ENR 5270	Soil Fertility	3	MOLGEN 4500	General Genetics	3
ENR 5272	Turfgrass Soils	2	PLNTPTH 2000	Molds, Mushrooms, and Mankind	3
ENTMLGY 3330/4440H	Social Insects	3	PLNTPTH 5010	Phytobacteriology	2
ENTMLGY 4606	Introduction to Forensic Entomology	2	PLNTPTH 5020	Introductory Plant Virology	2
ENTMLGY 4607	Veterinary Entomology	2	PLNTPTH 5030	Nematology	2
ENTMLGY 5130	Field Insect Taxonomy	3	PLNTPTH 5040/5041	Science of Fungi: Mycology Lecture and Lab	4
ENTMLGY 5420	Insect Behavior Mechanisms and Function	3	PLNTPTH 5110/ENTMLGY 5110	Ecology and Mgmt of Pathogens and Insects Affecting Trees in Forest and Urban Envts.	3
ENTMLGY 5500	Biological Control of Arthropod Pests	3			
ENTMLGY 5600	Principles and Applications of IPM	3	PLNTPTH 5120	Diseases of Ornamentals	2
ENTMLGY 5800	Pesticide Science	3	PLNTPTH 5130	Turf Diseases & Integrated Turf Health Mgmt	4
ENTMLGY 6310	Insect Physiology and Molecular Biology	3	PLNTPTH 5140	Diseases of Field Crops	2
ENTMLGY 6410	Insect Ecology and Evolutionary Processes	3	PLNTPTH 5150	Fruit and Vegetable Diseases	2
HCS 4325	Plant Genetics	3	PLNTPTH 5685	Plant Disease Diagnosis	2
			Study Abroad	Study abroad at a foreign institution	varies
			Total		**36**

Appendix 10 – Plant Pathology Minor Curriculum Sheet.

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Plant Pathology Minor
Food, Agricultural, and Environmental Sciences
3/26/18

Dr. Thomas Mitchell, Associate Professor
201 Kottman Hall
2021 Coffey Rd.
614-292-1375
mitchell.815@osu.edu

The Minor in Plant Pathology is designed to provide essential knowledge and training for careers that involve plant health management of agronomic crops, landscape/nursery plants, turfgrass, and forest plants. The minor is specifically targeted to Turfgrass Science, Crop Science, Landscape Horticulture, Forestry, and Urban Forestry majors, although it is open to all students interested in plants, mycology, biology, microbiology, and microbiology. The Minor in Plant Pathology is also valuable for students interested in the biology of plant disease and plant-microbe interactions, such as majors in Biology, Plant Biology and Microbiology.

Students pursuing the Minor in Plant Pathology are required to take Plant Pathology 3001, 3002 – General Plant Pathology – to develop a foundational understanding of plant pathology. This class has a prerequisite of a general biology class or natural science GE course. In addition to Plant Path 3001, 3002 and Plant Path 5603 Plant Disease Management course, students must take one course that deals with diseases of a particular cropping system, such as ornamental plants and flowers (Plant Path 5120), forest and shade trees (Plant Path 5110), turfgrass (Plant Path 5130), field crops (Plant Path 5140) and fruits and vegetables (Plant Path 5150). Additional courses in plant pathology, microbiology, soil science and plant biology are available as elective coursework.

The Minor in Plant Pathology consists of 12 credit hours selected as follows.

Required:			**Credit Hours**
PLNTPTH	3001	General Plant Pathology Lecture	3
PLNTPTH	3002	General Plant Pathology Lab	2
PLNTPTH	5603	Plant Disease Management	3
Select one of the following courses (2-4 credit hours):			
PLNTPTH	5110	Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments	3
PLNTPTH	5120	Diseases of Ornamental Plants	2
PLNTPTH	5130	Turfgrass Diseases and Integrated Turf Health Management	4
PLNTPTH	5140	Diseases of Field Crops	2
PLNTPTH	5150	Fruit and Vegetable Diseases	2
Electives (Select enough hours to bring total in minor to 12 credit hours):			
ENR	5270	Soil Fertility	3
ENTMLGY	4000	General Entomology	3
MICROBIO	4000.01	Basic and Practical Microbiology	4
MICROBIO	4100	General Microbiology	5
MOLGEN	3436	Introductory Plant Physiology	3
PLNTPTH	2001	Sick Plants in a Hungry World	2
PLNTPTH	4550	Bioterrorism: An Overview	3
PLNTPTH	5010	Phytobacteriology	2
PLNTPTH	5020	Virology	2
PLNTPTH	5030	Nematology	2
PLNTPTH	5040 and 5041	Science of Fungi: Mycology Lecture and Lab	4
PLNTPTH	5110	Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments (If not taken above)	3
PLNTPTH	5120	Diseases of Ornamental Plants *(If not taken above)*	3
PLNTPTH	5130	Turfgrass Diseases and Integrated Turf Health Management *(If not taken above)*	4
PLNTPTH	5140	Diseases of Field Crop *(If not taken above)*	2
PLNTPTH	5150	Fruit and Vegetable Diseases *(If not taken above)*	2
PLNTPTH	5685	Plant Disease Diagnosis	2
Study Abroad		Study at a Foreign Institution	varies

A minimum of 12 credit hours are required for the Minor in Plant Pathology. Plant Pathology classes taken to fulfill major requirements cannot be used towards a minor. In the case that 3001 and/or 3002 are taken in a major, a student should select at least 12 credit hours from the list above, excluding 3001 and 3002.

TOTAL credit hours for minor in plant pathology **12**

Restrictions and General Information

1. This minor is not available to students majoring in Plant Pathology or Plant Health Management.
2. A minor should be declared by the time a student accumulates 60 hours.
3. A minimum 2.00 cumulative point-hour ratio is required in the minor course work; and a minimum grade of a C- is required for each course used to complete the minor.
4. A student is permitted to overlap up to 6 credit hours between the GE and the minor.
5. The minor must contain a minimum of 12 credit hours distinct from the major and/or additional minors (i.e. if a minor requires more than 12 credit hours, a student is permitted to overlap those hours beyond 12 with the major or with another minor.
6. The minor must include at least 6 hours of upper-level or upper-division course work (3000 or above).
7. Course work graded Pass/Non-Pass cannot count in the minor, and no more than 3 credit hours of course work graded Satisfactory/Unsatisfactory may count toward the minor.
8. No more than 3 credit hours of xx93 may count toward the minor.
9. A student is permitted to count up to 6 total hours of transfer credit and/or credit by examination.

Appendix 11A - M.S. Advising Sheet.

M.S. in Plant Pathology - Advising Sheet

New graduate students with no previous plant pathology experience will be asked to take/review an online version of General Plant Pathology prior to their first semester.

Course number	Course Title	Credits	Term
CORE			
PLNTPTH 5010	Phytobacteriology	2	AU Year 1
PLNTPTH 5020	Introductory Plant Virology	2	AU Year 1
PLNTPTH 6002.01	Advanced Plant Pathology Laboratory - Viruses and Bacteria	1	AU Year 1
PLNTPTH 5040 & PLNTPTH 5041	Science of Fungi: Mycology Lecture (3 cr) & Science of Fungi: Mycology Lab (1 cr)	4	AU Year 1
OR			
PLNTPTH 5050	Plant Pathogenic Fungi	3	SP Year 1
PLNTPTH 5030	Plant Nematology	2	SP Year 1
PLNTPTH 6002.02	Advanced Plant Pathology - Plant Pathogenic Fungi and Nematodes	1	SP Year 1
PLNTPTH 5685	Plant Disease Diagnosis	2	SU Year 1 or 2
PLNTPTH 5603	Plant Disease Management	3	AU Year 2
Variable	Statistics class, as determined in consultation with *SAC	3	AU or SP Year 2
ELECTIVES	Determined in consultation with SAC	Varies	
ENGLISH courses (may be required for international students depending on ESL composition placement)			
EDUTL 5901	Advanced English as a Second Language (if required)	3	Year 1
EDUTL 5902	Advanced Writing in English as a Second Language (if required)	3	Year 1
SEMINAR			
Students will enroll in PLNTPTH 8899 Seminar (1 credit) each Autumn & Spring semester		Varies	AU, SP
RESEARCH CREDITS			
Students will enroll in PLNTPTH 8999 Research each term (variable credits), including Summer, to fulfill full-time enrollment requirements for associateships/fellowships		Varies	AU, SU, SP
	****TOTAL CREDITS**		

* **Student Advisory Committee (SAC)**. The SAC consists of the major advisor and at least two graduate faculty, including the major advisor. At least two of the SAC members must be regular faculty in the Department of Plant Pathology. The SAC can approve electives, schedule changes or course substitutions. Course substitutions should be clearly documented, with a brief justification, on Form I and submitted to the Graduate Studies Committee chair.

****TOTAL CREDITS:** The M. S. credit requirement is 30 graduate credit hours (semester), including research (8999) and seminar (8899) credits, with a minimum cumulative GPA of 3.0. Eighty (80) percent of those required credit hours must be completed at this University over a period of at least two semesters (Graduate School Handbook). Full-time students on graduate appointments typically exceed 30 total credits.

Appendix 11B - Ph.D. Advising Sheet.

Ph.D. in Plant Pathology - Advising Sheet

New graduate students with no previous plant pathology experience will be asked to take/review an online version of General Plant Pathology prior to their first semester.

Course number	Course Title	Credits	Term
CORE			
PLNTPTH 5010	Phytobacteriology	2	AU Year 1
PLNTPTH 5020	Introductory Plant Virology	2	AU Year 1
PLNTPTH 6002.01	Advanced Plant Pathology Laboratory - Viruses and Bacteria	1	AU Year 1
PLNTPTH 5040 & PLNTPTH 5041	Science of Fungi: Mycology Lecture (3 cr) & Science of Fungi: Mycology Lab (1 cr)	4	AU Year 1
OR			
PLNTPTH 5050	Plant Pathogenic Fungi	3	SP Year 1
PLNTPTH 5030	Plant Nematology	2	SP Year 1
PLNTPTH 6002.02	Advanced Plant Pathology - Plant Pathogenic Fungi and Nematodes	1	SP Year 1
PLNTPTH 5685	Plant Disease Diagnosis	2	SU Year 1 or 2
PLNTPTH 5603	Plant Disease Management	3	AU Year 2
Variable	Statistics class, as determined in consultation with *SAC	3	AU or SP Year 2
PLNTPTH 8400	Molecular Bases of Plant Host-Microbe Interactions	3	SP Year 2
ELECTIVES	Determined in consultation with SAC	Varies	
ENGLISH courses (may be required for international students depending on ESL composition placement)			
EDUTL 5901	Advanced English as a Second Language (if required)	3	Year 1
EDUTL 5902	Advanced Writing in English as a Second Language (if required)	3	Year 1
SEMINAR			
Students will enroll in PLNTPTH 8899 Seminar (1 credit) each Autumn & Spring semester		Varies	AU, SP
RESEARCH CREDITS			
Students will enroll in PLNTPTH 8999 Research each term (variable credits), including Summer, to fulfill full-time enrollment requirements for associateships/fellowships		Varies	AU, SU, SP
	****TOTAL CREDITS**		

* **Student Advisory Committee (SAC)**. The SAC consists of the major advisor and at least two graduate faculty. Including the major advisor. At least two of the SAC members must be regular faculty in the Department of Plant Pathology. The SAC can approve electives, schedule changes or course substitutions. Course substitutions should be clearly documented, with a brief justification, on Form I and submitted to the GSC chair.

****TOTAL CREDITS:** The Ph.D. credit requirement is 90 graduate credit hours (semester), including research (8999) and seminar (8899) credits, with a minimum cumulative GPA of 3.0. At least 50 of those graduate credits must be completed beyond the master's degree (Graduate School Handbook). Full-time students on graduate appointments typically exceed 90 total credits.

Appendix 12 - List of Plant Pathology Courses.

PLNTPTH COURSES (not including internship, individual studies and research credits)
AU = Autumn Semester, SP = Spring Semester, SU = Summer Term.

2000-2999 = UG - Intermediate Level Undergraduate Courses

PLNTPTH 1100 – Exploring Plant Pathology (0.5 credits)
Survey course (7 wk) for new undergraduates. Co-taught with Entomology and Horticulture and Crop Science. AU. (M Lewandowski)

PLNTPTH 2000 - Molds, Mushrooms, and Mankind (3 credits)
General Educ. Natural Science: Biological Science. SP. (TK Mitchell)

PLNTPTH 2001 - Sick Plants and a Hungry World (2 credits)
Review of the interactions of plants with plant pathogens and the social, economic, and historic consequences for civilization. Online. AU, SP, SU. (S Williams)

3000-3999 = UG - Upper Level Undergraduate Courses

PLNTPTH 3001 - General Plant Pathology Lecture (3 credits)
Introduction to plant diseases caused by fungi, bacteria, viruses, nematodes and parasitic higher plants. Enrollment 50-75. AU. Videolink to Wooster. (F Hand)

PLNTPTH 3002 - General Plant Pathology Lab (2 credits)
The lab portion of general plant pathology. Typically 2-3 lab sections, including Wooster. AU. (F Hand, coordinator)

4000-4999 = Advanced Level Undergraduate Courses

PLNTPTH 4597 - Contemporary Issues: Pesticides, Genetic Engineering, and the Environment (3 credits)
Contemporary, cultural, and social issues related to pesticide use, genetic engineering and sustainable plant management. General Educ course. Online AU, SP and SU. (M Lewandowski)

5000-5999 - UG and G (Graduate) - Dual Career Level Courses

PLNTPTH 5010 - Phytobacteriology (2 credits)
Taxonomy, molecular biology, physiology, and ecology of plant-associated bacteria that interact with plants, especially those that cause disease and affect plant health. AU. (M.S. Benitez Ponce)

PLNTPTH 5020 - Introductory Plant Virology (2 credits)
Plant virus structures, genome organizations and replication strategies. Symptoms and diagnosis of virus diseases of plants. AU. (F Qu)

PLNTPTH 5030 - Plant Nematology (2 credits)
Introduction to plant-parasitic nematodes, with emphasis on identification, epidemiology and host interactions. SP. (C Taylor)

PLNTPTH 5040 - Science of Fungi: Mycology Lecture (3 credits)
Diversity, biology, and genetics of fungi. AU. (J Slot)

PLNTPTH 5041 - Science of Fungi: Mycology Lab (1 credit)
Lab course for PLNTPTH 5040. AU. (J Slot)

PLNTPTH 5050 – Plant Pathogenic Fungi (3 credits)
Biology of plant pathogenic fungi. SP. (J Slot, T Mitchell)

PLNTPTH 5060 – Practical Experiences in Plant Health: Insects and Diseases of Plants
Newly approved as an online course. Recognize plant health problems in the field. Online with incorporation of field days, workshops and site visits in each students locale. Summer offering in conjunction with Entomology. Provides hands-on experience for MPHM and other students.

PLNTPTH 5110 - Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments (3 credits)
Overview of major pathogens and insects affecting health of forest and shade trees with emphasis on diagnosis, ecology, and management. Co-taught with Entomology. Every other SP. (P Bonello)

PLNTPTH 5120 - Diseases of Ornamental Plants (2 credits)
Biology and integrated control of important diseases of ornamental plants. In person and online. AU. (F Hand)

PLNTPTH 5130 - Turf Diseases and Integrated Turf Health Management (4 credits)
Diseases of turfgrass; management. Required of turfgrass science majors. Incorporates projects/hands-on experiences. AU. (J Rimelspach, T Hicks)

PLNTPTH 5140 - Diseases of Field Crops (2 credits)
Key diseases that impact crop plants, emphasis on identification, management strategies and field evaluations of management strategy. AU. (P Paul, A Dorrance previously taught)

PLNTPTH 5150 - Fruit and Vegetable Diseases (2 credits)
Study the major diseases of fruit and vegetable crops with emphasis on disease diagnosis and management. In person and online. SP. (S Miller, M L Ivey)

PLNTPTH 5603 - Plant Disease Management (3 credits)
Theory and practice of plant disease management; emphasis on integration of cultural, biological, chemical methods and plant disease resistance. In person and online. SP. (L Madden, D Tate)

PLNTPTH 5604 - Capstone Course: Problem-Based Studies in Plant Health (2 credits)
Preparation for the workforce; addressing actual plant health situations. Cross-listed and offered with Entomology. SP. (M Lewandowski, E Klinger from Entomology)

PLNTPTH 5685 - Plant Disease Diagnosis (2 credits)
Study of field and laboratory procedures for diagnosis of plant diseases. Summer 2-week intensive course. (S Miller odd-numbered yrs in Wooster; F Hand even-numbered yrs in Columbus)

6000-6999 = G - Foundational Level Graduate and Professional Courses

PLNTPTH 6001 - Advanced Plant Pathology (3 credits)
An advanced level of study in plant pathology covering fungi, bacteria, viruses, nematodes and parasitic higher plants. Online version in development. (D Tate)

PLNTPTH 6002.01 - Advanced Plant Pathology Lab - Viruses and Bacteria (1 credit)
Lab course for Phytobacteriology and Plant Virology (PLNTPTH 5010 and 5020). Lab and field techniques in virology and bacteriology. AU. (M.S. Benitez Ponce, F Qu)

PLNTPTH 6002.01 - Advanced Plant Pathology Lab - Plant Pathogenic Fungi and Nematodes (1 credit)
Lab course for Nematology and Plant Pathogenic Fungi (PLNTPTH 5030 and 5050). Lab and field techniques in mycology and nematology. SP. (R Capouya)

7000-7999 = G - Intermediate Level Graduate and Professional Courses

PLNTPTH 7002 - Plant Disease Epidemiology (3 credits)
Study of the dynamics of plant diseases; statistical modeling of plant disease epidemics. In person and online. Even numbered yrs, SP. (L Madden)

PLNTPTH 7003.01 - Agricultural Genomics: Principles and Applications (2 credits)
Principles of genetic technologies, new developments, applications in agriculture. This is a 7 wk course and is followed by Horticulture and Crop Science (HCS) 7003.02 Agricultural Genomics: Principles and Applications (2 credits). Even numbered yrs, SP (G-L Wang and E Stockinger)

PLNTPTH 7004 – Functional Biochemistry of Plant Defense (3 cr)
Signaling pathways and networks involved in plant defense against microbial pathogens. AU. (Y Xia)

8000-8999 = G - Advanced Level Graduate and Professional Courses

PLNTPTH 8300 - Current Topics in Plant Pathology (1-2 credits)
Various topics.

PLNTPTH 8400 - Molecular Bases of Plant Host-Microbe Interactions (3 credits)
Introduction to plant host-pathogen interactions, with emphasis on molecular bases of pathogen virulence and host resistance. Team taught; currently under revision to offer the topic as 2 courses.

PLNTPTH 8899 - Plant Pathology Seminar (1 credit

PLNTPTH 8901 - Mentored Teaching in Plant Pathology (1-3 credits)
Hands-on and mentored experiences focused on direct interaction with students and scholarly aspects of teaching. (Coordinator, F Qu)

PLNTPTH 8902 - Mentored Extension/Outreach Teaching in Plant Pathology (1 credit)
Hands-on experience in developing and delivering Extension educational programs and materials. (Coordinator, P Paul)

Under development – courses are often initially offered as Current Topics (PLNTPTH 8300) before going through the more extensive course submission process. List subject to change.

PLNTPTH 3333 – Field and Woodland Fungi (2 cr)
To be developed in conjunction with the Mycology minor (J Slot)

PLNTPTH 5003.01 - Molecular Plant-Microbe Interactions (2 cr)
Currently being taught as a Current Topics course. Session 1, 7 wks (G-L Wang, Y Xia)

PLNTPTH 5003.02 – Molecular Plant-Microbe Interactions (2 cr)
Currently being taught as a Current Topics course. (J Jacobs)

PLNTPTH 5XXX – [Bacterial Mutants!]
Molecular lab techniques; students develop and test a novel research hypothesis in a group project; design experiments, analyze results and prepare publication. The course will also involve assessment of student learning in a hypothesis-driven research project, and how other courses could be developed around different topics. (J Jacobs and M Lewandowski)

PLNTPTH XXXX – Plant-associated microbiomes and their applications
Currently being taught as a Current Topics course (Y Xia and M.S. Benitez)

Appendix 13 - MPHM Advising Sheet.

THE OHIO STATE UNIVERSITY

College of Food, Agricultural, and Environmental Sciences
Ohio Agricultural Research and Development Center

Department of Plant Pathology
Department of Entomology
mphm.osu.edu

Master's in Plant Health Management Curriculum Advising Sheet	PSM PROFESSIONAL SCIENCE MASTER'S
MPHM Graduate Chairs	
Dr. Thomas K Mitchell (mitchell.815@osu.edu) Dr. Celeste Welty (welty.1@osu.edu)	

Requirements and Curriculum
Master in Plant Health Management students are required to complete a minimum of 35 credit hours of graduate work with a minimum cumulative GPA of 3.0. At least 25 credit hours must be earned at OSU.

	Semester Credit Hrs
Core Courses	24-25
Targeted course in Plant Pathology or Entomology	2-3
Special Study or Internship	4-5
Directed Electives	2-5
Total credits	35

Course and Credit Hour Requirements
All students seeking a Master in Plant Health Management will take the following courses. Note this is an interdisciplinary program, so some core requirements are in the School of Environment and Natural Resources and Dept. of Horticulture and Crop Science.

Required Core Courses (24 to 25 credits):		Credits	Semester
PLNTPTH 5603	Plant Disease Management	3	Fall
PLNTPTH 5685	Plant Disease Diagnosis	2	Summer
ENTMLGY 5600	Principles and Applications of Integrated Pest Management	3	Spring
ENTMLGY 5800	Pesticide Science	3	Fall
ENR 5270	Soil Fertility	3	Fall
H&CS 5422	Biology and Management of Weeds and Invasive Plants	3	Fall
H&CS 5621	Physiology of Cultivated Plants	3	Fall
H&CS 8887	Experimental Design	4	Fall
OR H&CS 5887	Introduction to Experimental Design	3	Spring
PLNTPTH 7300	SPECIAL TOPICS-Seminar Course	1	Spring
ENTMLGY 7300	*this is open to all enrolled students each semester*	1	Fall
Choose one of the following from Plant Pathology/Entomology (2-3 credits):			
PLNT PTH 5110/ENTMLGY5110	Ecology and Management of Pathogens and Insects Affecting trees in Forest and Urban Environments	3	Spring
PLNTPTH 5120	Diseases of Ornamental Plants	2	Fall
PLNTPTH 5130	Turfgrass Diseases and Integrated Turf Health Management	3	Fall
PLNTPTH 5140	Diseases of Field Crops	2	Fall
PLNTPTH 5150	Diseases of Fruit and Vegetables	2	Spring
ENTMLGY 5608	Turfgrass Insect and Mite Pests - Identification, Biology, and Management	2	Spring
ENTMLGY 5130	Field Insect Taxonomy	3	
ENTMLGY 5500	Biological Control of Arthropod Pests	3	Spring

THE OHIO STATE UNIVERSITY

Select one of the following field of study/special internship classes (4-5 credits):

ENTMLGY 6193	Individual Study	4-5
PLNTPTH 6193	Individual Study	4-5
ENTMLGY 6502	Mentored Extension Experience in Entomology	1-3
PLNTPTH 8902	Mentored Extension/Outreach in Plant Pathology	4-5

Electives

Through careful consultation with their advisors, students must take elective courses that best reflect their personal interest. The following are courses supporting different "fields of interest". Other classes may also be considered to meet individual needs of student. These courses should be approved by the student's advisor.

AEDECON 4330	The Sustainable Economy: Concepts and Methods	3
AEDECON 4597.01	Problems and Policies in World Population, Food, and Environment	3
AEDECON 4310	Environmental and Resources Economics	3
AEDECON 5250	Commodity Futures and Options Markets	2
AEDECON 5330	Benefit Cost Analysis	3
AEDECON 6010	Applied Microeconomics I	4
AEDECON 6020	Applied Microeconomics II	4
AEE 7300	Advanced Teaching Methods	3
AEE 7320	Adult Learning and Professional Development	
AEE 7700	Documenting Change through Evaluation and Accountability	3
AEE 7230	Strategic and Program Planning for Visionary Change	3
AEE 8420	Leadership and Administration in Agriculture and Extension Education	3
AEE 8835	Methods in Teaching Agriculture	2
EEOB 5460	Physiological Ecology	3
ENR 5265	Characterization of Soil in Field and Laboratory Sampling	2
H&CS 5602	Ecology of Agriculture	3
H&CS 7625	Plant Breeding and Biotechnology	3
H&CS 7821	Advanced Crop Physiology	3
Advanced Statistics Course (agreed upon by SAC)		3

In addition to the courses listed above, the following courses may also be taken as electives:

ENTMLGY 5420	Insect Behavior Mechanisms and Function	3
ENTMLGY 6410	Insect Ecology and Evolutionary Processes	3
ENTMLGY 6704	Systems Analysis from Molecules to Ecosystems	2
ENTMLGY 7910	The Nature and Practice of Science	2
PLNTPTH 5040	Science of Fungi: Mycology Lecture	3
PLNTPTH 5041	Science of Fungi: Mycology Lab	1
PLNTPTH 6001	Advanced Plant Pathology	3

Final Exam

As per the requirement of the graduate school, each student will complete a Final Master's Examination which will include **both** a written and oral examination. The examination will evaluate the student's proficiency and understanding of his/her field of study, with emphasis on the topic selected from students special projects/internships.

Appendix 14. Revenue generated from MPHM student credit hours (2013-2017).

Class	FY13	FY14	FY15	FY16	FY17	Grand Total
D1130-Entomology	**$7,968**	**$20,440**	**$81,383**	**$32,073**	**$109,581**	**$251,445**
4600 Intro Insect Sci	$1,007	$1,007	$2,990	$0	$982	$5,987
5110 Tree Health	$0	$0	$0	$3,293	$6,804	$10,097
5500 Biol Control	$0	$0	$6,672	$3,293	$13,609	$23,574
5600 IPM	$3,655	$7,310	$29,466	$10,120	$47,358	$97,908
5608 Turfgrass Pests	$0	$0	$0	$0	$2,268	$2,268
5800 Pesticide Sci	$3,306	$6,613	$26,687	$9,879	$23,816	$70,301
6193 Indiv Studies	$0	$5,511	$2,224	$4,391	$9,073	$21,198
6501 Teaching	$0	$0	$0	$0	$2,268	$2,268
7300 Seminar	$0	$0	$2,224	$0	$1,134	$3,358
7890 Special Topics	$0	$0	$4,448	$1,098	$0	$5,546
7910 Nature of Sci	$0	$0	$2,224	$0	$2,268	$4,492
8999 Research	$0	$0	$4,448	$0	$0	$4,448
D1178-Plant Pathology	**$24,247**	**$30,859**	**$115,645**	**$25,246**	**$66,910**	**$262,908**
5020 Plant Virology	$0	$0	$0	$0	$2,268	$2,268
5040 Mycology	$3,306	$0	$0	$0	$0	$3,306
5041 Mycol Lab	$1,102	$0	$0	$0	$0	$1,102
5110 Tree Health	$0	$3,306	$10,008	$0	$3,402	$16,716
5120 Dis Ornamental	$0	$2,204	$0	$0	$4,536	$6,741
5130 Turf Dis	$0	$0	$4,448	$0	$0	$4,448
5140 Dis Field Crops	$2,204	$0	$6,672	$5,488	$6,804	$21,169
5150 Fruit Veg Dis	$0	$2,204	$6,672	$0	$6,804	$15,681
5550 Quant Methods	$3,306	$0	$3,336	$0	$0	$6,642
5603 Plant Dis Mgt	$3,306	$6,613	$13,344	$6,586	$23,816	$53,664
5685 Plnt Diagn	$2,204	$4,408	$15,568	$4,391	$4,536	$31,107
6001 Adv Plnt Path	$0	$3,306	$0	$0	$3,402	$6,709
6193 Indiv Studies	$3,306	$2,204	$10,008	$5,488	$5,670	$26,677
7300 Seminar	$0	$0	$0	$2,195	$2,268	$4,463
8300 Current Topics	$2,204	$3,306	$6,672	$0	$3,402	$15,585
8901 Teaching	$3,306	$3,306	$3,336	$1,098	$0	$11,046
8999 Research	$0	$0	$35,583	$0	$0	$35,583
Grand Total	**$32,215**	**$51,299**	**$197,028**	**$57,319**	**$176,491**	**$514,352**

Appendix 15 - Plant Pathology Faculty – International Projects.

Plant Pathology faculty (bold) + collaborators	Project
MS Benitez and Groundworks BioA, Israel. OSU SEEDS Partnership Grant	Arbuscular mycorrhizal inoculation effects on soybean cyst nematode infestation: Modes of action
P Bonello, G-L Wang, L Stewart and Tanzanian collaborators. Bill & Melinda Gates Foundation Grand Challenges Explorations project	Aerial plant disease surveillance by spectral signatures; early detection of rice blast and maize lethal necrosis virus with stratified satellite/drone-mounted remote sensing technology in Tanzania
P Bonello, F Hand and collaborators at International Programs of the USDA Forest Service, China, Italy, Sweden	Global, reciprocal sentinel gardens approach to assess risk of invasion by alien pathogens and insect pests of important woody plant species
P Bonello and John Innes Center, Kew Botanical Gardens, Department for Environment, Food & Rural Affairs, United Kingdom	Screening British accessions of European ash (*Fraxinus excelsior*) for resistance to emerald ash borer (EAB)
P Bonello and Luis 'Aranha' Camargo, University of Sao Paulo, Brazil; Escola Superior de Agricultura Luiz de Queiroz (ESALQ)	Non-destructive resistance phenotyping of sugarcane to ratoon stunting disease with Fourier-transform infrared analysis
P Bonello, Grupo de Xenética e Ecoloxía Forestal, Misión Biolóxica de Galicia, Pontevedra, Galicia, Spain	Genetic variation in the constitutive defensive metabolome and its inducibility in maritime pine
J Jacobs and French Xanthomonas Network, L. Noel, CNRS, LIPM, Toulouse, FR and B. Szurek, IPME, IRD, Montpellier, FR. USDA NIFA grant	Defining the basis of vascular and non-vascular pathogenesis in plant pathogenic *Xanthomonas* species
J Jacobs, F Hand and M. Agnes-Jacques, INRA—Angers, France; G. Marchi, Univ. of Florence, Italy	Sequenced based diagnostics to characterize the *Xylella* olive quick decline epidemic
J Jacobs and K Garett, Univ. of Florida; J Leach, Colorado State, B. Szurek, IRD, France; R Oliva, IRRI, Philippines	Modeling pathogen emergence to determine durability of disease resistance
J Jacobs, C. Allen, UW-Madison' A. Sanchez, U. de San Carlos, Guatemala	Tropical agriculture and ecology course, Univ. of Wisconsin, U. de San Carlos, Guatemala, Ohio State
M Lewis Ivey, S Miller and Rwandan collaborators	Tufts University of Global One Health Equity (UGHE) One-Health Fellowship Program – mentoring a fellow to develop fresh produce safety programs for women in agriculture in Rwanda
L Madden and H Piepho, University of Hohenhein, Stuttgart, Germany	Improved methods for network meta-analysis in agriculture and other fields
L Madden and Xiangming Xu, Horticulture Research Institute (HRI) England; Gareth Hughes, Rural College (SRUC), Edinburgh, Scotland, United Kingdom	Characterization of small-scale spatial patterns of plant disease incidence
L Madden and M Jeger, Imperial College, London, United Kingdom; F van den Bosch, Rothamsted Research, Harpenden, United Kingdom	Modeling of plant virus disease epidemics
S Miller and Virginia Tech, UC-Davis, Sokoine University of Agriculture and Mikocheni Agricultural Research Institute (Tanzania), Kenya Agriculture and Livestock Research Organization (KALRO), Hawassa University (Ethiopia),	USAID Feed the Future IPM Innovation Laboratory in East Africa- vegetable crops, research and outreach in Kenya, Tanzania and Ethiopia

S Miller, J Jacobs and Virginia Tech, Penn State , Washington State, Bangladesh Agricultural Research Institute, Bangabandhu Sheikh Mujibur Rahman Agricultural University, iDE-Nepal, Natl Agricultural Research Council-Nepal, Center for Environmental and Agricultural Policy Research, Extension, and Development, iDE, General Directorate of Agriculture of the Ministry of Agriculture, Forestry and Fisheries, and Royal Agricultural University, Cambodia	USAID Feed the Future IPM Innovation Laboratory in South/SE Asia – improve vegetable and mango production
S Miller and D Francis (OSU HCS), S Culman (OSU SENR) D Mamiro and E Mbega, Sokoine Univ of Agriculture, Fed Beed, D Coyne, IITA, USAID iAGRI/Borlaug U.S. Graduate Student Fellowship	Improved soil health and germplasm to advance tomato production in Tanzania
S Miller, M Lewis Ivey and J LeJeune (FAO), G Rajashekara (OSU FAHRP), A Hoet (OSU Vet Prev Med) and Sanja Ilic (OSU Human Sciences)	United Nations FAO – Data acquisition, knowledge synthesis, and information transfer on mitigation of antimicrobial resistance in the food environment of low- and middle-income countries of SE Asia and Sub-Saharan Africa
S Miller and G Rajashekara (OSU FAHRP), X Xu, Beijing Vegetable Research Institute, China	Development and use of novel small molecule and imaging technologies to improve management options for bacterial diseases of vegetable crops
P Paul and collaborators at Escola Superior de Agricultura Luiz de Queiroz (ESALQ), University of Sao Paulo, Brazil and Empresa Brasileiro de Pesquisa Agropecuaria (Emprapa)	Meta-analytic modeling of relationships between soybean tar spot and yield and fungicide efficacy and economic benefit
J Slot and P Chaverri, University of Costa Rica	NSF Dimensions of Biodiversity - Secondary metabolites as drivers of fungal endophyte community diversity
J Slot and J Hoof, Technical University of Denmark	Synthetic biology for natural product discovery in Atheliaceae
L Stewart, M Redinbaugh, P Paul and collaborators in East Africa and Mexico (CIMMYT). Bill & Melinda Gates Foundation	Understanding and preventing seed transmission of maize chlorotic mottle virus
L Stewart, M Redinbaugh and Kwang-Ho Kim, RDA Korea. SDA-ARS RDA/Korea agreement	Developing a dispersal model of viruliferous small brown planthopper (*Laodelphax striatellus*) vectoring plant viruses using ArcMap
L Stewart, M Redinbaugh, and collaborations with East African scientists/organizations in Kenya, Uganda, Rwanda, and Tanzania	Maize lethal necrosis research in East Africa
G-L Wang, T Mitchell, collaborators and students from sub-Saharan Africa. BBSRC (UK)-Bill & Melinda Gates Foundation	Durable rice blast resistance through genomic analysis of the host-pathogen interaction
G-L Wang and collaborators in South Korea	Rural Development Administration (RDA), South Korea-Identification of durable resistance genes and gene pyramiding effects to rice blast
G-L Wang and International Atomic Engergy Agency (IAEA)	Development of a rapid detection method of wheat blast
Y Xia and P Liu, X Liu, China	Novel chemical and microbial inducers of plant disease resistance for enhancing plant health and yield
Y Xia and H J Chaudhary, Pakistan	Beneficial microbes in improving plant growth and defense in diverse biotic and abiotic stress conditions
Y Xia and F Wu, China	Mechanism and application of companion plants in enhancing plant disease control
Y Xia and C Ziv, Israel	Mechanism and enhancement of plant cuticle for improving plant defense in different biotic and abiotic stress conditions

Appendix 16 - Plant Pathology Faculty Publications Resulting from International Collaborative Research (2015-2020).

Showalter DN, Saville RJ, Orton ES, Buggs RJA, **Bonello P**, Brown JKM. 2020. Resistance of European ash (*Fraxinus excelsior*) saplings to larval feeding by the emerald ash borer (*Agrilus planipennis*). Plants, People, Planet 2:41-46. – DOI: 10.1002/ppp3.10077.

López-Goldar X, Villari C, **Bonello P**, Borg-Karlson AK, Sampedro, L, Zas R (2019). Genetic variation in the constitutive defensive metabolome and its inducibility is geographically structured and largely determined by demographic processes in maritime pine. Journal of Ecology – DOI:10.1111/1365-2745.13159.

López-Goldar X, Villari C, **Bonello P**, Borg-Karlson AK, Sampedro, L, Zas R (2019). Inducibility of plant secondary metabolites predicts genetic variation in resistance against a key insect herbivore in maritime pine. Frontiers in Plant Science - Functional Plant Ecology – DOI: 10.3389/fpls.2018.01651.

Mukrimin M, Conrad AO, Kovalchuk A, Julkunen-Tiitto R, **Bonello P**, Asiegbu FO (2019). Fourier-transform infrared (FT-IR) spectroscopy analysis discriminates asymptomatic and symptomatic Norway spruce trees. Plant Science – DOI: 10.1016/j.plantsci.2019.110247.

Villari C, Dowkiw A, Enderle R, Ghasemkhani M, Kirisits T, Kjaer E, Marčiulynienė D, McKinney L, Metzler B, Muñoz F, Rostgaard Nielsen L, Pliūra A, Stener L-G, Suchockas V, Rodriguez-Saona L, **Bonello P**, Cleary M (2018). Advanced spectroscopy-based phenotyping offers a potential solution to the ash dieback epidemic. Nature Scientific Reports 8:17448 – DOI:10.1038/s41598-018-35770-0.

Pepori AL, Michelozzi M, Santini A, Cencetti G, **Bonello P**, Gonthier P, Sebastiani F, Luchi N (2018). Comparative transcriptional and metabolic responses of *Pinus pinea* to a native and a non-native *Heterobasidion* species. Tree Physiology 39: 31-44. **Issue cover.**

Fayyaz A, **Bonello P**, Tufail MR, Amrao L, Habib A, Talib Sahi ST (2018). First report of citrus withertip (tip dieback), a disease complex caused by *Colletotrichum siamense* and *Lasiodiplodia iraniensis* on *Citrus reticulata* cv. Kinnow in Punjab, Pakistan. Plant Disease DOI: 10.1094/PDIS-04-18-0576-PDN.

Klutsch, JG, Najar A, Sherwood P, **Bonello P**, Erbilgin N (2017). A native parasitic plant mediates jack pine chemical defenses against *Grosmannia clavigera*, a fungal symbiont of mountain pine beetle. Journal of Chemical Ecology 43: 506-518.

Klass, T. L., Hayes, M. M., Seng, K. H., An, C., Rotondo, F., Shoaf, W. W., Ong, S., Tho, K. E., Allen, C., **Miller, S. A.** and **Jacobs, J. M**. 2020. First report of bacterial wilt of tomato caused by *Ralstonia pseudosolanacearum* (*Ralstonia solanacearum* phylotype 1) in Cambodia. Plant Dis. https://doi.org/10.1094/PDIS-09-19-1823-PDN

Piepho, H.-P., **Madden, L.V**., and Williams, E.R. 2015. Multiplicative interaction in network meta-analysis. *Statistics in Medicine* 34: 582-594.

Madden, L.V., Piepho, H.-P., and Paul, P.A. 2016. Statistical models and methods for network meta-analysis. *Phytopathology* 106: 792-806.

Piepho, H.-P., **Madden, L. V**., Roger, J., Payne, R., and Williams, E. R. 2018. Estimating the variance for heterogeneity in arm-based network meta-analysis. *Pharmaceutical Statistics* 17: 264-277.

Piepho, H.-P., **Madden, L. V**., and Williams, E. R. 2018. Contribution to the discussion of the paper by Jackson and White: Using general-purpose GLMM software for meta-analysis. *Biometrical Journal* 60: 1059-1061.

Madden, L. V., Hughes, G., Bucker Moraes, W., Xu, X.-M., and Turechek, W. W. 2018. Twenty-five years of the binary power law for characterizing heterogeneity of disease incidence. *Phytopathology* 108: 656-680.

Jeger, M. J., **Madden, L. V.**, and van den Bosch, F. 2018. Plant virus epidemiology: Applications and prospects for mathematical modeling and analysis to improve understanding and disease control. *Plant Disease* 102: 837-854.

Jeger, M. J., Stevenson, K. L., and **Madden, L. V**. 2017. Plant disease epidemiology. *Oxford Bibliographies.* http://oxfordbibliographiesonline.com/. (DOI: 10.1093/OBO/9780199830060-0166).

Sanabria-Velazquez, A. D., Testen, A. L., Enciso, G. A., Soilan, L. C. and **Miller, S. A**. 2019. Effects of anaerobic soil disinfestation on *Sclerotinia sclerotiorum* in Paraguay. Plant Health Progress 20:50-60.

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