Brothers, Sheila C

From: Schroeder, Margaret <m.mohr@uky.edu>
Sent: Wednesday, January 28, 2015 11:11 AM
To: Brothers, Sheila C; Hippisley, Andrew R
Subject: Dual Degree Pgm with Universidade Federal de Vicosa (Plant Path)
Attachments: PlantPathologyDualDegree_1_19_15.pdf

Dual Degree Pgm with Universidade Federal de Vicosa (Plant Path)

This is a recommendation that the University Senate approve the establishment of a new Dual Degree Program with Universidade Federal de Vicosa (Plant Pathology) in the Department of Plant Pathology within the College of Agriculture, Food, and Environment.

Please find the updated version of the proposal attached here, which includes 2 MOUs.

Please let me know if you need anything else.

Best-
Margaret

Margaret J. Mohr-Schroeder, PhD | Associate Professor of Mathematics Education | STEM PLUS Program Co-Chair | Department of STEM Education | University of Kentucky | www.margaretmohrschroeder.com

UNIVERSITY OF KENTUCKY
College of Agriculture, Food and Environment

Department of Plant Pathology
University of Kentucky
201F Plant Science Building
1405 Veterans Drive
Lexington, KY 40546

October 13, 2014

Dear Colleagues,

This is a proposal for a dual degree program between the University of Kentucky (UK) Department of Plant Pathology and the Departamento de Fitopatologia at the Universidade Federal de Viçosa (UFV) in Brazil. Both are ranked among the top five similar departments in their respective countries. Students in the dual degree program will earn Doctoral degrees in Plant Pathology from both institutions by simultaneously completing the requirements of both programs. The advantages to the students include the unique ability to obtain advanced practical training and to develop cultural and language fluency in both the United States and Brazil, while the advantages to our respective departments include the ability to recruit academically superior students from both countries, and facilitation of research collaborations to focus on plant disease problems of mutual interest. Our departmental strengths are complementary, with UK specializing in the molecular and cellular biology of plant-microbe interactions, and UFV focused primarily on applied pathology and sustainable approaches to plant disease management. The participating faculty at UFV are fluent in English, and received their higher educations primarily in the US and Europe so they are uniquely suited for this type of collaborative educational endeavor.

To my knowledge, this is the first dual degree proposal at UK. Given this, we anticipate that there may be many questions. We have spent the past several years in continuous discussion with our colleagues at UK and at UFV, as well as with representatives of the UK Graduate School and also the UK International Center, and we hope at this point that we have addressed all of the major issues and obstacles. We are willing to listen to any questions or concerns, and hope sincerely that you will be able to help us to address them expeditiously, so that this proposal can become a reality. Having this program in place will put UK at the forefront of a new revolution in the internationalization of higher education. Already UFV has many such agreements with European universities, but so far there have been none brought to fruition with a US university. I sincerely hope that UK can be the first. Thank you for your attention to the enclosed document.

With best regards
Lisa Vaillancourt

Lisa Vaillancourt

Professor of Plant Pathology
Director of Graduate Studies

DUAL DOCTORAL DEGREE IN PLANT PATHOLOGY BETWEEN THE UNIVERSITY OF KENTUCKY AND THE UNIVERSIDADE FEDERAL DE VIÇOSA

Program Goal

This is a proposal for a dual Doctoral degree program between the University of Kentucky (UK) and the Universidade Federal de Viçosa (UFV) in Brazil. Students will acquire academic credits and develop part of the research for their Doctoral dissertations at the partner university. A stay of at least 12 consecutive months at the partner university will be required for the program. Students in the program will obtain Doctoral degrees in Plant Pathology from both UK and UFV. Students in the program will develop language skills in English and Portuguese, and become familiar with norms of the discipline in both countries. Students will fulfill the academic requirements of both institutions in order to obtain degrees from both. The goal is to prepare students to work across borders, in academic, government, or industry settings. Graduates of the program will be able to leverage resources from both countries to solve problems of mutual interest at the highest level.

Background and Rationale

Diseases of plants cause significant crop losses worldwide. Many plant diseases are cosmopolitan in their distribution, and many others are introduced to new regions and initiate epidemics each year. Plant Pathology (the study and management of plant disease) is, consequently, a global activity, and graduate education in this discipline should promote the development of a workforce that is diverse and globally-engaged. Employees that can function effectively across borders are in demand by business, academia, and government agencies. Graduate Plant Pathology programs in the United States (U.S.) attract talented students from all over the world. Fluency in English is an important goal for these international students, because English is the international language of science, and most scientists at the top levels are expected to communicate and publish in English and to follow the norms of scientific practice and inquiry that are emphasized in U.S. graduate programs. The participation of international students in U.S. Plant Pathology graduate programs certainly helps their U.S. counterparts to develop an expanded worldview. However, the U.S. graduate students typically have few opportunities to engage in the extended periods of study abroad that are necessary to develop practical fluency in another language and culture. Our goal is to strengthen and deepen the educational experiences of both U.S. and Brazilian Plant Pathology graduate students by instituting this dual degree program.

Brazil is a major agricultural producer and international supplier of agricultural commodities. It also represents a huge market for U.S. agricultural products and technology. Brazil is one of the rapidly growing BRIC economies, and it has invested heavily in biotechnological innovation, including in the area of biofuels where it is a recognized world leader. Most of the major multinational agricultural corporations have significant presences in Brazil, and the U.S. government is increasingly involved in partnerships with the country to promote our common interests. Brazil has an active research community working in support of its agricultural enterprise. The state sponsored universities and research institutes are extremely well equipped and staffed with a highly educated workforce. Brazil is a geographically, culturally, and economically diverse country that offers a unique international experience for U.S. students. Educational exchanges are likely to be mutually beneficial for U.S. and Brazilian researchers, and to lead to faster progress in solving problems of mutual interest.

UFV was established in 1926 based on the U.S. land grant college model, and its educational system is similar to that of U.S. universities. Its first president was Dr. Peter Henry Rolfs, originally from the University of Florida, who established UFV's long tradition of collaboration with international institutions. UFV has played a major role in the development of Brazilian agriculture. It has trained several generations of plant and agricultural scientists now working at other universities and at Embrapa, Brazil's largest agricultural research institution. UFV is consistently ranked as one of the top agricultural schools in Brazil. Furthermore, UFV provides a welcoming environment for international students: students from dozens of countries in North and South America, Europe, and Asia study there each year. UK already has an extensive history of collaboration with UFV, and the UK International Center recently selected UFV as one of only nine foreign universities worldwide, and the only one in the Western hemisphere, to be a key partner in future internationalization initiatives. In addition to individual faculty research collaborations that have included graduate student visits of up to one year in duration and visiting faculty exchanges, undergraduate students from the Department of Biosystems and Agricultural Engineering (BAE) at UK have been traveling to UFV for nearly a decade to take classes and to obtain cultural exposure during a semester abroad. Their experience has been uniformly excellent.

The Department of Plant Pathology (Departamento de Fitopatologia) at UFV consists of 18 faculty members engaged in a broad range of basic and applied research (http://www.dfp.ufv.br/). The faculty has an excellent international reputation, and a collective research focus on disease management, particularly via sustainable methods e.g. biological control. Abbreviated CVs for faculty who would be involved in the dual degree program are included in **APPENDIX 1**. Note that most of the faculty earned their Ph.D. degree at a U.S. or European university, and all

participating faculty have research experience in the U.S. or Europe and are fluent in English. The department is housed in a modern building on the UFV campus that is well equipped for all types of research, including access to some facilities (e.g. an electron microscopy unit) that Plant Pathology researchers at UK lack. The curriculum offered by the department is very traditional, including foundational laboratory courses (i.e. applied plant mycology, nematology, virology, and bacteriology) that have been discontinued (primarily due to limitations in funds and teaching lab space) at UK and many other U.S. universities. These laboratories offer an opportunity for our dual degree students to obtain a level of practical training in Plant Pathology that is currently unavailable at UK.

The Department of Plant Pathology at UK has consistently been ranked among the top five departments for Plant Pathology research in the United States (http://www2.ca.uky.edu/agcollege/plantpathology/index.html). It is a relatively small department (11 faculty members), split between basic research and extension. Both groups participate in graduate teaching. Coursework in the department is focused on developing critical thinking, research, and communication skills. The research faculty members are internationally known for their basic studies of the mechanisms of plant-microbe interactions, and they attract talented graduate students from all over the world. The outstanding extension faculty members are engaged mostly in applied disease management research that is focused on the needs of Kentucky growers, and some of them have extensive international experience in their own right. Their ability to advise graduate students is limited because their extension duties require significant amounts of travel and time devoted to grower and agent training. As a result, the department currently serves students interested in basic molecular or cellular research extremely well, but it is not as well equipped for students who are more interested in applied research and disease management.

These two strong departments complement one another very well in their respective strengths and resources. The dual degree student would be able to draw on the particular strengths of both in order to obtain a well-rounded education in Plant Pathology, as well as a working familiarity with a broad range of crops and diseases, and with both cultures and languages. We anticipate that graduates of this program would be highly competitive for jobs in both the U.S. and Brazil.

Curriculum

The recommended core curriculum for the dual degree program provides a rigorous and comprehensive education in both basic and applied Plant Pathology, with an emphasis on critical thinking, communication, and research methodologies. Brazilian students will be required to have an M.S. degree in Plant Pathology before entering the program (this is already the requirement for

entering Ph.D. students there). M.S. programs in Plant Pathology are rare in the U.S. and more than 95% of our domestic students come directly to our program from an undergraduate major in one of the natural sciences. Thus, an M.S. will not be required for the U.S. students. As a result, courses other than the core will vary somewhat for each student in the program. Additionally, individual dissertation advisory committees may choose (by majority vote) to waive some of these core requirements and replace them with other courses, if that seems to fit the student's background and goals better.

Core Courses for the Dual Degree: 24-25 hours (PPA are courses at UK, FIP are courses at UFV). Syllabi for these courses are included in **APPENDIX 2**.

Population Biology (1-3 credits) (PPA 641 (1 credit[1]) **OR[2]** FIP 680 (3 credits)

Disease Diagnosis (3 credits) (PPA 640)

Critical Research Methods (3 credits[3]) (PPA 600)

Physiology of Plant Health and Disease (3-4 credits) (FIP 701, **OR[2]** PPA 500 (3) **and** PPA 673 (1))

Mycology (3 credits) (FIP 610[4])

Bacteriology (3 credits) (FIP 640[4])

Virology (3 credits) (FIP 630[4])

Nematology (3 credits) (FIP 620)

Seminar (1 credit) (PPA 799)

A three-credit statistics course is a pre-requisite to the program, and can be taken concurrently.

1. The PPA course is currently listed at only one credit, based on class-meeting time per week, HOWEVER, it includes a substantial amount of work that is done outside the regular class period, and after review, UFV faculty agreed that it is equivalent in depth of coverage to FIP 680. An application will be made in the near future to increase the credits for this course.
2. After review by both UK and UFV Plant Pathology faculty, these courses or course combinations have been accepted as equivalent.
3. This course is currently listed at 2 credits but an application will be made in the near future to increase it to 3 credits, because of the significant amount of independent work it requires outside of class.
4. There are three courses that are currently offered for the UK degree (at least two of the three are required) that were not considered equivalent by UFV for their degree, because they do not include laboratories. These courses are PPA 650 (Mycology), PPA 670 (Plant Bacteriology) and PPA 671 (Advanced Plant Virology). The corresponding UFV courses (FIP 610, 630, and 640) contain similar lecture material PLUS laboratory exercises, and thus we consider them to be acceptable substitutes for our own courses in these areas for the dual degree students. Because our degree is a more research-intensive degree than the typical UFV (non-dual) degree, our **non-dual** degree students are able to obtain sufficient laboratory experience and training during the process of conducting their dissertation research.

Typical (existing) program for a **non-dual degree** U.S. student entering with a B.S. in Plant Science:

Yr:Semester	1:1	1:2	2:1	2:2	3:1	3:2	4:1	4:2
Classes	PPA 400G[1]	PPA 600	PPA 640	PPA 650	Electives	QUALS	PPA 767	PPA 767
	PPA 500	PPA 794	PPA 641	PPA 670 **OR** PPA 671	PPA 794	PPA 767		
	PPA 794	PPA 799	PPA 673	PPA 794				
			PPA 794					
Total Graduate Credit	6	9	9	9	9	2	2	2

1. If the student has taken a Plant Pathology course previously they will not need to take PPA 400G. PPA 400G does not count toward the total required credits for the PhD degree.

An example of the program for a U.S. student entering the **dual degree** program with a B.S. in Plant Science. Shaded boxes indicate time spent at UFV.

Yr:Semester	1:1	1:2	2:1	2:2[3]	3:1	3:2	4:1	4:2
Classes	PPA 400G[1]	PPA 600	PPA 640	FIP 630	FIP 610	QUALS	PPA 767[6]	PPA 767
	PPA 500	A&S 103[2]	PPA 641	FIP 640	FIP 620	PPA 767		
	PPA 794	PPA 794	PPA 673	PPA 794[4]	PPA 794			
		PPA 799	A&S 104[2]					
			PPA 794					
Total Graduate Credit	6	9	9	9[5]	9	2	2	2

1. If the student has taken a Plant Pathology course previously they will not need to take PPA 400G. PPA 400G does not count toward the total required credits for the PhD degree.
2. Portuguese levels 1 and 2: These courses are currently being offered by the Department of Hispanic Studies on a trial basis. In addition to taking these courses if available, the students will improve their conversational abilities by engaging with their visiting Brazilian counterparts in the dual degree program. If the courses are not available, the students would benefit from taking Spanish language courses instead.
3. The student will enroll in a noncredit six-week intensive Portuguese course upon arrival in Brazil in January.
4. PPA 794 is Dissertation Research. The student will receive credit for this course based on their independent research performed in the host laboratory. This research will be part of a collaborative project between the host laboratory and the student's home laboratory, and will comprise part of the student's dissertation.
5. Nine credits for the FIP courses will be transferred, the maximum allowable.
6. Post-qualifying research credit.

Typical (existing) program for a **non-dual degree** Brazilian student entering UFV with a M.S. in Plant Pathology: **Guidelines for the Ph.D. degree at UFV are included in APPENDIX 3.**

Yr:Semester	1:1	1:2	2:1	2:2	3:1	3:2	4:1	4:2
Classes	FIP 701	FIP 630	FIP 610	PPA 680	FIP 797[4]	QUALS	Research	Research
	FIP 603[2]	FIP 640	FIP 620	FIP 704[3]	Research[5]	Research		
Total Graduate Credit	8	6	6	6	2	0	0	0

1. A total of at least 24 credits is required for completion of the degree at UFV for a student who enters with an M.S. (APPENDIX 3).
2. FIP 603: Clinica de Doencas de Plantas, Plant Disease Clinic (Disease Diagnosis).
3. FIP 704: Metodos em Fitopatologia Molecular (Methods in Molecular Phytopathology). This class covers techniques that are also discussed in PPA 660, but with much less emphasis on critical analysis of publications.
4. Student seminar. Analogous to our PPA 799.
5. Dissertation research. Not associated with a course number and not awarded credits at UFV. Analogous to our PPA 794 and PPA 767.

An example of the **dual degree** program for a Brazilian student[1]. Shaded boxes indicate time spent at UK.

Yr:Semester	1:1	1:2	2:1	2:2	3:1	3:2	4:1	4:2
Classes	FIP 701	FIP 630	FIP 610	PPA 600	PPA 640	QUALS	PPA 749	Research
	PPA 680	FIP 640	FIP 620	PPA 794	PPA 794	PPA 767		PPA 767
				Elective	PPA 799	Research		
Credit				9 UK credit	9 UK credit	2 UK credit	0 UK credit	2 UK credit

1. UFV students will be required to have completed a M.S. before beginning the dual degree Doctoral program. This will substitute for one year of the required pre-qualifying residency for the UK degree. Prior to coming to UK they would need to achieve a score of 79 or higher on the TOEFL.

Student Learning Outcomes for the Dual Degree

1. Students will demonstrate technical mastery of the core information and principles of the discipline, including essential factual information, historical context, current literature and issues, practical applications, and professional ethics.
2. Students will demonstrate abilities to think critically, solve problems, work collaboratively, use technology (including information technology) effectively, and develop and carry out high quality, hypothesis driven research.

3. Students will demonstrate mastery of oral and written scientific communication in English.

Student Learning Outcomes As Addressed in Core Courses

Title	Course	Objective
Population Biology	PPA 641, OR FIP 680	Describe how plants and associated microorganisms behave and evolve in populations, including concepts of selection and gene flow. **1,2**
Disease Diagnosis	PPA 640	Be able to diagnose diseases caused by major groups of pathogens including fungi, viruses, bacteria, nematodes, and abiotic causes, using the scientific method. **1,2,3**
Critical Research Methods	PPA 600	Be able to access information from the literature, and critically evaluate and apply that information. Be able to design statistically valid experiments and interpret the data from those experiments. Be able to write persuasively and make logically sound arguments in scientific papers in English. **1,2,3**
Physiology of Plant Health and Disease	PPA 500 and PPA 673, OR FIP 701	Explain and predict how disease affects the normal physiology of the host plant. Describe the genetics and physiology of plant resistance to pathogens, and predict the performance of resistance sources over time when they are deployed in the field. **1,2**
Mycology	FIP 610	Be able to identify major groups of fungi in culture and/or *in planta*, describe the major types of diseases caused by fungi, explain how fungal lifes cycles and structures relate to their pathogenicity to plants and to disease management. **1,2**
Bacteriology	FIP 640	Be able to identify major groups of bacteria in culture and/or *in planta*, describe the major types of diseases caused by bacteria, explain how bacterial life cycles, traits and behaviors relate to their pathogenicity to plants and to disease management. **1,2**
Nematology	FIP 630	Be able to identify major groups of plant-pathogenic nematodes. Describe the major types of diseases caused by nematodes, explain how nematode life cycles, traits, and behaviors relate to their pathogenicity to plants and to disease management. **1,2**
Virology	FIP 620	Be able to identify major groups of viruses, describe the major types of diseases caused by viruses, explain how viral traits and behaviors relate to their pathogenicity to plants and to disease management. **1,2**
Seminar	PPA 799	Display oral communication skills in the English language, including organization and presentation of background information and research findings, and delivery of a logical, evidence-based argument. **1,2,3**

Research	PPA 794	Develop and carry out high quality, hypothesis driven research. **1,2,3**

Doctoral Advisory Committee

The doctoral advisory committee will include one or more members from the partner institution, who will host the student in their laboratory(s) during their exchange. The student will have annual committee meetings, with all committee members attending either in person or via the internet, e.g. Skype. During the first committee meeting, a plan of coursework and travel will be presented, as well as a general overview of the research to be undertaken. For the second committee meeting, the student will prepare a literature review (in English) that will eventually form the first chapter of their dissertation. UFV faculty members who participate on these joint advisory committees will be added to the faculty roster of the UK Graduate School, after their credentials have been verified accordingly. Likewise, UK faculty participating in the dual degree program will be designated as adjunct faculty of UFV in accordance with their established process. This has already been successfully achieved for several faculty in Biosystems and Agricultural Engineering from UFV and from UK.

Graduate Degree Requirements

Qualifying Examination

Each student will be required to pass a written and an oral qualifying examination before he or she may be admitted to candidacy for the dual doctoral degree. The existing process for the qualifying examination at both institutions is similar. The qualifying examination for the dual degree students will be administered jointly by all the members of the student's advisory committee, and will take place in the student's home department. The qualifying examination will emphasize knowledge in the discipline contained within the core courses, as well as critical thinking and logic, and oral and written communication. Members of the committee from the partner institution will attend the oral examination in person, if possible, but if not possible they may attend the examination via Skype or similar electronic means. The examination will be given primarily in English, although it will be permissible for Brazilian committee members to translate questions and answers for the Brazilian students and for the UK professors participating, as necessary, to ensure that the questions and answers are clear to all parties.

Doctoral Dissertation

Each student must write a dissertation based on original research. It is anticipated that dual degree students will be involved in joint research projects between laboratories at both universities. Thus, some of the work for the dissertation will be completed at the partner university and some at the home university. The dissertation will be written in English, with summaries written in both English and Portuguese. The dissertation will be defended at the home institution, in the presence of all members of the joint advisory committee, and it must meet or exceed the usual expectations for dissertations, in terms of both quantity and quality of research, at both institutions. Members of the committee from the partner institution will attend in person, if possible, but if not possible they may attend the examination via Skype or similar electronic means. For Brazilian students defending in Brazil, UK will appoint an outside examiner, consistent with UK Graduate School policy, and the outside examiner may also attend the examination via Skype or similar electronic means. All students will be expected to defend their dissertation in English.

It may not be clear why the dissertation should be written and defended in English, which seems to disadvantage the Brazilian students relative to the U.S. students. This is because an important goal of the dual degree program is to have the Brazilian students develop their skills in English to a level that is sufficient to engage readily in both oral and written scholarly communication in our discipline. English is the international language of science, and it will be very important and advantageous for the Brazilian students to have the high level of English language skill that is demonstrated by writing their dissertation and defending it in English. The Department of Plant Pathology at UFV has already been moving in the direction of having all their students write their dissertations in English. Since all of the participating UFV faculty members have an excellent command of the English language, this will not be a problem. Although it would be desirable for the U.S. students to achieve a similar level of ability in Portuguese, this will not be a requirement of the degree. Some of the U.S. students may already have Portuguese, or more commonly Spanish language skills, when enrolling. They will take one or more introductory Portuguese language courses at UK if these are available (there are two, A&S 103 and A&S 104, currently being offered on a trial basis through the Department of Hispanic Studies). UFV also offers a noncredit six-week "immersion" course in the Portuguese language and Brazilian culture for all new international students each January. The dual degree U.S. students will be required to take this class when they arrive in Brazil for their 12-month exchange. The U.S. students at UFV will be permitted to conduct all of their formal course assessments (tests, written papers) in English (confirmed by the letter from the UFV Director of Graduate Studies, **APPENDIX 4**). Because the participating faculty and many of the Brazilian graduate students speak English well, we don't anticipate that our U.S. students will

have significant language difficulties with their class or laboratory work. Even a relatively modest level of language proficiency achieved by our U.S. students will be highly advantageous when competing for jobs that involve travel to Brazil and/or collaboration with Brazilian counterparts.

The U.S. and Brazilian dual degree students will fulfill all of the existing requirements for the Plant Pathology degree at UK. These requirements include: completion of four residency semesters prequalifying and two residency semesters postqualifying; successful completion of all core course requirements (unless waived by the student's committee); passing a written and oral qualifying examination, presentation of three seminars, one of which will be graded as PPA 799; and completion and defense of a dissertation based on original independent research. U.S. students will transfer a total of 9 credits from UFV toward their degree. According to Graduate School regulations, up to 25% of the total pre-qualifying credits earned can be transferred. As UK allows, the M.S. will replace two of the four prequalifying semesters for the Brazilian students. Brazilian students will obtain the other two prequalifying semesters during their stay at UK. They will do one of their three required seminars, in English, during their stay at UK. This is the seminar that will be graded for the required PPA 799 course. They will do the other two seminars (one of which will be their exit seminar) in Brazil, and these seminars will be broadcast over the internet so that all committee members and interested department members at UK can attend. Their final seminar will be in English, but the first seminar could be in either Portuguese or English. Brazilian students will register in absentia for at least two postqualifying semesters of PPA 767, including the semester they take their qualifying exams and the semester they defend, and they will register in PPA 749 for 0 credits for the remainder so that they will not need to pay tuition. In Brazil, students are fully supported by the government for up to four years and they attend school tuition-free during that time. Unlike UK, UFV does not have specific residency requirements. UFV will consider that the U.S. students have met their requirements for their Doctoral degree if they complete the core courses (unless waived by the student's committee), and complete and defend a dissertation based on original independent research.

With the exception of the transfer courses, and the co-supervision of doctoral theses, the program of study for Brazilian students at UK contains exactly the same elements as for current doctoral students in Plant Pathology who enter with a Masters degree or the equivalent.

Additional procedures, requirements and policies

Selection procedures

Admission requirements for each university will be the same as those for regular (non-dual degree) students. Brazilian students will be required to have a M.S. in Plant Pathology or a related discipline before embarking on Doctoral studies. Most U.S. students probably will not have a M.S., as this is less common in the U.S. English proficiency will be required for Brazilian candidates, who will need to receive a score of 78 or higher on the Test of English as a Foreign Language (TOEFL) in order to enroll in the UK graduate program. A similar level of Portuguese proficiency is not required by UFV for U.S. candidates, but these candidates would be expected to enroll in Portuguese language classes at UK, if available, (e.g. A&S 103, 104), and spend some time improving their conversational abilities with their Brazilian dual degree colleagues and by self-study prior to traveling to Brazil. Once in Brazil, the U.S. students will be required to enroll in the accelerated language course offered for all international students by that University.

Attendance at the partner university

Each student must spend at least one continuous year (12 months) of their program at the partner institution prior to their qualifying examinations. During this year they will engage in a combination of course work and research. The research will usually be part of their dissertation research. Students may also travel to the other country for shorter periods post-qualifying, as funds allow, in order to perform parts of their own research in a field or lab setting there.

It is anticipated that the majority of students in the program will be involved in joint research projects between labs at UK and UFV. There are many areas of potential collaboration between the respective faculties, and various sources of funding from U.S. and Brazilian agencies that could be applied for. In this regard, it is important to point out that plant diseases that are common in Brazil, with its much greater diversity of climates, biodiversity, and cropping systems, have the potential to seriously impact U.S. agriculture if they are introduced here. One good example is soybean rust, which has been a serious problem in Brazil for many years before it was introduced to the southern U.S. Another example is wheat blast, which is causing significant damage in Brazil currently and was detected in the U.S. for the first time right here in Kentucky last year. U.S. funding agencies or private companies should be willing to fund joint research if it involves pathogens that are currently present in Brazil and that threaten U.S. agriculture in the future. It is hoped that the presence of the dual degree program will result in increased levels of research funding for both institutions from both governments.

APPENDIX 1

Abbreviated CVs (in English) of UFV Faculty who would be involved in the dual degree.

List of Faculty:

Robert Weingart Barreto
Sérgio Hermínio Brommonschenkel
Claudine Márcia de Carvalho
Leandro Grassi de Freitas
Eduardo Seiti Gomide Mizubuti
José Rogério de Oliveira
Emerson Medeiros del Ponte
Fabrício de Ávila Rodrigues
Francisco Murilo Zerbini Júnior

Curriculum Vitae

Robert Weingart Barreto

Viçosa Federal University
Department of Plant Pathology
Laboratory of Mycology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 2503
Tel. (Lab): +51 3 899 2625
Fax: +55 31 3 899 2240
Email: rbarreto@ufv.br

Education and Training

M.Sc. In Pure and Applied Taxonomy, University of Reading, Berkshire, U.K., 1986

Ph.D., Botany, University of Reading, Berkshire, U.K., 1996

Post Ph.D, Centraalbureau voor Schimmelcultures, Utrecht, NL, 2011

Publications in Refereed Journals (from 2010 to 2014)

Coutinho FMF, Macedo DM, Barreto RW (2014) First report of gray mold (*Amphobotrys ricini*) on copperleaf (*Acalypha wilkesiana*) in Brazil. Plant Disease 98:276-276.

Miranda BC, Cardoso A, Barreto RW (2014). First Report of *Rhizoctonia solani* AG-1-IB causing leaf blight of sorrel (*Rumex acetosa*) in Brazil. Plant Disease 98:278-278.

Duarte LL, Choi Y-J, Soares DJ, Barreto RW (2014) *Plasmopara invertifolia* sp. nov. causing downy mildew on *Helichrysum bracteatum* (Asteraceae). Mycological Progress 13:285-289.

Guatimosim E, Pinto HJ, Barreto RW, Prado J (2014) *Rhagadolobiopsis*, a new genus of Parmulariaceae from Brazil with a description of the ontogeny of its ascomata. Mycologia 106:276-281.

Colman A, Silva RA, Alves R, Silva M, Barreto RW (2014) First report of causing leaf spots on in Brazil. Plant Disease 98:849-849.

Guatimosim E, Schwartsburd PB, Barreto RW (2014) A new *Inocyclus* species (Parmulariaceae) on the neotropical fern *Pleopeltis astrolepis*. IMA Fungus 5:51-55.

Colman A, Macedo DM, Barreto RW (2014) First report of downy mildew (*Hyaloperonospora lunariae*) on white mustard (*Sinapis alba*) in Brazil. Plant Disease 98:1007-1007.

Lima RD, Santin AM, Seni DJ, Dietrich A, Salazar LA, Subbotin AS, Mundo-Ocampo M, Goldenberg R, Barreto RW (2013) *Ditylenchus gallaeformans* sp. n. (Tylenchida: Anguinidae) a neotropical nematode with biocontrol potential against weedy Melastomataceae. Nematology 15:179-196.

Curriculum Vitae

Sérgio Hermínio Brommonschenkel

Viçosa Federal University
Department of Plant Pathology
Laboratory of Host Resistance
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 2938
Tel. (Lab): +51 3 899 3335
Fax: +55 31 3 899 2240
Email: shbromo@ufv.br

Education and Training

B.A., Agronomy, Viçosa Federal University, 1984

M.Sc. Plant Pathology, Viçosa Federal University, 1988

Ph.D., Plant Breeding and Genetics, Cornell University, Cornell, U.S.A., 1995

Publications in Refereed Journals (from 2010 to 2014)

Myburg AA, Grattapaglia D, Tuskan GA, Hellsten U, Hayes RD, Grimwood J, Jenkins J, Lindquist E, Tice H, Bauer D, Goodstein DM, Dubchak I, Poliakov A, Mizrachi E, Kullan ARK, Hussey SG, Pinard D, Merwe KV-D, Singh P, Jaarsveld IV, Silva-Junior OB, Togawa RC, Pappas MR, Faria DA, Sansaloni CP, Petroli CD, Yang X, Ranjan P, Tschaplinski TJ, Ye C-Y, *et al*. (2014) The genome of *Eucalyptus grandis*. Nature 510:356-362.

Pereira JF, Almeida APMM, Cota J, Pamphile JÁ, Ferreira-Silva G, Araujo EF, Gramacho KP, Brommonschenkel SH, Pereira GAG, Queiroz MV (2012) Boto, a class II transposon in *Moniliophthora perniciosa*, is the first representative of the PIF/Harbinger superfamily in a phytopathogenic fungus. Microbiology 159:112-125.

Alves AA, Faria DA, Grattapaglia D, Alfenas AC, Lau D, Guimarães, LMS, Brommonschenkel SH, Rosado CCG (2011) Genetic mapping provides evidence for the role of additive and non-additive QTLs in the response of inter-specific hybrids of *Eucalyptus* to *Puccinia psidii* rust infection. Euphytica 183:27-38.

Ruiz JCD, Silva V, Ali A, Pinto A, Santos AC, Rocha AR, Lopes AAMC, Dorella DO, Pacheco FA, Costa LGC, Turk MP, Seyffert MZ, Moraes N, Soares PMRO, Almeida SC, Castro SS, Abreu TLP, Trost VAC, Baumbach E, Tauch J, Schneider A, Mcculloch MPC, Cerdeira J, Ramos LT, Rommel TJ, *et al*. (2011) Evidence for reductive genome evolution and lateral acquisition of virulence functions in two *Corynebacterium pseudotuberculosis* strains. Plos One 6:e18551.

Lourenço-Junior, V, Rodrigues TTMS, Campos AMD, Bragança CAD, Scheuermann KK, Reis A, Brommonschenkel SH, Maffia LA, Mizubuti ESG (2011) Genetic structure of the population of *Alternaria solani* in Brazil. Journal of Phytopathology 159:233-240.

Curriculum Vitae

Claudine Márcia de Carvalho

Viçosa Federal University
Department of Plant Pathology
Laboratory of Virology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 1087
Tel. (Lab): +51 3 899 1096
Fax: +55 31 3 899 2240
Email: claudine.carvalho@ufv.br

Education and Training

B.A., Agronomy, Lavras Federal University, 1997

M.Sc. Plant Pathology, Lavras Federal University, 1999

Ph.D., Plant Virology, Wageningen University, Wageningen, NL, 2003

Post Ph.D., Oxford Brookes University, Brookes, U.K., 2006

Post Ph.D., Viçosa Federal University, 2008

Publications in Refereed Journals (from 2010 to 2014)

Carvalho SL, Silva FN, Zanardo LG, Almeida AMR, Zerbini FM, Carvalho CM (2013) Production of polyclonal antiserum against *Cowpea mild mottle virus* coat protein and its application in virus detection. Tropical Plant Pathology 38:49-54.

Zanardo LG, Silva FN, Bicalho AAC, Urquiza GPC, Lima ATM, Almeida AM, Zerbini FM, Carvalho CM (2013) Molecular and biological characterization of *Cowpea mild mottle virus* isolates infecting soybean in Brazil and evidence of recombination. Plant Pathology 63:n/a-n/a.

Zanardo LG, Silva FN, Lima ATM, Milanesi DF, Castilho-Urquiza GP, Almeida AMR, Zerbini FM,, Carvalho, C. M. . Molecular variability of *Cowpea mild mottle virus* infecting soybean in Brazil. Archives of Virology 158:1432-8798.

Souza NA, Silva FN, Bedendo IP, Carvalho CM (2013) A phytoplasma belonging to a 16SrIII-A subgroup and dsRNA virus associated with cassava frogskin disease in Brazil. Plant Disease: 98:771-779.

Osterrieder A, Hummel E, Carvalho CM, Hawes C (2010) Golgi membrane dynamics after induction of a dominant-negative mutant Sar1 GTPase in tobacco. Journal of Experimental Botany 61:405-422.

Curriculum Vitae

Leandro Grassi de Freitas

Viçosa Federal University
Department of Plant Pathology
Laboratory of Nematology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 2925
Tel. (Lab): +51 3 899 2926
Fax: +55 31 3 899 2240
Email: leandro@ufv.br

Education and Training

B.A., Agronomy, Viçosa Federal University, 1987

M.Sc. Plant Pathology, Viçosa Federal University, 1991

Ph.D., Plant Pathology, University of Florida, Gainesville, U.S.A., 1996

Publications in Refereed Journals (from 2010 to 2014)

Viggiano JR, Freitas LG, Lopes EA (2014) Use of *Pochonia chlamydosporia* to control *Meloidogyne javanica* in cucumber. Biological Control 69:72-77.

Bontempo AF, Fernandes RH, Lopes J, Freitas LG, Lopes EA (2014) *Pochonia chlamydosporia* controls *Meloidogyne incognita* on carrot. Australasian Plant Pathology 43:421-424.

Dallemole-Giaretta R, Freitas LG, Xavier DM, Zooca RJF, Ferraz S, Lopes EA (2014) Incorporação ao solo de substrato contendo micélio e conídios de *Pochonia chlamydosporia* para o manejo de *Meloidogyne javanica*. Ciência Rural 44:629-633.

Kramer-Mello IN, Araújo JV, Braga FR, Avelar-Monteiro TS, Freitas LG, Araujo JM, Freitas-Soares FE (2013) Biological control of infective larvae of *Ancylostoma* spp. in beach sand. Revista Iberoamericana de Micología 30:1-10.

Dallemole-Giaretta R, Freitas LG, Cavallin IC, Marmentini GA, Faria CMDR, Resende JTV (2013) Avaliação de um produto à base de *Pochonia chlamydosporia* no controle de *Meloidogyne javanica* em alface e cenoura no campo. Nematropica 43:131-137.

Maciel AS, Freitas LG, Figueiredo LD, Campos AK, Mello INK (2012) Antagonistic activity of the fungus *Pochonia chlamydosporia* on mature and immature *Toxocara canis* eggs. Parasitology 1:1-12.

Ferreira PA, Ferreira PA, Neves WS, Lopes EA, Freitas LG, Ferraz S (2012) Efeito da fertilização e da nutrição de plantas sobre doenças causadas por nematoides. Revista Trópica - Ciências Agrárias e Biológicas 6:33-42.

Dallemole-Giaretta R, Freitas LG, Lopes EA, Pereira OL, Zooca RJF, Ferraz S (2012) Screening of *Pochonia chlamydosporia* Brazilian isolates as biocontrol agents of *Meloidogyne javanica*. Crop Protection 42:102-107.

Viggiano JR, Freitas LG, Ferreira PA (2012) Resíduo da produção de *Pochonia chlamydosporia* no desenvolvimento de mudas e plantas de alface. Pesquisa Agropecuária Brasileira 47:983-990.

Neves WS, Freitas LG, Dallemole-Giaretta R, Coutinho MM, Ferraz S, Parreira DF (2012) Incorporação de farinha de semente de mamão ao solo para o controle de *Meloidogyne javanica*. Nematologia Brasileira 36:25-31.

Ferreira SR, Araújo JV, Braga FR, Araujo JM, Carvalho RO, Silva AR, Frassy LN, Freitas LG (2011) Ovicidal activity of seven *Pochonia chlamydosporia* fungal isolates on *Ascaris suum* eggs. Tropical Animal Health and Production 43:639-642.

Lopes EA, Ferraz S, Ferreira PA, Freitas LG, Dallemole-Giaretta R (2011) Soil amendment with chopped or ground dry leaves of six species of plants for the control of *Meloidogyne javanica* in tomato under greenhouse conditions. Ciência Rural 41:935-938.

Dallemole-Giaretta R, Freitas LG, Caixeta LB, Xavier DM, Ferraz S, Fabry CFS (2011) Produção de clamidósporos de *Pochonia chlamydosporia* em diferentes substratos. Ciência e Agrotecnologia 35, p. 314-321.

Dias-Arieira CR, Santana SM, Freitas LG, Cunha TPL, Biela F, Puerari HH, Chiamolera FM (2011) Efficiency of *Pochonia chlamydosporia* in *Meloidogyne incognita* control in lettuce crop (*Lactuca sativa* L.). International Journal of Food, Agriculture and Environment 9:561-563.

Bernardo JT, Freitas LG, Yamada JK, Almeida VS, Dallemole-Giaretta R, Ferraz S (2011) Efeito de adubos orgânicos sobre *Meloidogyne javanica* em tomateiro. Nematologia Brasileira 35:10-19.

Dallemole-Giaretta R, Ferraz S, Freitas LG, Podestá GS, Lopes EA, Agnes EL (2011) Cover crops and *Pochonia chlamydosporia* for the control of *Meloidogyne javanica*. Nematology 13:919-926.

Dallemole-Giaretta R, Freitas LG, Coutinho MM, Neves WS, Zooca RJF, Ferraz S (201) Efeito de farinha de sementes de abóbora e de *Pochonia chlamydosporia* no controle de *Meloidogyne javanica*. Nematologia Brasileira 34:91-97.

Dallemole-Giaretta R, Freitas LG, Zooca RJF, Caixeta LB, Lopes EA, Ferraz S (2010) Controle de *Meloidogyne javanica* por meio de aplicação de palha de café colonizada por *Pochonia chlamydosporia* var. *chlamydosporia*. Nematologia Brasileira 34:137-140.

Dallemole-Giaretta R, Freitas LG, Zooca RJF; Podestá GS, Caixeta LB, Ferraz S, Lopes EA (2010) Associação de *Pochonia chlamydosporia*, *Bacillus cereus* e fibra de coco no controle de *Meloidogyne javanica* em tomateiro. Nematologia Brasileira 4:18-22.

Gardiano CG, Dallemole-Giaretta R, Lopes EA, Zooca RJF, Ferraz S, Freitas LG (2010) Atividade nematicida de extratos de sementes de espécies de crotalária sobre *Meloidogyne javanica*. Revista Trópica - Ciências Agrárias e Biológicas 4:3-7.

Maciel AS, Freitas LG, Campos AK, Lopes EA, Araújo JV (2010) The biological control of *Ancylostoma* spp. dog infective larvae by *Duddingtonia flagrans* in a soil microcosm. Veterinary Parasitology 173:262-270.

Book and Book Chapters (from 2010 to 2014)

Ferraz S, Freitas LG, Lopes EA, Dias-Arieira CR (2010) Manejo Sustentável de Fitonematoides. Vol. 1. Editora UFV, Viçosa, MG. 304p.

Ferreira PA, Ferraz S, Freitas LG (2012) Sintomas causados por fitonematoides. In: Zambolim L, Jesus Junior WC, Pereira OL (Eds.). O Essencial da Fitopatologia - Agentes Causais. Vol. 1. Suprema Gráfica e Editora Ltda., Visconde do Rio Branco, MG. pp. 203-222.

Freitas LG, Oliveira RDL, Ferraz S (2012) Nematoides como Patógenos de Plantas. In: Zambolim L, Jesus Júnior WC, Pereira OL (Eds.). O Essencial da Fitopatologia - Agentes Causais. Vol. 2. Suprema Gráfica e Editora Ltda., Visconde do Rio Branco, MG. pp. 89-128.

Oliveira RDL, Freitas LG (2012) Métodos Empregados em Fitonematologia. In: Zambolim L, Jesus junior WC, Pereira OL (Eds.). O Essencial da Fitopatologia - Agentes Causais. Vol. 1. Suprema Gráfica e Editora Ltda., Visconde do Rio Branco, MG. pp. 355-376.

Freitas LG, Oliveira RDL, Ferraz S (2012) Identificação de Fitonematoides. In: Zambolim L, Jesus Junior WC, Pereira OL (Eds.). O Essencial da Fitopatologia - Agentes Causais. Vol. 1. Suprema Gráfica e Editora Ltda., Visconde do Rio Branco, MG. pp. 377-416.

Paiva JAP, Prat E, Vautrin S, Santos MD, San-Clemente H, Brommonschenkel SH, Fonseca PGS Grattapaglia D, Song X, Ammiraju JSS, Kudrna D, Wing RA, Freitas AT, Bergès H, Grima-Pettenati J (2011) Advancing *Eucalyptus* genomics: identification and sequencing of lignin biosynthesis genes from deep-coverage BAC libraries. BMC Genomics 12:137.

Lopes FJF, Pauly M, Brommonschenkel SH, Lau EY, Diola V, Passos JL, Loureiro ME (2010) The EgMUR3 xyloglucan galactosyltransferase from *Eucalyptus grandis* complements the mur3 cell wall phenotype in *Arabidopsis thaliana*. Tree Genetics & Genomes 6:745-756.

Varejão EVV, Demuner AJ, Barbosa LCA, Barreto RW, Veira BS (2013) Toxicidade de filtrados de cultura de *Alternaria euphorbiicola* em folhas de *Euphorbia heterophylla*. Planta Daninha 31:1-9.

Macedo DM, Pereira OL, Wheeler GS, Barreto RW (2013) *Corynespora cassiicola* f. sp. *schinii*, a potential biocontrol agent for the weed *Schinus terebinthifolius* in the United States. Plant Disease 97:496-500.

Varejão EVV, Demuner AJ, Barbosa LCA, Barreto RW (2013) The search for new natural herbicides strategic approaches for discovering fungal phytotoxins. Crop Protection 48:41-50.

Morais EGF, Picanço MC, Lopes-Mattos KLB, Bourchier RS, Alves Meira RMS, Barreto RW (2013) *Diclidophlebia smithi* (Hemiptera: Psyllidae), a potential biocontrol agent for *Miconia calvescens* in the Pacific: Population dynamics, climate-match, host-specificity, host-damage and natural enemies. Biological Control 66:33-40.

Alves JL, Woudenberg JHC, Duarte LL, Crous PW, Barreto RW (2013) Reappraisal of the genus *Alternariaster* (Dothideomycetes). Persoonia 31:77-85.

Rocha FB, Hanada RE, Albuquerque ST, Barreto RW (2013) *Pseudocercospora piperis* associated with leaf spots on *Piper aduncum* in Brazil. Australasian Plant Disease Notes 1:1-3.

Evans HC, Bezerra JL, Barreto RW (2013) Of mushrooms and chocolate trees: a etiology and phylogeny of witche's broom and frosty pod diseases of cacao. Plant Pathology 62:728-740.\

Quaedvlieg W, Verkley GJM, Shin H-D, Barreto RW, Alfenas AC, Swart WJ, Groenewald JZ, Crous PW (2013) Sizing up *Septoria*. Studies in Mycology 75:307-390.

Fernandes AF, Miranda BEC, Duarte LL, Barreto RW (2013) *Passalora stromatica* sp. nov. associated with leaf spots of *Tithonia diversifolia* in Brazil. IMA Fungus 4:201-204.

Augustin JO, Groenewald JZ, Nascimento RJ, Mizubuti ESG, Barreto RW, Elliot SL, Evans HC (2013) Yet more -weeds- in the garden: Fungal novelties from nests of leaf-cutting ants. Plos One 8:e82265.

Fowler SV, Barreto RW, Dodd S, Macedo DM, Paynter Q, Pedrosa-Macedo JH, Pereira OL, Peterson P, Smith L, Waipara N, Winks CJ, Forrester G (2013) *Tradescantia fluminensis*, an exotic weed affecting native forest regeneration in New Zealand: Ecological surveys, safety tests and releases of four biocontrol agents from Brazil. Biological Control 64:323-329.

Silva M, Freitas NM, Mendonca HL, Barreto RW (2013) First report of *Stagonosporiopsis cucurbitacearum* causing fruit rot of *Luffa cylindrica* in Brazil. Plant Disease 97:1120-1121.

Miranda BEC, Barreto RW, Crous PW, Groenewald JZ (2012) *Pilidiella tibouchinae* sp. nov. associated with foliage blight of *Tibouchina granulosa* (quaresmeira) in Brazil. IMA Fungus 3:1-7.

Costa LC, Macedo DM, Barreto RW (2012) Reappraisal and neotypification of *Phyllachora feijoae*. IMA Fungus 3:9-14.

Silva M, Barreto RW, Pereira OL (2012) Fungal pathogens of “cat’s claws” from Brazil for biocontrol of *Macfadyena unguis-cati*. Mycotaxon 119:181-195.

Silva M, Castañeda-Ruiz RF, Pereira OL, Barreto RW (2012) *Alveariospora*, a new anamorphic genus from trichomes of *Dimorphandra mollis* in Brazil. Mycotaxon 119:109-116.

Morais EGF, Picanço MC, Semeão AA, Barreto RW, Rosado JF, Martins JC (2012). Lepidopterans as potential agents for the biological control of the invasive plant, *Miconia calvescens*. Journal of Insect Science 12:1-17.

Schoch CL, Seifert KA, Huhndorf S, Robert V, Spouge JL, Levesque CA, Chen W, Bolchacova E, Voigt K, Crous PW, Miller AN, Wingfield MJ, Aime MC, An K-D, Bai F-Y, Barreto RW, Begerow D, Bergeron M-J, Blackwell M, Boekhout T, Bogale M, Boonyuen N, Burgaz AR, Buyck B, Cai L et al. (2012) From the Cover: Nuclear ribosomal internal transcribed spacer (ITS) region as a universal DNA barcode marker for Fungi. Proceedings of the National Academy of Sciences of the United States of America 109:6241-6246.

Passos JL, Barbosa LCA, Demuner AJ, Alvarenga ES, Silva CM, Barreto RW (2012) Chemical Characterization of volatile compounds of *Lantana camara* L. and *L. radula* Sw. and their antifungal activity. Molecules 17:11447-11455.

Barreto RW, Johnston PR, Crous PW, Evans HC (2012) A new species of the lenticel fungal genus *Claviradulomyces* (Ostropales) from the Brazilian Atlantic forest tree *Xylopia sericea* (Annonaceae). IMA Fungus 3:135-141.

Guatimosim E, Pinto HJ, Barreto RW (2012) *Passalora acrocomiae* sp. nov. and *Exosporium acrocomiae* from the palm *Acrocomia aculeata* in Puerto Rico. Mycotaxon 122:61-67.

Santana EA, Guatimosim E, Fuga CAG, Barreto RW (2011) First record of *Pyricularia grisea* causing leaf blight of *Costus spiralis* in Brazil. Australasian plant disease notes 5:1-8.

Soares DJ, Rocha FB, Duarte LL, Barreto RW (2011) *Pyriculariopsis calatheae* sp. nov., a novel anamorphic hyphomycete from the Atlantic forest of Brazil causing leaf spots on *Calathea longifolia*. Mycological Progress 10:315-321.

Carvalho CR, Fernandes RC, Carvalho GMA, Barreto RW, Evans HC (2011) Cryptosexuality and the genetic diversity paradox in coffee rust, *Hemileia vastatrix*. Plos One 6:e26387.

Guatimosim E, Fuga CAG, Pinto HJ, Barreto RW (2011) First report of gray mold caused by on yellow cosmos (*Cosmos sulphureus*) in Brazil. Plant Disease 95:1588-1588.

Evans HC, Barreto RW (2011) Embracing invasives: a view of compromise. Science 331:1383, 2011.

Vieira BS, Barreto RW (2010) Liquid culture production of chlamydospores of *Lewia chlamidosporiformans* (Ascomycota: Pleosporales), a mycoherbicide candidate for wild poinsettia. Australasian Plant Pathology 39:154-160.

Alves JL, Barreto RW, Pereira OL, Soares DJ (2010) Additions to the mycobiota of the invasive weed *Miconia calvescens* (Melastomataceae). Mycologia 102:69-82.
Citações:4|4

Alves JL, Barreto RW (2010) *Pseudocercospora ixoricola* causing leaf spots on *Ixora coccinea* in Brazil. Plant Disease 94:278-278.

Morais EGF, Picanco MC, Barreto RW, Silva NR, Campos MR (2010) Biological performance of *Diclidophlebia smithi* (Hemiptera: Psyllidae), a potential biocontrol agent for the invasive weed *Miconia calvescens*. Biocontrol Science and Technology 20:107-116.

Passos JL, Demuner AJ, Barbosa LCA Barreto RW, King-Diaz B, Lotina-Hennsen B (2010) Effects of *Corynespora cassiicola* on *Lantana camara*. Planta Daninha 28:229-237.

Almeida DB, Macedo DM, Barreto RW (2010) Leaf spot on *Clerodendrum speciosus* in Brazil caused by *Pseudocercospora clerodendricola* sp. nov.. Tropical Plant Pathology 35:170-173.

Morais EGF, Picanço MC, Barreto RW, Silva GA Moreno SC, Queiroz RB (2010) Biology of the leaf roller *Salbia lotanalis* and its impact on the invasive tree *Miconia calvescens*. BioControl 55:685-694.

Rocha FB, Barreto RW, Bezerra JL, Neto JAAM (2010) Foliar mycobiota of *Coussapoa floccosa*, a highly threatened tree of the Brazilian Atlantic forest. Mycologia 102:1240-1252.

Lima BV, Soares DJ, Barreto RW (2010) Inoculum density of *Plectosporium alismatis*, a potential mycoherbicide, in relation to control of the aquatic weed *Sagittaria montevidensis*. Tropical Plant Pathology 35:236-240.

Crous PW, Barreto RW, Alfenas AC, Alfenas RF, Groenewald JZ (2010) What is Johansonia? IMA Fungus 1:117-122.

Macedo DM, Pinho DB, Barreto RW, Pereira OL, Gusmão LFP, Cuda J (210) Black mildew fungi (Meliolaceae) associated with *Schinus terebinthifolius* (Brazilian pepper tree) in Brazil. Mycotaxon 114:429-437.

Book and Book Chapters (from 2010 to 2014)

Barreto RW, Ellison CA, Seier MK, Evans H (2012) Biological control of weeds with plant pathogens: Four decades on. In: Dharam P, Shankar AU (Eds.). Integrated Pest Management Principles and Practice. Vol. 1. CABI, Wallingford, UK. pp. 299-350.

Curriculum Vitae

Eduardo Seiti Gomide Mizubuti

Viçosa Federal University
Department of Plant Pathology
Laboratory of Population Biology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 1090
Tel. (Lab): +51 3 899 1086
Fax: +55 31 3 899 2240
Email: mizubuti@ufv.br

Education and Training

B.A., Agronomy, Viçosa Federal University, 1989

M.Sc. Plant Pathology, Viçosa Federal University, 1991

Ph.D., Plant Pathology, Cornell University, Cornell, U.S.A., 1998

Post Ph.D, Molecular Genetics of Microorganisms, Universidad de Valencia, Valencia, ES, 2006

Publications in Refereed Journals (from 2010 to 2014)

Santiago TR, Grabowski C, Mizubuti ESG (2014) First report of bacterial wilt caused by on sp. in Paraguay. New Disease Reports 29:2.

Paz-Carrasco LC, Castillo-Urquiza GP, Lima ATM, Xavier CAD, Vivas-Vivas LM, Mizubuti ESG, Zerbini FM (2014) Begomovirus diversity in tomato crops and weeds in Ecuador and the detection of a recombinant isolate of *Rhynchosia golden mosaic yucatan virus* infecting tomato. Archives of Virology 159:2127-2132.

Gomes LIS, Bibiano LBJ, Silva GF, Hanada RE, Mizubuti ESG (2014) Baseline sensitivity of brazilian *Mycosphaerella fijiensis* isolates to protectant and systemic fungicides. Tropical Plant Pathology 39:172-177.

Haddad F, Saraiva RM, Mizubuti ESG, Romeiro RS, Maffia LA (2014) Isolation and selection of *Hemileia Vastatrix* antagonists. European Journal of Plant Pathology 139: 763-772.

Pinho DB, Honorato Junior J, Firmino AL, Hora Junior BT, Mizubuti ESG, Pereira OL (2014) Reappraisal of the black mildews (Meliolales) on *Hevea brasiliensis*. Tropical Plant Pathology 39:89-94.

Correia KC, Mizubuti ESG, Silva EKC, Câmara MPS, Sales Junior R, Armengol J, Jimenez JG, Michereff SJ (2014) Fitness components of *Monosporascus cannonballus* isolates from northeastern Brazilian melon fields. Tropical Plant Pathology 39:217-223.

Santana MF, Silva JCF, Mizubuti ESG, Araújo EF, Condon BJ, Turgeon B, Queiroz MV (2014) Characterization and potential evolutionary impact of transposable elements in the genome of *Cochliobolus heterostrophus*. BMC Genomics 15:536.

Gomes LIS, Douhan GW, Bibiano LBJ, Maffia LA, Mizubuti ESG (2013) *Mycosphaerella musicola* Identified as the only pathogen of the Sigatoka Disease Complex present in Minas Gerais State, Brazil. Plant Disease 97:1537-1543.

Queiroz CB, Santana MF, Silva GF, Mizubuti ESG, Araújo EF, Queiroz MV (2013) Use of the IRAP marker to study genetic variability in *Pseudocercospora fijiensis* populations. Current Microbiology 68:358-364.

Duarte HSS, Zambolim L, Capucho AS, Nogueira Junior AF, Rosado AWC, Cardoso CR, Paul PA, Mizubuti ESG (2013) Development and validation of a set of standard area diagrams to estimate severity of potato early blight. European Journal of Plant Pathology 137:249-257.

Haddad F, Saraiva RM, Mizubuti ESG, Romeiro RS, Maffia LA (2013) Antifungal compounds as a mechanism to control *Hemileia vastatrix* by antagonistic bacteria. Tropical Plant Pathology 38:398-405.

Graça RN, Ross-Davis AL, Klopfenstein NB, Kim M-S, Peever TL, Cannon PG, Aun CP, Mizubuti ESG, Alfenas AC (2013) Rust disease of eucalypts, caused by *Puccinia psidii* , did not originate via host jump from guava in Brazil. Molecular Ecology 22:6033-6047.

Augustin JO, Groenewald JZ, Nascimento RJ, Mizubuti ESG, Barreto RW, Elliot SL, Evans HC (2013) Yet more -weeds- in the garden: fungal novelties from nests of leaf-cutting ants. Plos One 8:e82265.

Maia TA, Maciel-Zambolim E, Caixeta ET, Mizubut ESG, Zambolim L (2013) The population structure of *Hemileia vastatrix* in Brazil inferred from AFLP. Australasian Plant Pathology 42:533-542.

Rocha CS, Castillo-Urquiza GP, Lima ATM, Silva FN, Xavier CAD, Hora Júnior BT, Beserra Junior JEA, Malta AWO, Martin DP, Varsani A, Alfenas-Zerbini P, Mizubuti ESG, Zerbini FM (2013) Brazilian Begomovirus populations Aare highly recombinant, rapidly evolving, and segregated based on geographical location. Journal of Virology 87:5784-5799.

Duarte HSS, Zambolim L, Mizubuti ESG, Pádua JG, Júnior JI, Ribeiro L, Carmo E, Nogueira Junior AF (2012) The field resistance of potato cultivars to foliar late blight and its relationship with foliage maturity type and skin type in Brazil. Australasian Plant Pathology 41:139-155.

Silva SJC, Castillo-Urquiza GP, Hora Junior BT, Assunção IP, Lima GSA, Pio-Ribeiro G, Mizubuti ESG, Zerbini FM (2012) Species diversity, phylogeny and genetic variability of begomovirus populations infecting leguminous weeds in northeastern Brazil. Plant Pathology 61:257-267.

Abadio AKR, Lima SS, Santana MF, Salomão TMF, Sartorato A, Mizubuti ESG, Araújo EF, Queiroz MV (2012) Genetic diversity analysis of isolates of the fungal bean pathogen *Pseudocercospora griseola* from central and southern Brazil. Genetics and Molecular Research 11:1272-1279.

Mizobutsi EH, Ferraz S, Mizubuti ESG, Dias-Arieira CR, Ribeiro RCF (2012) Viabilidade e sobrevivência do inóculo de *Heterodera glycines* raça 3 no solo. Tropical Plant Pathology 37:223-226.

Souza AGC, Maffia LA, Mizubuti ESG (2012) Cultural and aggressiveness variability of *Cercospora coffeicola*. Journal of Phytopathology 160:540-546.

Macedo PEF, Maffia LA, Maffia LA, Cota LV, Lourenço W, Mizubuti ESG (2012) Sensitivity of four isolates of *Clonostachys rosea* to pesticides used in the strawberry crop in Brazil. Journal of Pesticide Science 37:333-337.

Elsayed AY, Mizubuti ESG, Silva DJH, Pedrosa CE (2012) The inheritance of late blight resistance derived from *Solanum habrochaites*. Crop Breeding and Applied Biotechnology 12:199-205.

Santana MF, Araújo EF, Souza JT, Mizubuti ESG, Queiroz MV (2012) Development of molecular markers based on retrotransposons for the analysis of genetic variability in *Moniliophthora perniciosa*. European Journal of Plant Pathology 134:497-507.

Souza AGC, Rodrigues FA, Maffia LA, Mizubuti ESG (2011) Infection Process of *Cercospora coffeicola* on Coffee Leaf. Journal of Phytopathology 159:6-11.

Lourenço Junior V, Rodrigues TTMS, Campos AMD, Bragança CAD, Scheuermann KK, Reis A, Brommonschenkel SH, Maffia LA, Mizubuti ESG (2011) Genetic structure of the population of *Alternaria solani* in Brazil. Journal of Phytopathology 159:233-240.

Alvarado ICM, Michereff SJ, Souza EB, Quezado-Duval AM, Resende LV, Cardoso E, Mizubuti ESG (2011) Characterization and variability of soft rot-causing bacteria in Chinese cabbage in north eastern Brazil. Journal of Plant Pathology 93:173-181.

Ferreira MA, Harrington TC, Alfenas AC, Mizubuti ESG (2011) Movement of Genotypes of *Ceratocystis fimbriata* within and among *Eucalyptus* plantations in Brazil. Phytopathology 101:1005-1012.

Grigolli JFJ, Kubota MM, Alves DP, Rodrigues GB, Cardoso CR, Silva DJH, Mizubuti ESG (2011) Characterization of tomato accessions for resistance to early blight. Crop Breeding and Applied Biotechnology 11:174-180.

Elsayed AY, Silva DJH, Mizubuti ESG, Carneiro PC (2011) Combing the monogenic and polygenic resistant genes to late blight in tomato. Journal of Plant Breeding and Crop Science 3:251-259.

Silva SJC, Castillo-Urquiza GP, Hora Junior BT, Assunção IP, Lima GSA, Pio-Ribeiro G, Mizubuti ESG, Zerbini FM (2011) High genetic variability and recombination in a begomovirus population infecting the ubiquitous weed *Cleome affinis* in northeastern Brazil. Archives of Virology 156:2205-2213.

Oliveira Costa VS, Michereff SJ, Martins RB, Gava CAT, Mizubuti ESG, Câmara MPS (2010) Species of Botryosphaeriaceae associated on mango in Brazil. European Journal of Plant Pathology 127: 509-519.

Alves MRR, Torres MCL, Soares NFF, Melo NR, Geraldine RM, Mizubuti ESG, Silveira MFA (2010) Efeito de soluções de enxágue na remoção de resíduos de mancozeb em tomates de mesa. Pesquisa Agropecuária Tropical 40:1-6.

Rodrigues TTMS, Berbee ML. Simmons EG, Cardoso CR, Reis A, Maffia LA, Mizubuti ESG (2010) First report of *Alternaria tomatophila* and *A. grandis* causing early blight on tomato and potato in Brazil. New Disease Reports 22:28.

Rodrigues TTMS, Maffia LA, Dhingra OD, Mizubuti ESG (2010) *In vitro* production of conidia of *Alternaria solani*. Tropical Plant Pathology 35:203-212.

Fiorini CVA, Silva DJH, Mizubuti ESG, Barros JS, Silva LJ, Milagres C, Zaparoli MR (2010) Caracterização de linhagens de tomateiro originadas de cruzamento interespecífico quanto à resistência à requeima. Horticultura Brasileira 28:197-202.

Marchi CE, Brommonschenkel SH, Queiroz MV, Borges MF, Mizubuti ESG (2010) Padrão de integração de pAN7-1 em mutantes de *Magnaporthe grisea* com patogenicidade alterada em arroz. Summa Phytopathologica 36:21-24.

Nascimento RJ, Mizubuti ESG, Câmara MPS, Ferreira MF, Maymon M, Freeman S, Michereff SJ (2010) First report of papaya fruit rot caused by *Colletotrichum magna* in Brazil. Plant Disease 92:1506-1506.

Fiorini CVA, Silva DJH, Silva FF, Mizubuti ESG, Alves DP, Cardoso TS (2010) Agrupamento de curvas de progresso de requeima, em tomateiro originado de cruzamento interespecífico. Pesquisa Agropecuária Brasileira 45:1095-1101.

Curriculum Vitae

José Rogério de Oliveira

Viçosa Federal University
Department of Plant Pathology
Laboratory of Bacteriology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 1098
Tel. (Lab): +51 3 899 1102
Fax: +55 31 3 899 2240
Email: jrogerio@ufv.br

Education and Training

B.A., Agronomy, Viçosa Federal University, 1984

M.Sc. Plant Pathology, Viçosa Federal University, 1988

Ph.D., Plant Pathology, Viçosa Federal University, 1995

Post Ph.D., University of Florida, Gainesville, U.S.A., 2002

Publications in Refereed Journals (from 2010 to 2014)

Andrade CCL, Andrade CCL, Resende RS, Rodrigues FA, Ferraz HGM, Moreira WR, Oliveira JR, Mariano RLR (2013) Silicon reduces bacterial speck development on tomato leaves. Tropical Plant Pathology 38:436-442.

Lima HE, Nechet KL, Halfeld-Vieira BA, Oliveira JR, Duarte HSS, Queiroz ES, Oliveira FL (2013) Elaboração e validação de escalas diagramáticas para avaliação da severidade da mancha-bacteriana do feijão - caupi em cultivares com trifólios morfologicamente distintos. Ciência Rural 43:1735-1743.

Andrade CCL, Resende RS, Rodrigues FA, Silveira PR, Rios JÁ, Oliveira JR, Mariano RLR (2013) Indutores de resistência no controle da pinta bacteriana do tomateiro e na atividade de enzimas de defesa. Tropical Plant Pathology 38:28-34.

Moreira SI, Dutra DC, Rodrigues AC, Oliveira JR, Dhingra OD, Pereira OL (2013) Fungi and bacteria associated with post-harvest rot of ginger rhizomes in Espírito Santo, Brazil. Tropical Plant Pathology 38:218-226.

Furtado GQ, Guimarães LMS, Lisboa DO, Cavalcante GP, Arriel DAA, Alfenas AC, Oliveira JR (2012) First Report of *Enterobacter cowanii* causing bacterial spot on *Mabea fistulifera*, a native forest species in Brazil. Plant Disease 96:1576-1576.

Miguel-Wruck DS, Oliveira JR, Dias LAS (2010) Especificidade de hospedeiro nas interações *Xanthomonas campestris* pv. *campestris* - brássicas. Summa Phytopathologica 36:129-133.

Book and Book Chapters (from 2010 to 2014)

Silva IT, Rodrigues FA, Oliveira JR (2010) Silicon on the management of bacterial disease. In: Rodrigues FA (Ed.). Silício na Agricultura: anais do V Simpósio Brasileiro sobre Silício na Agricultura. Vol. 1. Editora UFV, Viçosa, MG, BRA. pp. 269-278.

Curriculum Vitae

Emerson Medeiros del Ponte

Viçosa Federal University
Department of Plant Pathology
Laboratory of Applied Epidemiology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 1103
Tel. (Lab): +51 3 899 1097
Fax: +55 31 3 899 2240
Email: delponte@ufv.br

Education and Training

B.A., Agronomy, Pelotas Federal University, 1996

M.Sc., Agronomy, Pelotas Federal University, 1999

D.Sc., Plant Pathology, Pelotas Federal University, 2004

Post Ph.D, Plant Pathology, Iowa State University, Ames, U.S.A, 2006

Publications in Refereed Journals (from 2010 to 2014)

Spolti P, Del Ponte EM, Dong Y, Cummings JA, Bergstrom GC (2014) Assessment of triazole sensitivity in a contemporary population of *Fusarium graminearum* from New York wheat and competitiveness of a tebuconazole-resistant isolate. Plant Disease 98:607-613.

Spolti P, Del Ponte EM, Cummings J, Dong Y, Bergstrom GC (2014) Fitness attributes of *Fusarium graminearum* isolates from wheat in New York possessing a 3-ADON or 15-ADON trichothecene genotype. Phytopathology 104:513-519.

Gonzales-Dominguez E, Martins RB, Del Ponte EM, Michereff SJ, Garcia-Jimenez J, Armengol J (2014) Development and validation of a standard area diagram set to aid assessment of severity of loquat scab on fruit. European Journal of Plant Pathology 139:413-422.

Pagnussatt FA, Del Ponte EM, Garda-Buffon J, Badiale-Furlong E (2014) Inhibition of *Fusarium graminearum* growth and mycotoxin production by phenolic extract from *Spirulina* sp.. Pesticide Biochemistry and Physiology 108:21-26.

Alves G, Spolti P, Nesi CN, Del Ponte EM, May de Mio LL (2014) Susceptibility levels and grouping of peach cultivars in relation to peach rust under field conditions. Acta Scientiarum. Agronomy 36:167-174.

Jahnke SM, Del Ponte EM, Redaelli LR, Rego DGP (2014) Spatial patterns and associations of *Anastrepha fraterculus* (Diptera: Tephritidae) and its parasitoid *Doryctobracon areolatus* (Hymenoptera: Braconidae) in organic orchards of *Psidium guajava* and *Acca sellowiana*. The Florida Entomologist 97:744-752.

Stumpf R, dos Santos J, Gomes LB, Silva CN, Tessmann DJ, Ferreira FD, Machinski Junior M, Del Ponte EM (2013) *Fusarium* species and fumonisins associated with maize kernels produced in Rio Grande do Sul State for the 2008/09 and 2009/10 growing seasons. Brazilian Journal of Microbiology 44:89-95.

Chevarria VV, Del Ponte EM, Jahnke SM (2013) Número de gerações de um percevejo e seu parasitoide e da severidade da ferrugem asiática em soja, simulados em cenários de clima e manejo no norte do RS. Ciência Rural 43:571-578.

Spolti P, Guerra DS, Badiale-Furlong Eliana, Del Ponte EM (2013) Single and sequential applications of metconazole alone or in mixture with pyraclostrobin to improve *Fusarium* head blight control and wheat yield in Brazil. Tropical Plant Pathology 38:85-96.

Kuhnem PR, Stumpf R, Spolti P, Del Ponte EM (2013) Características patogênicas de isolados do complexo *Fusarium graminearum* e de *Fusarium verticillioides* em sementes e plântulas de milho. Ciência Rural 43:583.

Spolti P, Del Ponte EM (2013) Agressividade diferencial de espécies do complexo *Fusarium graminearum* em interação com o fungicida tebuconazole na redução do rendimento de trigo. Ciência Rural 43:1569-1575.

Pagnussatt FA, Kupski L, Darley FT, Filoda PF, Del Ponte EM, Garda-Buffon J, Badiale-Furlong E (2013) *Fusarium graminearum* growth inhibition mechanism using phenolic compounds from *Spirulina* sp.. Ciência e Tecnologia de Alimentos 33:75-80.

Guerra DS, Nickel O, Del Ponte EM, Sanhueza RMV, Fajardo TVM, Marodin GAB (2012) Development of *Glomerella* leaf spot (*Colletotrichum gloeosporioides*) is enhanced in virus-infected Maxi Gala apples. Journal of Plant Pathology 94:237-241.

Del Ponte EM, Garda-Buffon J, Badiale-Furlong E (2012) Deoxynivalenol and nivalenol in commercial wheat grain related to *Fusarium* head blight epidemics in southern Brazil. Food Chemistry 132:1087-1091.

Wiebke-Strohm B, Pasquali G, Margis-Pinheiro M, Bencke M, Bücker-Neto L, Becker-Ritt AB, Martinelli AHS, Rechenmacher C, Polacco JC, Stolf R, Marcelino FC, Abdelnoor RV, Homrich MS, Del Ponte EM. Carlini CR, Carvalho MCCG, Bodanese-Zanettini MH (2012) Ubiquitous urease affects soybean susceptibility to fungi. Plant Molecular Biology 79:75-87.

Astolfi P, Reynoso MM, Ramirez L, Chulze SN, Alves TCA, Tessmann DJ, Del Ponte EM (2012) Genetic population structure and trichothecene genotypes of *Fusarium graminearum* isolated from wheat in southern Brazil. Plant Pathology 61:289-295.

Spolti P, Valdebenito-Sanhueza RM, Laranjeira FF, Del Ponte EM (2012) Comparative spatial analysis of the sooty blotch and flyspeck disease complex, bull's eye and bitter rots of apples. Plant Pathology 61:271-280.

De Paula VA, Bergamaschi H, Del Ponte EM, Cardoso LS, Bosco LC (2012) Duração do período de molhamento foliar em pomares de macieira em céu aberto e sob tela antigranizo, em Vacaria, RS. Revista Brasileira de Fruticultura 34:504-514.

Spolti P, Barros NC, Gomes LB, dos Santos J, Del Ponte EM (2012) Phenotypic and pathogenic traits of two species of the *Fusarium graminearum* complex possessing either 15-ADON or NIV genotype. European Journal of Plant Pathology 133:621-629.

Spolti P, De Jorge BC, Del Ponte EM (2012) Sensitivity of *Fusarium graminearum* causing head blight of wheat in Brazil to tebuconazole and metconazole fungicides. Tropical Plant Pathology 37:419-423.

Spolti P, Schneider L, Sanhueza RMV, Batzer J, Gleason ML, Del Ponte EM (2011) Improving sooty blotch and flyspeck severity estimation on apple fruit with the aid of a diagrammatic scale. European Journal of Plant Pathology 129:21-29.

Del Ponte EM, Maia AHN, Santos TV, Martins EJ, Baethgen W(2011) Early-season warning of regional soybean rust epidemics using El Niño/Southern Oscilation information. International Journal of Biometeorology 55:575-583.

Gleason ML, Batzer JC, Sun G, Zhang R, Arias MMD, Sutton TB, Crous PW, Ivanović M, McManus PS, Cooley DR, Mayr U, Weber RWS, Yoder KS, Del Ponte EM, Biggs AR, Oertel B (2011) A new view of sooty blotch and flyspeck. Plant Disease 95:368-383.
Citações:17|20

Farias CRJ, Afonso APS, Pierobom CR, Del Ponte EM (2011) Regional survey and identification of *Bipolaris* spp. associated with rice seeds in Rio Grande do Sul State, Brazil. Ciência Rural 41:369-372.

Spolti P, Sanhueza RMV, Gleason ML, Del Ponte EM (2011) Inoculum and infection dynamics of the sooty blotch and flyspeck complex of apples in southern Brazil. Journal of Plant Pathology 93:497-501.

Astolfi P, dos Santos J, Schneider L, Gomes LB, Silva CN, Tessmann DJ, Del Ponte EM (2011) Molecular survey of trichothecene genotypes of *Fusarium* graminearum species complex from barley in Southern Brazil. International Journal of Food Microbiology 148:197-201.

Spolti P, Sanhueza RMV, Gleason ML, Del Ponte EM (2011) Sooty blotch and flyspeck control with fungicide applications based on calendar, local IPM, and warning system. Pesquisa Agropecuária Brasileira 46:697-705.

Spolti P, Sanhueza RMV, Del Ponte EM (2010) Meio semi-seletivo para recuperação e quantificação de *Cryptosporiopsis perennans* em maçãs. Ciência Rural 40:661-665.

Farias CRJ, Del Ponte EM, Corrêa CL, Afonso AP, Pierobom CR (2010) Infecção de sementes de trigo com *Bipolaris sorokiniana* pela técnica de restrição hídrica. Tropical Plant Pathology 35:253-257.

Valdebenito-Sanhueza RM, Spolti P, Del Ponte EM (2010) Controle do inóculo inicial para redução dos danos pela podridão: 'olho-de-boi' em macieiras. Revista Brasileira de Fruticultura 32:1044-1054.

Astolfi P, Santos J, Spolti P, Tessmann DJ, Del Ponte EM (2010) Complexo *Fusarium graminearum*: taxonomia, perfil toxigênico e genética populacional na era molecular. Revisão Anual de Patologia de Plantas 18:119-161.

Book and Book Chapters (from 2010 to 2014)

Del Ponte EM, Tessmann DJ, Spolti P, Kuhnem PR, Silva CN (2013) Species identification, genetic diversity and phenotypic variation studies on the *Fusarium graminearum* complex populations from Brazil. In: Alconada Magliano TM, Chulze SN (Eds.). *Fusarium* Head Blight in Latin America. Vol. 1. Springer: Netherlands. pp. 15-29.

Del Ponte EM, Dalla Lana F (2012) Avaliação de risco de doenças de plantas: conceitos e aplicações para decisões táticas e estratégicas no manejo. In: Núcleo de Estudos em Fitopatologia. (Ed.). Avanços na otimização do uso de defensivos agrícolas no manejo fitossanitário. Vol. 1. Suprema Gráfica e Editora, São Carlos, SP, BRA. pp. 237-257.

Godoy CV, Del Ponte EM (2011) Roya de la soja (*Phakopsora pachyrhizi*, *P. meibomiae*). In: Margarita S, Roberto M (Eds.). Las enfermedades de la soja y su importancia en los países del Mercosur. Vol. 1. Hemisferio Sur, Buenos Aires, ARG. pp. 104-112.

Sanhueza RMV, Bogo A, Cantillano RFF, Stadnik M, Bartnicki VA, Becker WF, Castro LAS, Katsurayama Y, Del Ponte EM, Spolti P (2011) Caracterização e controle das doenças de verão. In: Gilmar RN (Ed.). Inovações tecnológicas para o setor da maçã - Inovamaçã: relatório técnico. Vol. 1. Embrapa Uva e Vinho, Bento Gonçalves, RS, BRA. pp. 23-106.

Curriculum Vitae

Fabrício de Ávila Rodrigues

Viçosa Federal University
Department of Plant Pathology
Laboratory of Host-Parasite Interaction
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 1113
Tel. (Lab): +51 3 899 1112
Fax: +55 31 3 899 2240
Email: fabricio@ufv.br

Education and Training

B.A., Agronomy, Uberlândia Federal University, 1996

M.Sc. Plant Pathology, Viçosa Federal University, 2000

Ph.D., Plant Pathology, University of Florida, Gainesville, U.S.A., 2004

Publications in Refereed Journals (from 2010 to 2014)

Polanco LR, Rodrigues FA, Moreira EN, Duarte HSS, Cacique IS, Valente LA, Vieira RF, Paula Júnior TJ, Vale FXR (2014) Management of anthracnose in common bean by foliar sprays of potassium silicate, sodium molybdate, and fungicide. Plant Disease 98:84-89.

Lopes UP, Zambolim L, Souza Neto PN, Duarte HSS, Ribeiro JI, Souza AF, Rodrigues FA (2014) Silicon and Triadimenol for the Management of Coffee Leaf Rust. Journal of Phytopathology 162:124-128.

Cruz MFA, Rodrigues FA, Diniz APC, Moreira MA, Barros EG (2014) Soybean Resistance to *Phakopsora pachyrhizi* as affected by acibenzolar-S-methyl, jasmonic acid and silicon. Journal of Phytopathology 162:132-136.

Perez CEA, Rodrigues FA, Moreira WR, DaMatta FM (2014) Leaf Gas Exchange and chlorophyll *a* fluorescence in wheat plants supplied with silicon and infected with *Pyricularia oryzae*. Phytopathology 104:143-149.

Debona D, Rodrigues FA, Rios JA, Martins SCV, Pereira LF, DaMatta FM (2014) Limitations to photosynthesis in leaves of wheat plants infected by *Pyricularia oryzae*. Phytopathology 104:33-39.

Polanco LR, Rodrigues FA, Nascimento KJT, Cruz MFA, Curvelo CRS, DaMatta FM, Vale FXR (2014) Photosynthetic gas exchange and antioxidative system in common bean plants infected by *Colletotrichum lindemuthianum* and supplied with silicon. Tropical Plant Pathology 39:35-42.

Dallagnol LJ, Rodrigues FA, Mielli MVB, Ma JF (2014) Rice grain resistance to brown spot and yield are increased by silicon. Tropical Plant Pathology 39:56-63.

Carré-Missio V, Rodrigues FA, Schurt DA, Resende RS, Souza NFA, Rezende DC, Moreira WR, Zambolim L (2014) Effect of foliar-applied potassium silicate on coffee leaf infection by. Annals of Applied Biology 164:396-403.

Debona D, Rodrigues FA, Rios JA, Nascimento KJT, Silva LC (2014) The effect of silicon on antioxidant metabolism of wheat leaves infected by *Pyricularia oryzae*. Plant Pathology 63:581-589.

Rios JA, Rodrigues FA, Debona D, Silva LC (2014) Photosynthetic gas exchange in leaves of wheat plants supplied with silicon and infected with *Pyricularia oryzae*. Acta Physiologiae Plantarum 36:371-379.

Guerra AMNM, Rodrigues FA, Lima TC, Berger PG, Barros AF, Silva YCR (2014) Capacidade fotossintética de plantas de algodoeiro infectadas por ramulose e supridas com silício. Bragantia 73:50-64.

Fortunato AA, Da Silva WL, Rodrigues FA (2014) Phenylpropanoid Pathway Is Potentiated by Silicon in the Roots of Banana Plants During the Infection Process of *Fusarium oxysporum* f. sp. *cubense*. Phytopathology 104:596-603.

Rios JA, Rodrigues FA, Debona D, Resende RS, Moreira WR, Andrade CCL (2014) Induction of resistance to *Pyricularia oryzae* in wheat by acibenzolar-S-methyl, ethylene and jasmonic acid. Tropical Plant Pathology 39:224-233.

Domiciano GP, Duarte HSS, Moreira EM, Rodrigues FA (2014) Development and validation of a set of standard area diagrams to aid in estimation of spot blotch severity on wheat leaves. Plant Pathology 63:922-928.

Araujo L, Bispo W, Cacique I, Moreira W, Rodrigues FA (2014) Resistance in mango against infection by *Ceratocystis fimbriata*. Phytopathology 104:820-833.

Resende RS, Rodrigues FA, Costa RV, Silva DD (2013) Silicon and fungicide effects on anthracnose in moderately resistant and susceptible sorghum lines. Journal of Phytopathology 161:11-17.

Dallagnol LJ, Rodrigues FA, Chaves ARM, Vale FXR, DaMatta FM (2013) Photosynthesis and sugar concentration are impaired by the defective active silicon uptake in rice plants infected with *Bipolaris oryzae*. Plant Pathology 62:120-129.

Andrade CCL, Resende RS, Rodrigues FA, Silveira PR, Rios JA, Oliveira JR, Mariano RLR (2013) Indutores de resistência no controle da pinta bacteriana do tomateiro e na atividade de enzimas de defesa. Tropical Plant Pathology 38:28-34.

Silva RV, Oliveira RDL, Ferreira OS, Ferreira AO, Rodrigues FA (2013) Defense responses to *Meloidogyne exigua* in resistant coffee cultivar and non-host plant. Tropical Plant Pathology 38:114-121.

Schurt DA, Rodrigues FA, Souza NFA, Reis RD (2013) Efeito de diferentes moléculas na redução dos sintomas da queima das bainhas em arroz e no crescimento de *Rhizoctonia solani* in vitro. Revista Ceres 60:221-225.

Resende RS, Rodrigues FA, Gomes RJ, Nascimento KJT (2013) Microscopic and biochemical aspects of sorghum resistance to anthracnose mediated by silicon. Annals of Applied Biology 63:114-123.

Rios JA, Debona D, Duarte HSS, Rodrigues FA (2013) Development and validation of a standard area diagram set to assess blast severity on wheat leaves. European Journal of Plant Pathology 136:603-611.

Curvelo CRS, Rodrigues FA, Silva LC, Nascimento KJT, Berger PG (2013) Mecanismos bioquímicos da defesa do algodoeiro à mancha de ramulária mediados pelo silício. Bragantia 72:41-51.

Schurt DA, Rodrigues FA, Missio VC, Soares NFF (2013). Silício alterando compostos derivados da pirólise de bainhas foliares de plantas de arroz infectadas por *Rhizoctonia solani*. Bragantia 72:52-60.

Domiciano GP, Rodrigues FA, Guerra AMN, Vale FXR (2013) Infection process of *Bipolaris sorokiniana* on wheat leaves is affected by silicon. Tropical Plant Pathology 38:258-263.

Moreira WR, Resende RS, Rodrigues FA, Andrade CCL, Nascimento CWA (2013) Influência do magnésio na resistência do arroz à mancha parda. Bragantia 72:154-161.

Cruz MFA, Rodrigues FA, Rodriguez LP, Curvelo CRS, Nascimento KJT, Moreira MA, Barros EG (2013) Inducers of resistance and silicon on the activity of defense enzymes in the soybean-*Phakopsora pachyrhizi* interaction. Bragantia 72:162-172.

Pereira AC, Cruz MFA, Paula Júnior TJ, Rodrigues FA, Carneiro JES, Vieira RF, Carneiro PCS (2013) Infection process of *Fusarium oxysporum* f. sp. *phaseoli* on resistant, intermediate and susceptible bean cultivars. Tropical Plant Pathology 38:323-328.

Dhingra OD, Schurt DA, Oliveira RDL, Rodrigues FA (2013) Potential of soil fumigation with mustard essential oil to substitute biofumigation by cruciferous plant species. Tropical Plant Pathology 38:337-342.

Moreira WR, Rodrigues FA, Duarte HSS (2013) Effect of zinc on the development of brown spot in rice. Journal of Phytopathology 161:749-751.

Guerra AMNM, Rodrigues FA, Berger PG, Barro AF, Rodrigues YC, Lima TC (2013) Resistência do algodoeiro à ferrugem tropical potencializada pelo silício. Bragantia 72:279-291.

Guerra AMNM, Rodrigues FA, Berger PG, Barros AF, Rodrigues YC, Lima TC (2013) Aspectos bioquímicos da resistência do algodoeiro à ramulose potencializada pelo silício. Bragantia 72:292-303.

Cacique IS, Domiciano GP, Moreira WR, Rodrigues FA, Cruz MFA, Serra NS, Catala AB (2013) Effect of root and leaf applications of soluble silicon on blast development in rice. Bragantia 72:304-309.

Andrade CCL, Resende RS, Rodrigues FA, Ferraz HGM, Moreira WR, Oliveira JR, Mariano RLR (2013) Silicon reduces bacterial speck development on tomato leaves. Tropical Plant Pathology 38:436-442.

Wordell Filho JA, Duarte HSS, Rodrigues FA, Efeito da aplicação foliar de silicato de potássio e de fungicida na severidade da ferrugem da folha e da mancha amarela do trigo. Revista Ceres 60:726-730.

Sousa RS, Rodrigues FA, Schurt DA, Souza NFA, Cruz MFA (2013) Cytological aspects of the infection process of *Pyricularia oryzae* on leaves of wheat plants supplied with silicon. Tropical Plant Pathology 38:472-477.

Dallagnol LJ, Rodrigues FA, Mielli MVB (2013) Silicon improves the emergence and sanity of rice seedlings obtained from seeds infected with *Bipolaris oryzae*. Tropical Plant Pathology 38:478-484.

Lopes UP, Zambolim L, Souza Neto PN, Souza AF, Capucho AS, Rodrigues FA (2013) Effect of foliar application of potassium silicate on the progress of coffee leaf rust. Tropical Plant Pathology 38:547-551.

Curvelo CRS, Rodrigues FA, Pereira LF, Silva LC, DaMatta FM, Berger PG (2013) Trocas gasosas e estresse oxidativo em plantas de algodoeiro supridas com silício e infectadas por *Ramularia areola*. Bragantia 72:346-359.

Schurt DA, Rodrigues FA, Colodette JL, Missio VC (2013) Efeito do silício nas concentrações de lignina e de açúcares em bainhas de folhas de arroz infectadas por *Rhizoctonia solani*. Bragantia 72:360-366.

Cruz MFA, Rodrigues FA, Diniz APC, Moreira MA, Barros EG (2013) Potassium silicate and calcium silicate on the resistance of soybean to *Phakopsora pachyrhizi* infection. Bragantia 72:373-377.

Silva IT, Rodrigues FA, Baroni JCP (2012) Effect of Soil-applied Zinc and Manganese on the Development of *Rhizoctonia* aerial blight of soybean. Journal of Phytopathology 160:135-138.

Dallagnol LJ, Rodrigues FA, Tanaka FAO, Amorim L, Camargo LEA (2012) Effect of potassium silicate on epidemic components of powdery mildew on melon. Plant Pathology 61:323-330.

Cruz MFA, Silva FS, Rodrigues FA, Araujo JM, Barros EG (2012) Silício no processo infeccioso de *Phakopsora pachyrhizi* em folíolos de plantas de soja. Pesquisa Agropecuária Brasileira 47:142-145.

Carré-Missio V, Rodrigues FA, Schurt DA, Rezende DC, Moreira WR, Korndorfer GH, Zambolim L (2012) Componentes epidemiológicos da ferrugem do cafeeiro afetados pela aplicação foliar de silicato de potássio. Tropical Plant Pathology 37:50-56.

Schurt DA, Rodrigues FA, Dutra RR, Moreira WR, Souza NFA, Silva WA (2012) Resistência física de bainhas de plantas de arroz supridas com silício e infectadas por *Rhizoctonia solani*. Tropical Plant Pathology 37:281-285.

Carré-Missio V, Rodrigues FA, Schurt DA, Moreira WR, Rezende DC, Korndörfer GH, Zambolim L (2012) Proteção local, não sistêmica, do silicato de potássio reduz os sintomas da ferrugem do cafeeiro. Tropical Plant Pathology 37:275-280.

Rodriguez LP, Rodrigues FA, Nascimento KJT, Schulman P, Silva LC, Neves FW, Vale FXR (2012) Biochemical aspects of bean resistance to anthracnose mediated by silicon. Annals of Applied Biology 161:140-150.

Resende RS, Rodrigues FA, Cavatte PC, Martins SCV, Moreira WR, Chaves GRM, DaMatta FM (2012) Leaf gas exchange and oxidative stress in sorghum plants supplied with silicon and infected by *Colletotrichum sublineolum*. Phytopathology 102:892-898.

Cacique IS, Domiciano GP, Rodrigues FA, Vale FXR (2012) Silicon and manganese on rice resistance to blast. Bragantia 72:239-244.

Fortunato AA, Rodrigues FA, Nascimento KJT (2012) Physiological and biochemical aspects of the resistance of banana plants to *Fusarium* wilt potentiated by silicon. Phytopathology 102:957-966.

Fortunato AA, Rodrigues FA, Baroni JCP, Soares GCB, Rodriguez MAD, Pereira OL (2012) Silicon suppresses *Fusarium* wilt development in banana plants. Journal of Phytopathology 160:674-679.

Detmann KC, Araújo WL, Martins SCV, Sanglard LMVP, Reis JV, Detmann E, Rodrigues FA, Nunes-Nesi A, Fernie AR, DaMatta FM (2012) Silicon nutrition increases grain yield, which, in turn, exerts a feed-forward stimulation of photosynthetic rates via enhanced mesophyll conductance and alters primary metabolism in rice. New Phytologist 196:752-762.

Silva MRJ, Pereira SC, Rodrigues FA, Zanão Júnior LA, Fontes RLF, Oliveira MGA (2012) Silicon and manganese on the activity of enzymes involved in rice resistance against brown spot. Tropical Plant Pathology 37:339-345.

Debona D, Rodrigues FA, Rios JA, Nascimento KJT (2012) Biochemical changes in the leaves of wheat plants infected by *Pyricularia oryzae*. Phytopathology 102:1121-1129.

Prabhu AS, Barbosa Filho MP, Datnoff LE, Snyder GH, Berni RF, Rodrigues FA, Dallagnol LJ (2012) Silicon reduces brown spot severity and grain discoloration on several rice genotypes. Tropical Plant Pathology 37:409-414.

Souza AGC, Rodrigues FA, Maffia LA, Mizubuti ESG (2011) Infection process of *Cercospora coffeicola* on coffee leaf. Journal of Phytopathology 159:6-11.

Filha MSX, Rodrigues FA, Domiciano GP, Oliveira HV, Silveira PR, Moreira WR (2011) Wheat resistance to leaf blast mediated by silicon. Australasian Plant Pathology 40:28-38.

Dallagnol LJ, Rodrigues FA, DaMatta FM, Mielli MVB, Pereira SC (2011) Deficiency in silicon uptake affects cytological, physiological, and biochemical events in the rice interaction. Phytopathology 101:92-104.

Cruz MFA, Souza GA, Rodrigues FA, Sediyama CS, Barros EG (2011) Reação de genótipos de soja à infecção natural por ferrugem asiática. Pesquisa Agropecuária Brasileira 46:215-218.

Dallagnol LJ, Rodrigues FA, DaMatta FM (2011) Brown spot of rice is affected by photon irradiance and temperature. Journal of Phytopathology 159:630-634.

Dallagnol LJ, Rodrigues FA, Martins SCV, Cavatte PC, DaMatta FM (2011) Alterations on rice leaf physiology during infection by *Bipolaris oryzae*. Australasian Plant Pathology 40:360-365.

Rodrigues FA, Carré-Missio V, Jham GN, Berhow M, Schurt DA (2011) Chlorogenic acid levels in leaves of coffee plants supplied with silicon and infected by *Hemileia vastatrix*. Tropical Plant Pathology 36:404-408.

Cruz MFA, Diniz APC, Rodrigues FA, Barros EG (2011) Aplicação foliar de produtos na redução da severidade da brusone do trigo. Tropical Plant Pathology 36:424-428.

Carvalho MP, Rodrigues FA, Silveira PR, Andrade CCL, Baroni JCP, Paye HS, Loureiro Junior JE (2010) Rice resistance to brown spot mediated by nitrogen and potassium. Journal of Phytopathology 158:160-166.

Silva IT, Rodrigues FA, Oliveira JR, Pereira SC, Andrade CCL, Silveira PR, Conceição MM (2010) Wheat resistance to bacterial leaf streak mediated by silicon. Journal of Phytopathology 158:253-262.

Domiciano GP, Rodrigues FA, Vale FXR, Xavier Filha MS, Moreira WR, Andrade CCL, Pereira SC (2010) Wheat resistance to spot blotch potentiated by silicon. Journal of Phytopathology 158:334-343.

Silva RV, Oliveira RDL, Nascimento KJT, Rodrigues FA (2010) Biochemical responses of coffee resistance against *Meloidogyne exigua* mediated by silicon. Plant Pathology 59:586-593.

Curvelo CRS, Rodrigues FA, Berger PG, Rezende DC, Microscopia eletrônica de varredura do processo infeccioso de *Ramularia areola* em folhas de algodoeiro. Tropical Plant Pathology 38:108-113.

French-Monar RD, Rodrigues FA, Korndorfer GH, Datnoff LE (2010) Silicon suppresses *Phytophthora* blight development on bell Pepper. Journal of Phytopathology 158:554-560.

Domiciano GP, Rodrigues FA, Moreira WR, Oliveira HV, Vale FXR, Xavier Filha MS (2010) Silício no progresso da mancha marrom na folha bandeira do trigo. Tropical Plant Pathology 35:186-189.

Carré-Missio V, Rodrigues FA, Schurt DA, Rezende DC, Ribeiro NB, Zambolim L (2010) Aplicação foliar de silicato de potássio, acibenzolar-S-metil e fungicidas na redução da mancha de *Pestalotia* em morango. Tropical Plant Pathology 35:182-185.

Rodrigues FA, Duarte HSS, Rezende DC, Wordell Filho JA, Korndorfer GH, Zambolim L (2010) Foliar spray of potassium silicate on the control of angular leaf spot on beans. Journal of Plant Nutrition 33:2082-2093.

Book and Book Chapters (from 2010 to 2014)

Rodrigues FA, Fortunato AA, Resende RS (2012) Indução de Resistência em Plantas a Patógenos. Vol. 1. Suprema Gráfica e Editora Ltda, Visconde do Rio Branco, MG, BRA. 358p.

Rodrigues FA (2011) Silício na Agricultura - Anais do V Simpósio Brasileiro sobre Silício na Agricultura. Vol. 1. Suprema Gráfica e Editora Ltda, Visconde do Rio Branco, MG, BRA. 385p .

Dhingra OD, Silva Júnior GJ, Rodrigues FA (2013) Patologia de sementes. In: Tuneo S (Ed.). Tecnologias de Produção de Sementes de Soja. Vol. 1. Mecenas Ltda, Londrina, PR, BRA. pp. 135-162.

Rodrigues FA, Fortunato AA, Resende RS (2012) Silício no manejo integrado de doenças de Plantas. In: Podestá GS, Amora DX, Santiago TR, Nasu EGC, Machado PS, Guatimosim E, Fortunato AA (Eds.). Nutrição no Manejo de Doenças de Plantas. Vol. 1.Viçosa, MG, BRA. pp. 213-235.

Rodrigues FA, Resende RS, Fortunato AA (2012) Silício no manejo de doenças em culturas anuais e perenes. In: Silva LC, Moura Filho G, Moura AB, Albuquerque AW (Eds.). Reunião Brasileira de Fertilidade do Solo e Nutrição de Plantas, Fertbio 2012 - A Responsabilidade Socioambiental da Pesquisa Agrícola. Vol. 1. Sociedade Brasileira de Ciência do Solo, Viçosa, MG, BRA. pp. 1-17.

Rodrigues FA, Resende RS, Fortunato AA, Cruz MFA (2012) Silício na Resistência de Plantas à Patógenos. In: EMBRAPA Clima Temperado (Ed.). Workshop Insumos para Agricultura Sustentável. 27 a 29 de novembro de 2012. Embrapa Clima Temperado. Vol. 1. EMBRAPA Clima Temperado, Pelotas, RS, BRA. pp. 1-6.

Rodrigues FA, Resende RS, Dallagnol LJ, Silva IT, Domiciano GP (2011) A review of silicon´s use on the monocots sorghum, rice and wheat. In: Pele L, Powell JJ, Kinrade S, Juddaohsingh R, Collery P, Maymard I, Badawi A (Eds.). Metal in Biology and Medicine and Aqueous Chemistry and Biochemistry of Silicon. Vol. 11. John Libbet: Paris, FRA. pp. 299-304.

Rodrigues FA, Silva IT, Dallagnol LJ, Domiciano GP, Resende RS, Rezende DC, Schurt DA (2010) The Use of silicon to control foliar diseases. In: Prado RM, Cecílio Filho AB, Correia MAR, Puga AP (Eds.) Nutrição de Plantas - Diagnose Foliar em Hortaliças. Vol. 1. Fundunesp, Jaboticabal, SP, BRA. pp. 91-108.

Rodrigues FA, Resende RS, Domiciano GP (2010) O potencial do silício para as fruteiras. In: Rodrigues FA (Ed.). Silício na Agricultura - Anais do V Simpósio Brasileiro sobre Silício na Agricultura. Vol. Suprema Gráfica e Editora Ltda, Visconde do Rio Branco, MG, BRA. pp. 171-181.

Rodrigues FA, Resende RS, Dallagnol LJ (2010) A review of silicon's use on the monocots rice and sorghum. In: Rodrigues FA (Ed.). Silício na Agricultura - Anais do V Simpósio Brasileiro sobre Silício na Agricultura. Vol. 1. Suprema Gráfica e Editora Ltda, Visconde do Rio Branco, MG, BRA. pp. 257-267.

Silva IT, Rodrigues FA, Oliveira JR (2010) Silicon on the management of bacterial diseases. In: Rodrigues FA (Ed.). Silício na Agricultura - Anais do V Simpósio Brasileiro sobre Silício na Agricultura. Vol. 1. Suprema Gráfica e Editora Ltda, Visconde do Rio Branco, MG, BRA. pp. 269-278.

Rodrigues FA, Resende RS (2010) Silício na potencialização da resistência de plantas a patógenos. In: Núcleo de Estudos em Fitopatologia da UFLA e Sociedade Brasileira de Fitopatologia (Ed.). Anais da V Reunião Brasileira sobre Indução de Resistência em Plantas. Vol. 1. Brasília, DF, BRA pp. 171-180.

Curriculum Vitae

Francisco Murilo Zerbini Júnior

Viçosa Federal University
Department of Plant Pathology
Laboratory of Virology
Viçosa, Minas Gerais, Zip Code 36570-900, Brazil

Tel. (Office): +55 31 3 899 2935
Tel. (Lab): +51 3 899 2934
Fax: +55 31 3 899 2240
Email: zerbini@ufv.br

Education and Training

B.A., Agronomy, Viçosa Federal University, 1988

M.Sc. Plant Pathology, Viçosa Federal University, 1991

Ph.D., Plant Pathology, University of California, Davis, U.S.A., 1996

Sabbatical. Molecular Biology Applied to Virology, University of South Carolina, Columbia, U.S.A, 2002

Publications in Refereed Journals (from 2010 to 2014)

Paz-Carrasco L, Castillo-Urquiza GP, Lima ATM, Xavier CAD, Vivas-Vivas L, Mizubuti ESG, Zerbini FM (2014) Begomovirus diversity in tomato crops and weeds in Ecuador and the detection of a recombinant isolate of rhynchosia golden mosaic Yucatan virus infecting tomato. Archives of Virology 159: 2127-2132.

Varsani A, Martin DP, Navas-Castillo J, Moriones E, Hernández-Zepeda C, Idris A, Zerbini FM, Brown JK (2014) Revisiting the classification of curtoviruses based on genome-wide pairwise identity. Archives of Virology 159: 1873-1882.

Varsani A, Navas-Castillo J, Moriones E, Hernández-Zepeda C, Idris A, Brown JK, Zerbini FM, Martin DP (2014) Establishment of three new genera in the family Geminiviridae: Becurtovirus, Eragrovirus and Turncurtovirus. Archives of Virology 159:2193-2203.

Silva FN, Lima ATM, Rocha CS, Castillo-Urquiza GP, Alves Junior M, Zerbini FM (2014) Recombination and pseudorecombination driving the evolution of the begomoviruses *Tomato severe rugose virus* (ToSRV) and *Tomato rugose mosaic virus* (ToRMV): two recombinant DNA-A components sharing the same DNA-B. Virology Journal 11:66.

Al-Shihi AAM, Khan AJ, Akhtar S, Lima ATM, Zerbini FM, Briddon R (2014) Occurrence of new recombinant begomovirus species infecting tomato in the Al Batinah region of Oman. Plant Pathology:n/a-n/a.

Ramos-Sobrinho R, Xavier CAD, Pereira HMB, Lima GSA, Assunção IP, Mizubuti ESG, Duffy S, Zerbini FM (2014) Contrasting genetic structure between two begomoviruses infecting the same leguminous hosts. Journal of General Virology 95:on line-on line.

Lima ATM, Ramos-Sobrinho R, Gonzalez-Aguilera J, Rocha CS, Silva SJC, Xavier CAD, Silva FN, Duffy S, Zerbini FM (2013) Synonymous site variation due to recombination explains higher variability in begomovirus populations infecting non-cultivated hosts. Journal of General Virology 94:418-431, 2013.

Carvalho SL, Silva FN, Zanardo LG, Almeida AMR, Zerbini FM, Carvalho CM (2013) Production of polyclonal antiserum against Cowpea mild mottle virus coat protein and its application in virus detection. Tropical Plant Pathology 38:49-54.

Rocha CS, Castillo-Urquiza GP, Lima ATM, Silva FN, Xavier CAD, Hora Junior BT, Beserra Junior JEA, Malta AWO, Martin DP, Varsani A, Alfenas-Zerbini P, Mizubuti ESG, Zerbini FM (2013) Brazilian begomovirus populations are highly recombinant, rapidly evolving, and segregated based on geographical location. Journal of Virology 87:5784-5799.

Melgarejo T, Kon T, Rojas MR, Paz-Carrasco L, Zerbini FM, Gilbertson RL (2013) Characterization of a New World monopartite begomovirus causing leaf curl disease of tomato in Ecuador and Peru reveals a new direction in geminivirus evolution. Journal of Virology 87:5397-5413.

Quiñones-Pantoja M, Martinez-Zubiaur Y, Arana F, Martinez MA, Zamora L, Miranda I, Zerbini FM (2013) Coexistencia de potyvirus y begomovirus en el cultivo del pimiento (*Capsicum annuum* L.) en Cuba. Revista de Protección Vegetal 28:36-44.

Lima JS, Lima ATM, Castillo-Urquiza GP, Silva SJC, Assunção IP, Michereff SJ, Zerbini FM, Lima GSA (2013) Variabilidade genética de isolados de badnavírus infectando inhame (*Dioscorea* spp.) no nordeste do Brasil. Tropical Plant Pathology 38:349-353.

Gonzalez-Aguilera J, Hurtado FD, Almeida VS, Tavares SS, Ramos-Sobrinho R, Nick C, Soares, MO, Xavier CAD, Freitas RD, Gil MA, Zerbini FM, Silva DJH (2013) Response of tomato (*Solanum* L. section Lycopersicon Mill.) germplasm to begomovirus inoculation under controlled and field conditions. Genetic Resources and Crop Evolution 61:435-450.

Zanardo LG, Silva FN, Lima ATM, Milanesi DF, Castilho-Urquiza GP, Almeida AMR, Zerbini FM, Carvalho CM (2013) Molecular variability of cowpea mild mottle virus infecting soybean in Brazil. Archives of Virology 159:727-737.

Muhire B, Martin DP, Brown JK, Navas-Castillo J, Moriones E, Zerbini FM, Rivera-Bustamante R, Malathi VG, Briddon RW, Varsani A (2013) A genome-wide pairwise-identity-based proposal for the classification of viruses in the genus Mastrevirus (family Geminiviridae). Archives of Virology 158:1411-1424.

Zanardo LG, Silva FN, Bicalho AAC, Urquiza GPC, Lima ATM, Almeida AMR, Zerbini FM, Carvalho CM (2013) Molecular and biological characterization of *Cowpea mild mottle virus* isolates infecting soybean in Brazil and evidence of recombination. Plant Pathology 63:n/a-n/a.

Daltro CB, Pereira AJ, Cascardo RS, Alfenas-Zerbini P, Beserra Junior JEA, Lima JAA, Zerbini FM, Andrade EC (2012) Genetic variability of papaya lethal yellowing virus isolates from Ceará and Rio Grande do Norte states, Brazil. Tropical Plant Pathology 37:37-43.

Tavares SS, Ramos-Sobrinho R, Gonzalez-Aguilera J, Assunção IP, Lima GSA, Zerbini FM (2012) Further molecular characterization of weed-associated begomoviruses in Brazil, with emphasis on *Sida* spp.. Planta Daninha 30:305-315.

Pereira AJ, Alfenas-Zerbini P, Cascardo RS, Andrade EC, Zerbini FM (2012) Analysis of the full-length genome sequence of *Papaya lethal yellowing virus* (PLYV), determined by deep sequencing, confirms its classification in the genus Sobemovirus. Archives of Virology 157:2009-2011.

Silva SJC, Castillo-Urquiza GP, Hora Junior BT, Assunção IP, Lima GSA, Pio-Ribeiro G, Mizubuti ESG, Zerbini FM (2012) Species diversity, phylogeny and genetic variability of begomovirus populations infecting leguminous weeds in northeastern Brazil. Plant Pathology 61:457-467.

González-Aguilera J, Tavares SS, Ramos-Sobrinho R, Xavier CAD, Dueñas-Hurtado F, Lara-Rodrigues RM, Silva DJH, Zerbini FM (2012) Genetic structure of a Brazilian population of the begomovirus *Tomato severe rugose virus* (ToSRV). Tropical Plant Pathology 37:346-353.

Dueñas-Hurtado Francisco, Gil MA, Martinez-Zubiaur Y, González-Aguilera J, Xavier CAD, Zerbini FM, Silva DJH (2012) Fontes de resistência em tomateiro aos begomovírus bissegmentados *Tomato yellow spot virus* e *Tomato severe rugose virus*. Horticultura Brasileira 30:639-644.

Rodriguez-Pardina P, Hanada K, Graciela-Laguna I, Zerbini FM, Ducasse DA (2011) Molecular characterization and relative incidence of bean- and soybean-infecting begomoviruses in northwestern Argentina. Annals of Applied Biology 158:69-78.

Barros DR, Alfenas-Zerbini P, Beserra Junior JEA, Antunes TFS, Zerbini FM (2011) Comparative analysis of two isolates of *Cowpea aphid-borne mosaic virus* (CABMV) obtained from different hosts. Archives of Virology 156:1085-1091.

Beserra Junior JEA, Carvalho MG, Barguil BM, Zerbini FM (2011) Partial genome sequence of a Potyvirus and of a virus in the order Tymovirales found in *Senna macranthera* in Brazil. Tropical Plant Pathology 36:116-120.

Aguilera GAH, Dueñas-Hurtado F, Xavier CAD, Laurindo BS, Nick C, Gil MA, Silva DJH, Zerbini FM (2011) Identificação dos genes Ty-2 e Ty-3 de resistência a begomovírus em genótipos de tomateiro. Pesquisa Agropecuária Brasileira 46:772-775.

Aguilera GAH, Malta AWO, Flores MP, Almeida VS, Nick C, Xavier CAD, Silva DJH, Zerbini FM (2011) Characterization of the resistance of tomato accessions from the BGH-UFV to the geminivírus Tomato yellow spot virus. Revista Brasileira de Agropecuária Sustentável 1:66-70.

Quiñones M, Arana F, Alfenas-Zerbini P, Soto M, Ribeiro D, Diaz A, González D, Carbonell J, Depestre T, Zerbini FM (2011) First report of in sweet pepper in Cuba. New Disease Reports 24:16.

Silva SJC, Castillo-Urquiza GP, Hora Junior BT, Assunção IP, Lima GSA, Mizubuti ESG, Zerbini FM (2011) High genetic variability and recombination in a begomovirus population infecting the ubiquitous weed *Cleome affinis* in northeastern Brazil. Archives of Virology 156:2205-2213.

Fernandes FR, Albuquerque LC, Oliveira CL, Cruz ARR, Rocha WB, Pereira TG, Naito FYB, Dias NM, Nagata T, Faria JC, Zerbini FM, Aragão FJL, Inoue-Nagata AK (2011) Molecular and biological characterization of a new Brazilian begomovirus, *Euphorbia yellow mosaic virus* (EuYMV), infecting *Euphorbia heterophylla* plants. Archives of Virology 156:2063-2069.

Rocha CS, Xavier CAD, Lima ATM, Silva FN, Zerbini FM (2011) Molecular characterization of the begomovirus *Tomato mottle leaf curl virus* (TMoLCV). Virus Reviews and Research 16:on line.

Ferreira SS, Barros DR, Almeida MR, Zerbini FM (2010) Characterization of Passion fruit severe leaf distortion virus, a novel begomovirus infecting passion fruit in Brazil, reveals a close relationship with tomato-infecting begomoviruses. Plant Pathology 59:221-230.

Book and Book Chapters (from 2010 to 2014)

Zerbini FM, Silva FN, Castillo-Urquiza GP, Basso MF (2014) Transgenic plants. In: Borém A, Fritsche-Neto R (Eds.). Biotechnology and Plant Breeding: Applications and Approaches for Developing Improved Cultivars. Vol.1. Elsevier Academic Press, New York, NY, USA. pp. 179-199.

Zerbini FM, Silva FN, Castillo-Urquiza GP, Basso MF (2013) Plantas Transgênicas. In: Borém A, Fritsche-Neto R (Eds.). Biotecnologia Aplicada ao Melhoramento de Plantas. Vol. 1. Suprema Gráfica e Editora, Viçosa, MG, BRA. pp. 229-265.

Zerbini FM, Alfenas-Zerbini P (2013) Supressores de RNAi. In: Pereira TC (Ed.). Introdução à Técnica de Interferência por RNA - RNAi. Vol. 1. Sociedade Brasileira de Genética, Ribeirão Preto, SP, BRA. pp. 101-116.

Brown J, Fauquet CM, Briddon R, Zerbini FM, Moriones E, Navas-Castillo J (2012) Family Geminiviridae. In: King AMQ, Adams MJ, Carstens EB, Lefkowitz EJ (Eds.). Virus Taxonomy. Ninth Report of the International Committee on Taxonomy of Viruses. Vol. 1. Elsevier Academic Press, Londres, UK. pp. 351-373.

Adams MJ, Zerbini FM, French R, Rabenstein F, Stenger DC, Valkonen JPT (2012) Family Potyviridae. In: King AMQ, Adams MJ, Carstens EB, Lefkowitz EJ (Eds.). Virus Taxonomy. Ninth Report of the International Committee on Taxonomy of Viruses. Vol. 1. Elsevier Academic Press, Londres, UK. pp. 1069-1089.

Silva FN, Lima ATM, Zerbini FM (2012) Sintomas induzidos por vírus, viroides, fitoplasmas e espiroplasmas em plantas. In: Zambolim L, Jesus Júnior WC, Pereira OL (Eds.). O Essencial da Fitopatologia - Agentes Causais. Vol. 1. Suprema Gráfica e Editora, Viçosa, MG, BRA. pp. 161-176.

APPENDIX 2

Syllabi for courses included in the dual-degree required curriculum
List of courses included:

PPA 500
PPA 600
PPA 640
PPA 641
PPA 673
FIP 610
FIP 620
FIP 630
FIP 640
FIP 680
FIP 701

PPA (PLS 640) – Identification of Plant Diseases, Fall Semester, 2014
Syllabus and Course Requirements

INSTRUCTOR

Sladana Bec, Dept. of Plant Pathology, 211 Plant Science Building
Telephone: (859) 536-2554; e-mail: sladanabec@gmail.com
Nicole Ward Gauthier, Dept. of Plant Pathology, 204 Plant Science Building
Telephone: (859) 218-0720; e-mail: Nicole.ward@uky.edu

Office hours: please contact for arrangements

PURPOSE

PPA (PLS) 640 is intended to give graduate students practical exposure to plant pathology and science-based diagnostics. The objectives of PPA (PLS) 640 are to learn the processes involved in diagnosing plant diseases and making control recommendations, recognize common diseases found on various hosts in Kentucky, understand the workings of Extension plant pathology, and be exposed to the Kentucky agricultural industry.

PREREQUISITES

The students are required to have taken PPA 400G (Principles of Plant Pathology) or its equivalent from another institution. Students are expected to be familiar with microbiology, including mycology, and microscopy.

CLASS MEETINGS

Class will be held in the Ag North Greenhouse Teaching Classroom / Laboratory. The classroom portion of PPA/PLS 640 will meet once or twice per week from June 9 through August 12, and we will hold two class meetings after the beginning of the Fall 2014 semester.

Each class will consist of lectures, demonstrations, diagnosis of specimens, and discussion. We will also take field trips to view diseases and agricultural production around Kentucky. Date, duration, and location of these trips will be listed in the class schedule to be distributed on the first day of class.

Classroom space and supplies will be provided for students to examine specimens and make cultures. Basic reference materials will be provided in the class library. Additional reference materials may be used in the Plant Disease Diagnostic Laboratory; however, these references are not to be removed from the laboratory. Students will be allotted space in the Greenhouse Teaching Classroom/Laboratory walk-in cold room for storage of specimens. *Students are encouraged, but not required, to bring a digital camera to each session*.

Students will be expected to read the Kentucky Pest News (KPN) newsletter. Issues of KPN can be obtained by subscribing to the KPN Listserv at www.uky.edu/kpn. From the main menu, select 'Subscribe' and follow instructions. Past issues of KPN are available under 'Previous Issues' at www.uky.edu/kpn.

STUDENT RESPONSIBILITIES

General. Using specimens provided by the instructors, students will diagnose samples during lab sessions. Students will work on samples in groups of 2-3, and a brief, written report will be expected for each sample (example format will be provided). Disease reports are to be kept in a

lab notebook that will serve as a study guide for later exams, so each student will be expected to complete a report for each diagnosis. Each group will be responsible for presenting their findings to the class for ONE of the assigned samples (selected by the instructor), so that all samples are discussed before the end of the lab session. Each group member must participate in the presentation to the class.

Disease Collection. Each student must collect and diagnose 10 specimens of disease on different types of plants over the summer, as follows:
2 – field crops
2 – vegetable crops
2 – ornamentals and landscape/forest trees
2 – fruits
2 – turf and forages

The disease collection must be turned in by August 15. A complete collection will consist of fresh or preserved specimens along with supporting materials (illustrations of pathogen signs or digital images, diagnostic tests, etc.). A ***brief*** written report also is required that identifies each disease and its importance, the causal agent, symptoms and signs, disease cycle, and control measures. Diseases that have been diagnosed during class may be included in the disease collection; however, students must use materials that they have collected on their own or during field trips (not specimens provided during lab).

EXAMINATIONS

Students will be expected to understand and apply the general principles and practices of plant disease diagnosis. In addition, they will recognize or know how to diagnose the diseases of samples with which they have worked **plus** important diseases of other crops discussed by the instructor and other students. Students will also be expected to be familiar with information presented in the weekly Kentucky Pest News and other practical plant disease information introduced during class-related activities. **All examinations are 'open book' - the use of class notes is permitted.**

CRITERIA FOR GRADING STUDENTS IN PPA (PLS) 640

First examination: 100 points

Second examination: 100 points

Final examination: 100 points

Disease collection: 100 points
Score will be based on quality of specimens, accuracy of diagnoses, and quality of written reports (clear documentation of importance, disease cycles, symptoms, signs, identification, and management practices).

Class Participation: 100 points
Score will be based on class attendance (two excused absences are permitted during the semester; each additional absence will result in a loss of 10 class participation points), oral diagnostic reports, and participation in discussions during class or field trips.

PPA 654: Advanced Plant Disease Resistance

Semesters taught: Every fall.
Credit hours: 1
Prerequisites: PPA 400G, PPA 500, PPA 600
Requirement: Option to fulfill the requirement for two courses in Advanced Plant Pathology (PPA 65x)
Organizer and Instructor: Pradeep Kachroo
Major Teaching Objectives: Give student an in-depth understanding of the interaction between host and pathogen. Emphasis is on the host defense signaling.
Readings: At least 1 week before each lecture, students will be assigned one review paper and one recent research paper for that lecture.
Topics:

Lecture 1	Genetic analysis of plant disease interactions Gene for Gene interaction
Lecture 2	Mapping, map based cloning of genes,
Lecture 3	R gene structure and function
Lecture 4	Hypersensitive response, Lesion mimics
Lecture 5	Downstream signaling, signal transduction
Lecture 6	Signaling and disease resistance
Lecture 6	SA and disease resistance
Lecture 7	JA/ethylene and disease resistance
Lecture 8	**Midterm exam**
Lecture 9	FA signaling and disease resistance
Lecture 10	NO and disease resistance
Lecture 11	Cross talk and comparison of R signaling pathways against virus, bacterial, oomycete and fungal pathogens
Lecture 12	Virus-induced gene silencing
Lecture 13	Virus-induced gene silencing
Lecture 14	Resistance via tolerance

Assignments, Exams and Grades:

Participation: 40 pts
Midterm exam: 30 pts
Final exam: 30 pts
Grades: 90-100%, A; 80-89%, B; 70-79%, C; <70%, D

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM	Nº SHEET: / INITIALS:

IDENTIFICATION

COURSE: **PHYTOMYCOLOGY (Fitomicologia)**				CODE: **FIP 610**
DEPARTMENT: **PLANT PATHOLOGY (Fitopatologia)**				ADMINISTRATIVE UNIT CODE: **CCA**
DURATION IN WEEKS	NUMBER OF HOURS PER WEEK			TOTAL NUMBER OF HOURS
15	LECTURES: **02**	LABORATORIES: **04**	TOTAL: **06**	**90**

CREDIT NUMBER: **04**	SEMESTER: **1**
PRE-REQUISITES	PRE OR CO-REQUISITES

CONTENT

Evolution, systematics and classification of the fungi. Fungal genetics. Fungal physiology. Fungi of the Kingdom Protista. Fungi of the Kingdom Chromista / Straminipila. Fungi of the Kingdom Fungi. Control of fungal diseases.

OFFERED TO THE FOLLOWING PROGRAMS (ONLY FOR UNDERGRADUATE LEVEL COURSES)

1.	( )	7.	( )
2.	( )	8.	( )
3.	( )	9.	( )
4.	( )	10.	( )
5.	( )	11.	( )
6.	( )	12.	( )

(OB)= OBLIGATORY (OP)= OPTIONAL

Nº DA ATA DA REUNIÃO: _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
CHEFE DO DEPARTAMENTO

ALTERAÇÃO APROVADA PELO ☐ CTP ☐ CTG

Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
PRESIDENTE DO CONSELHO

APROVAÇÃO DA COORDENAÇÃO DE ENSINO, PESQUISA E EXTENSÃO - CEPE

Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO _____/_____/_____

_____
SECRETÁRIO DE ÓRGÃOS COLEGIADOS

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INIITIALS:

COURSE: **PHYTOMYCOLOGY**	CODE: **FIP 610**

UNITS AND TOPICS	■ LECTURES	□ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
1. Evolution, systematics and classification of the fungi.			02
2. Fungal genetics.			02
3. Fungal physiology.			02
4. Fungi of Kingdom Protista.			01
5. Fungi of the Kingdom Chromista / Straminipila			03
6. Fungi of the Kingdom Fungi:			16
6.1. Phylum Chytridiomycota;			
6.2. Phylum Zygomycota;			
6.3. Phylum Ascomycota;			
6.4. Phylum Basidiomycota.			
7. Controle de doenças fúngicas			04

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: / INITIALS:

COURSE: **PHYTOMYCOLOGY**	CODE: **FIP 610**

UNITS AND TOPICS	☐ LECTURES	■ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01. Basic methods in mycology: collection and processing, microscopy and literature.			04
02. Fungal genetics lab: isolation, cultivation, and conservation of cultures.			04
03. Fungal genetics lab.			04
04. Observation of mixomycetes			02
05. Genera *Pythium* and *Phytophthora*.			02
06. Peronosporales			04
07. Chytridiomycota.			02
08. Zygomycota.			02
09. Anamorphs.			16
10. Ascomycota.			08
11. Basidiomycota			08
12. Control of fungal diseases.			04

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	BIBLIOGRAPHIC REFERENCES	Nº SHEET: / INITIALS:

CODE: **PHYTOMYCOLOGY**	CODE: **FIP 610**

ALEXOPOULOS, C.J., MIMS, C.W. & BLACKWELL, M. 1996. Introductory Mycology. John Wiley & Sons, New York.

CARLILE, M.J., WATKINSON, S.C. & GOODAY, G.W. 2001. The Fungi. Academic Press.

DIGHTON, J. 2001. Fungi in Ecosystem Processes. Marcel Dekker.

HOLLYDAY, P. 1980. Fungus Diseases of Tropical Crops. Cambridge University Press.

GAMS, W., HOEKSTRA, E.S. & APTROOT, A. 1998. CBS Course of Mycology. Centraalbureau voor Schimmelcultures.

HENNEN, J. et al. 2005. Catalogue of the Species of Plant Rust Fungi (Uredinales) of Brazil. Jardim Botânico do Rio de Janeiro (disponível on-line http://www.jbrj.gov.br/).

KIRK, P.F., CANNON, P.F., MINTER, D.W. & STALPERS, J.A. 2008 *Dictionary of the Fungi.* CAB INTERNATIONAL MENDES et al. 1998. Fungos em Plantas no Brasil. EMBRAPA.

MUELLER, G.M., BILLS, G.F. & FOSTER, M.S. 2004. Biodiversity of fungi: inventory and monitoring methods. Elsevier Academic Press.

WALLER, J. M., LENNÉ, J.M., WALLER, S.J. (Eds). 2001. *Plant Pathologist's Pocketbook.* Oxford University Press.

WEBSTER, J. & WEBER, R.W.S. 2007. *Introduction to Fungi*. Cambridge University Press.

_____/_____/_____

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM	Nº SHEET: / INITIALS:

IDENTIFICATION

COURSE:	CODE:
PHYTONEMATOLOGY (Fitonematologia)	**FIP 620**
DEPARTMENT: **PLANT PATHOLOGY (Fitopatologia)**	ADMINISTRATIVE UNIT CODE: **CCA**

DURATION IN WEEKS	NUMBER OF HOURS PER WEEK			TOTAL NUMBER OF HOURS
15	LECTURES: **02**	LABORATORIES: **02**	TOTAL: **04**	**60**

CREDIT NUMBER: **03**	SEMESTER: **1**
PRE-REQUISITES	PRE OR CO-REQUISITES

CONTENT

History and importance. Morphological and biological characteristics of the nematodes. Ecological relationships. Pathogenic relationships. Interaction of nematodes with other pathogens. Basic considerations for the control of nematodes. Prevention of the spread. Reducing nematode populations through soil management and cultural practices. Control by heat. Biological control of nematodes. Control by chemicals. Use of resistant varieties.

OFFERED TO THE FOLLOWING PROGRAMS (ONLY FOR UNDERGRADUATE LEVEL COURSES)

1.	( )	7.	( )
2.	( )	8.	( )
3.	( )	9.	( )
4.	( )	10.	( )
5.	( )	11.	( )
6.	( )	12.	( )

(OB)= OBLIGATORY (OP)= OPTIONAL

Nº DA ATA DA REUNIÃO: _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
CHEFE DO DEPARTAMENTO

ALTERAÇÃO APROVADA PELO ☐ CTP ☐ CTG	
Nº DA ATA DA REUNIÃO _____/_____	DATA DE APROVAÇÃO: _____/_____/_____
_____ PRESIDENTE DO CONSELHO	

APROVAÇÃO	DA COORDENAÇÃO DE ENSINO, PESQUISA E EXTENSÃO - CEPE
Nº DA ATA DA REUNIÃO _____/_____	DATA DE APROVAÇÃO _____/_____/_____
_____ SECRETÁRIO DE ÓRGÃOS COLEGIADOS	

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: | INIITIALS:

COURSE: **PHYTONEMATOLOGY**	CODE: **FIP 620**

UNITS AND TOPICS	■ LECTURES	□ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
1 History and significance. 1.1. History of nematology. 1.2. Importance of nematodes to agriculture. 1.3. The nematological literature: books, manuals, journals and other references.			02
2. Morphological and biological characteristics of nematodes: 2.1. Anatomy and morphology; 2.2. Types of nematodes and general eating habits; 2.3. Life cycle of parasitic plant species.			06
3 Ecological Relations.: 3.1. Vertical and horizontal distribution of nematodes in the soil; 3.2. Populations and survival; 3.3. Soil environment; 3.4. Plant environment.			02
4 Pathogenic Relations.: 4.1. Symptoms of diseases caused by nematodes; diagnosis; 4.2. Histopathology of plants parasitized by nematodes; 4.3. Biochemical Aspects of diseases caused by nematodes; 4.4. The verification of the plant pathogenic nematodes. Terminology, Methodology.			02
5 Interaction of nematodes with other pathogens: 5.1. Fungi, bacteria and nematodes; 5.2. Transmission of viruses.			04
6 Basic considerations for the control of nematodes: 6.1. Economic aspect; 6.2. Integrated control; 6.3. Annual crops and perennial crops; 6.4. Eradication versus coexistence.			01
7 Prevention of spread: 7.1. Dissemination processes; 7.2. Natural barriers; 7.3. Practices to restrict the spread. Quarantine. Treatment of plants or plant organs with hot water and chemicals. Use of healthy seedlings.			01

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE: **PHYTONEMATOLOGY**	CODE: **FIP 620**

UNITS AND TOPICS	■ LECTURES	□ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
8 Reduction of nematode population through soil management practices and cultures: 8.1. Fallow; 8.2. Organic fertilization; 8.3. Crop rotation; 8.4. Antagonistic plants; 8.5. Flooding; 8.6. Planting date; 8.7. Destruction or removal of infected plants; 8.8. Other practices.			04
9 Control by heat: 9.1. Heat transfer in the soil; 9.2. Methods and equipments; 9.3. Solar thermotherapy (soil solarization); 9.4. Effects of heat on soil properties.			02
10. Biological control of nematodes: Nematophagous fungi. General characteristics. Main genera and species; Other organisms (bacteria, viruses, nematodes, protozoa, etc.). Current situation and future prospects.			02
11. Control by chemicals: Characteristics of the major nematicides; Techniques and dosages of application; Ecological considerations; Problems of residues in food.			02
12 Use of resistant varieties: Development of new varieties; The nature of resistance; The genetic basis for resistance.			02

_____
DEPARTMENT CHAIRMAN

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE: **PHYTONEMATOLOGY**	CODE: **FIP 620**

UNITS AND TOPICS	☐ LECTURES	LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01 Sample collection and extraction of nematodes: 1.1. Sampling techniques; 1.2. Methods of extraction of nematodes from soil; 1.3. Methods of extraction of nematodes from plant tissue.			04
02 Preparation of slides for examination under a microscope: 2.1. Temporary mounts; 2.2. Permanent mounts; 2.3. Staining of nematodes "in situ" in plant tissues.			04
03 The soybean cyst nematode (*Heterodera glycines*): 3.1. Techniques for the extraction of larvae, cysts and eggs; 3.2. Resistance of soybean cultivars to nematode; 3.3. Race identification.			04
04 The root-knot nematodes (*Meloidogyne* spp.): 4.1. Techniques for the extraction of eggs and inoculation of plants. Staining of egg masses; 4.2. Preparation of perineal cuts; 4.3. Polyacrylamide gel electrophoresis for species identification; 4.4. Identification of races.			04
05. Important nematodes: features and significance: 5.1. *Pratylenchus* and *Radopholus*; 5.2. *Ditylenchus*, *Anguina*, *Bursaphelenchus* and *Aphelenchoides*; 5.3. *Rotylenchulus* and *Tylenchus*; 5.4. *Criconemella*, *Paratylenchus*, *Hemicycliophora* and *Hemicriconemoides*; 5.5. *Helicotylenchus*, *Rotylenchus*, *Hoplolaimus*, *Scutellonema*, *Aorolaimus* and *Tylenchorhynchus*; 5.6. *Longidorus*, *Paralongidorus*, *Trichodorus*, *Paratrichodorus* and *Xiphinema*			14

DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	BIBLIOGRAPHIC REFERENCES	Nº SHEET: INITIALS:

CODE: **PHYTONEMATOLOGY**	CODE: **FIP 620**

CHEN, Z. X.; CHEN, S. Y. & DICKSON, D. W. 2004. (ed.) Nematology: Advances and Perspectives Vol 1: Nematode Morphology, Physiology and Ecology. CABI Publishing. Cambridge, MA, USA. 640 p.

CHEN, Z. X.; CHEN, S. Y. & DICKSON, D. W. 2004. (ed.) Nematology: Advances and Perspectives Vol II: Nematode Management and Utilization. CABI Publishing. Cambridge, MA, USA. 608 p.

GAUGLER, R. & BILGRAMI, A. L. 2004. (Editors) Nematode Behaviour. CABI. 432 p.

LUC, M., SIKORA, R. A. & BRIDGE, J. 2005. (ed.) Plant parasitic nematodes in subtropical and tropical agriculture. 2nd edition. CABI. 871 p.

MAI, W. F. & MULLIN, P. G. 1996. Plant-Parasitic nematodes: a pictorial key to genera. 5th. Edition. Cornell Univ. Press. Ithaca. 277 p.

PERRY, R. N. & Moens, M. 2006. (ed.) Plant Nematology. CABI. 480 p.

REGNAULT-ROGER, C., PHILOGÈNE, B. J. R. & VINCENT, C. 2005. (ed.) Biopesticides of Plant Origin. Lavoisier 310 p.

SIDDIQI, M. R. 2000. Tylenchida: parasites of plants and insects. 2nd edition. CABI. 833 p.

SOUTHEY, J. F. (ed.) 1986. Laboratory Methods for work with Plant and Soil Nematodes. Ministry of Agriculture, Fisheries and Food, London, England. 193 p.

ZUCKERMAN, B. M., MAI, W. F. & KRUSBERG, L. R. 1990. Plant Nematology Laboratory Manual. The University of Massachussets Agricultural Experiment Station. Massachusetts, USA. 252 p.

_____/_____/_____

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: / INIITIALS:

COURSE: **PLANT VIROLOGY**	CODE: **FIP 630**

UNITS AND TOPICS	■ LECTURES	☐ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
1. History and importance of plant virology.			02
2. Symptoms induced by plant viruses in their hosts: 2.1. Macroscopic alterations; 2.2. Microscopic alterations.			02
3. Morphology and structure: 3.1. Morphology; 3.2. Chemical composition and structure of the capsid; 3.3. Nomenclature and taxonomy.			02
4. Strategies of viral replication: 4.1. Stages of the process of establishment of systemic infection; 4.2. Virus replication: Positive RNA viruses; 4.3. Virus replication: Negative RNA viruses; 4.4. Virus replication: DNA genome.			10
5. Cell-to-cell and long-distance movement: 5.1. Cell-to-cell movement via tubules; 5.2. Cell-to-cell movement via increase of plasmodesmal SEL; 5.3. Long-distance movement.			02
6. Subviral infectious agents: 6.1. Viroids; 6.2. Satellite viruses; 6.3. Satellite RNAs.			02
7. Natural transmission: 7.1. Transmission by contact and by seeds; 7.2. Transmission by vectors.			04
8. Control of plant virus diseases. 8.1. Vector control; 8.1. Use of virus-free propagation material; 8.2. Natural resistance; 8.3. Pathogen-derived resistance.			06

DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE: **PLANT VIROLOGY**	CODE: **FIP 630**

UNITS AND TOPICS	☐ LECTURES	LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01. Artificial transmission of plant viruses; host range.			02
02. Purification of a rod-shaped virus.			04
03. Purification of an isometric virus.			04
04. Optical and electronic microscopy: Observation of cytoplasm inclusions and viral particles.			02
05. Cloning a fragment of a viral genome: 5.1. Extraction and whole-genome amplification of a begomovirus. 5.2. Extraction of viral RNA. 5.3. RT-PCR: Amplification of fragments of a viral genome. 5.4. Ligation of amplified products into plasmid vector. 5.5. Transformation of *E. coli*. 5.6. Extraction and electrophoretic analysis of recombinant plasmids.			14
06. Analysis of viral sequences.			02
07. Identification of viral suppressors of RNA silencing.			02

DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	BIBLIOGRAPHIC REFERENCES	Nº SHEET: | INITIALS:

CODE: **PLANT VIROLOGY**	CODE: **FIP 630**

FAUQUET, C.M., MAYO, M.A., MANILOFF, J., DESSELBERGER, U. & BALL, L.A. (Eds.) Virus Taxonomy. Eighth Report of the International Committee on Taxonomy of Viruses. San Diego, EUA: Elsevier Academic Press. 1259p. 2005.

HOGENHOUT, S.A., AMMAR, E.D., WHITFIELD, A.E. & REDINBAUGH, M.G. Insect vector interactions with persistently transmitted viruses. Annu. Rev. Phytopathol. 46:327-359. 2008.

HULL, R. Matthew's Plant Virology (4a ed.). Londres, Inglaterra: Academic Press. 1001p. 2002.

LEWIN, B. Genes VIII. Upper Saddle River, EUA: Pearson Prentice Hall. 1027p. 2004.

NG, J.C.K. & FALK, B.W. Virus-vector interactions mediating nonpersistent and semipersistent transmission of plant viruses. Annual Review of Phytopathology 44:183-212. 2006.

ROJAS, M.R., HAGEN, C., LUCAS, W.J. & GILBERTSON, R.L. Exploiting chinks in the plant's armor: Evolution and emergence of geminiviruses. Annual Review of Phytopathology 43:361-394. 2005.

SAMBROOK, J. & RUSSEL, D. Molecular Cloning - A Laboratory Manual (3a ed.). Cold Spring Harbor, EUA: Cold Spring Harbor Laboratory Press. 2344p. 2001.

SIMON, A.E., ROOSSINCK, M.J. & HAVELDA, Z. Plant virus satellite and defective interfering RNAs: New paradigms for a new century. Annual Review of Phytopathology 42:415-437. 2004.

ZERBINI, F.M. &; ALFENAS-ZERBINI, P. Métodos em virologia vegetal. pp. 293-358 In: Alfenas, A.C. & Mafia, R.G. (Eds.) Métodos em Fitopatologia. Viçosa, MG: Editora UFV. 2007.

ZERBINI, F.M., ALFENAS, P.F. & ANDRADE, E.C. O silenciamento de RNA como um mecanismo de defesa de plantas a vírus. Revisão Anual de Patologia de Plantas 13:191-246. 2005.

____/____/____

DEPARTMENT CHAIR

Excluído: ¶
¶
¶
¶
¶
¶
¶
¶
¶
¶
¶

Excluído: ¶

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM	Nº SHEET: / INITIALS:

IDENTIFICATION

COURSE:	CODE:
PLANT PATHOGENIC BACTERIA (Bactérias Fitopatogênicas)	**FIP 640**
DEPARTMENT: **PLANT PATHOLOGY (Fitopatologia)**	ADMINISTRATIVE UNIT CODE: **CCA**

DURATION IN WEEKS	NUMBER OF HOURS PER WEEK			TOTAL NUMBER OF HOURS
15	LECTURES: **02**	LABORATORIES: **02**	TOTAL: **04**	**60**

CREDIT NUMBER: **03**	SEMESTER: **2**
PRE-REQUISITES	PRE OR CO-REQUISITES

CONTENT

History and economic importance. Anatomy and morphology of the bacterial cell: physiology, bacterial metabolism and growth and main recombination processes. Taxonomy of plant pathogenic bacteria. Symptomatology. Penetration, colonization, movement and multiplication of bacteria during plant infection and histopathological aspects of the colonization process. Seed pathology of plant pathogenic bacteria. Survival and spread of plant pathogenic bacteria: life cycle and its implications to spread and survival. Control methods for bacterial plant diseases.

OFFERED TO THE FOLLOWING PROGRAMS (ONLY FOR UNDERGRADUATE LEVEL COURSES)

1.	( )	7.	( )
2.	( )	8.	( )
3.	( )	9.	( )
4.	( )	10.	( )
5.	( )	11.	( )
6.	( )	12.	( )

(OB)= OBLIGATORY (OP)= OPTIONAL

Nº DA ATA DA REUNIÃO: _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
CHEFE DO DEPARTAMENTO

ALTERAÇÃO APROVADA PELO ☐ CTP ☐ CTG	APROVAÇÃO DA COORDENAÇÃO DE ENSINO, PESQUISA E EXTENSÃO - CEPE
Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO: _____/_____/_____	Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO _____/_____/_____
_____ PRESIDENTE DO CONSELHO	_____ SECRETÁRIO DE ÓRGÃOS COLEGIADOS

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: | INIITIALS:

COURSE: **PLANT PATHOGENIC BACTERIA**	CODE: **FIP 640**

UNITS AND TOPICS	■ LECTURES	□ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
1. History and economic importance: 1.1. Introduction; 1.2. General recommendations; 1.3. Bacteriology as a science; 1.4. Economic importance of plant bacterial diseases; 1.5. Plant bacteriologists in Brazil and in the world.			02
2. Anatomy and morphology of the bacterial cell: physiology, bacterial metabolism and growth and main recombination processes			05
3. Taxonomy of plant pathogenic bacteria: 3.1. Positioning of the bacteria in the world of living beings; 3.2. Procaryotes and eucaryotes; 3.3. Taxonomy of the plant pathogenic genera and species; 3.4. The concept of pathovar.			05
4. Symptomatology: 4.1. Main types of symptoms; 4.2. Elementary concepts of physiology of parasitism; 4.3. Primary and secondary factors of pathogenesis; 4.4. Compatible and incompatible associations; 4.5. Hypersensitivity.			04
5. Penetration, colonization, movement and multiplication of bacteria during plant infection and histopathological aspects of the colonization process.			02
6. Seed pathology of plant pathogenic bacteria: 6.1. Association of bacteria with seeds and its plant pathological and epidemiological significance; 6.2. Seed treatment as eradication measure; 6.3. Methods of detection of plant pathogenic bacteria in seeds.			04
7. Survival and spread of plant pathogenic bacteria: life cycle and its implications to spread and survival.			04
8. Control methods of bacterial plant diseases: 8.1. General measures; 8.2. Chemical and biological control; 8.3. Seed certification; 8.4. Antibiotics; 8.5. Induced resistance and its implications; 8.6. Plant growth promoting rhizobacteria as biological control agents.			04

DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE: **PLANT PATHOGENIC BACTERIA**	CODE: **FIP 640**

UNITS AND TOPICS	☐ LECTURES	LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01. Dilution of colonies.			02
02. Isolation of plant pathogenic bacteria from infected plant organs.			02
03. Hypersensitivity test.			02
04. Artificial inoculation.			02
05. Bacterial growth curve.			04
06. Preservation of bacterial cultures by different methods.			02
07. Visualization of bacterial cell and of some structures.			02
08. Seed pathology – rapid detection.			02
09. Determination of a plant pathogenic genus.			02
10. Determination of a plant pathogenic species.			04
11. Bioassays with antibiotics and their application in plant pathology.			02
12. Bacteriocins – bioassays for synthesis detection.			02
13. Bacteriophages – isolation, detection and specificity.			02

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	BIBLIOGRAPHIC REFERENCES	Nº SHEET: | INITIALS:

CODE: **PLANT PATHOGENIC BACTERIA**	CODE: **FIP 640**

BRENNER, D. J.; KRIEG, N. R. & STALEY, J. T. (Eds.). Bergey's Manual of Systematic Bacteriology, Vol. 2, The Proteobacteria (Parts A, B & C), 2nd ed. Springer, 2005. 2816p.

CROSA, J.H. & KADO, C. I. (eds.). Molecular mechanisms of bacterial virulence (Developments in Plant Pathology, Vol 3). Boston, Kluwer Academic Publishers, 2002. 704p.

GNANAMANICKAM, S. S. (Ed.) Plant-Associated Bacteria, Dordrecht, Springer, 2006. 724p.

HAMPTON, R.; BALL, E.; DeBOER, S. (eds.). Serological methods for detection and identification of viral and bacterial plant pathogens - a laboratory manual. St. Paul, APS Press, 1990. 387p.

JACKSON, R. W. (Ed.). Plant Pathogenic Bacteria: Genomics and Molecular Biology. Norfolk, Caister Academic Press, 2009. 330p.

JANSE, J. D. Phytobacteriology: Principles and Practice. Wallingford, Cabi Publishing, 2006. 360p.

KLEMENT, Z.; RUDOLPH, K.; SANDS, D.C. (eds.). Methods in phytobacteriology. Budapest, Akadémiai Kiadó, 1990. 568p.

MADIGAN, M. M.; MARTINKO, J. DUNLAP, P.V. & CLARK, D.P. Brock biology of microorganisms. 12th ed. Upper Saddle River, Benjamin Cummings, 2008. 1168p.

NESTER, E.; GORDON, M. P. & KERR, A (Eds.). Agrobacterium Tumefaciens: From Plant Pathology To Biotechnology. St. Paul, APS Press, 2005. 319p.

ROSSELLÓ-MORA, R. & AMANN, R. The species concept for prokaryotes. FEMS Microbiology Reviews, 25: 39-67, 2001.

SCHAAD, N.W.; JONES, J.B. & CHUN, W. (eds). Laboratory guide for identification of plant pathogenic bacteria. 3rd ed. St. Paul, APS Press, 2001. 373p.

_____/_____/_____

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM	Nº SHEET: / INITIALS:

IDENTIFICATION

COURSE:	CODE:
POPULATION BIOLOGY OF PLANT PATHOGENS (Biologia de Populações de Fitopatógenos) * *** THIS COURSE IS TAUGHT IN ENGLISH**	**FIP 680**
DEPARTMENT: **PLANT PATHOLOGY (Fitopatologia)**	ADMINISTRATIVE UNIT CODE: **CCA**

DURATION IN WEEKS	NUMBER OF HOURS PER WEEK			TOTAL NUMBER OF HOURS
15	LECTURES: **02**	LABORATORIES: **02**	TOTAL: **04**	**60**

CREDIT NUMBER: **03**	SEMESTER: **1 (even years)**
PRE-REQUISITES	PRE OR CO-REQUISITES

CONTENT

Concepts of population biology. Basic concepts of evolution. Quantifying genetic diversity. Recombination and variability of populations. Genetic drift and variability of populations. Mutations and variability of populations. Migration and population structure. Selection and variability of populations.

OFFERED TO THE FOLLOWING PROGRAMS (ONLY FOR UNDERGRADUATE LEVEL COURSES)

1.	( )	7.	( )
2.	( )	8.	( )
3.	( )	9.	( )
4.	( )	10.	( )
5.	( )	11.	( )
6.	( )	12.	( )

(OB)= OBLIGATORY (OP)= OPTIONAL

Nº DA ATA DA REUNIÃO: _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
CHEFE DO DEPARTAMENTO

ALTERAÇÃO APROVADA PELO ☐ CTP ☐ CTG

Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
PRESIDENTE DO CONSELHO

APROVAÇÃO DA COORDENAÇÃO DE ENSINO, PESQUISA E EXTENSÃO - CEPE

Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO _____/_____/_____

_____
SECRETÁRIO DE ÓRGÃOS COLEGIADOS

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: | INIITIALS:

COURSE: **POPULATION BIOLOGY OF PLANT PATHOGENS**	CODE: **FIP 680**

UNITS AND TOPICS	■ LECTURES	□ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01. Concepts of population biology: 1.1 Terminology 1.2 Introduction to population biology: history, names and concepts			02
02. Evolution: basic concepts			04
03. Quantifying genetic diversity			04
04. Recombination: 4.1. Hardy-Weinberg equilibrium; 4.2. Finite populations, panmictic populations, sexual x clonal; 4.3. How to detect and quantify recombination.			04
05. Genetic drift and variability of populations: 5.1. Finite populations and genetic drift; 5.2. Identity by descent and endogamy; 5.3. How to detect genetic drift.			04
06. Mutation and variability: 6.1. Mutation models; 6.2 Quantification of mutation rates.			04
07. Migration and population structure. 7.1. Migration models; 7.2. Migration and genetic drift; 7.3. How to estimate migration between populations.			04
08. Selection: 8.1. Selection models 8.2. The concept of fitness, 8.3. Selection x (drift, recombination, mutation and gene flow), 8.4. Selection estimates in populations.			04

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE:	CODE:
POPULATION BIOLOGY OF PLANT PATHOGENS	**FIP 680**

UNITS AND TOPICS	☐ LECTURES	LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01. Critical analysis of scientific articles – exercise.			04
02. Quantification of genetic diversity using R (RStudio) and DNAsp			02
03. Recombination detection and quantification methods			04
04. Genetic drift			04
05. Quantitative methods to estimate mutation			04
06. Quantitative methods to estimate migration rates			04
07. Detecting and quantifying selection			04
08. Coalescent-based methods			04

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	BIBLIOGRAPHIC REFERENCES	Nº SHEET: / INITIALS:

CODE: **PHYTOPATHOGENIC BACTERIA**	CODE: **FIP 640**

Charlesworth, B. Fundamental concepts in genetics: effective population size and patterns of molecular evolution and variation. Nat. Rev. Genet. 10:195-205. 2009

Garrett, K. A., Hulbert, S. H., Leach, J. E. & Travers, S. E. Ecological genomics and epidemiology. Eur. J. Plant Pathol 115:31-51. 2006.

Hartl, D. L. & Clark, A. G. Principles of population genetics. 4th Sinauer Associated, Inc, Sunderland. 2007.

Nei, M. & Kumar, S. Molecular evolution and phylogenetics. Oxford University Press, New York. 2000.

Meeûs, T. D., McCoy, K. D., Prugnolle, F., Chevillon, C., Durand, P., Hurtrez-Boussès, S. & Renaud, F. Population genetics and molecular epidemiology or how to "débusquer la bête". Inf. Genetics Evol. 7:308-332. 2007.

Milgroom, M. G. & Peever, T. L. Population biology of plant pathogens. The synthesis of plant disease epidemiology and population genetics. Plant Dis 87:608-617. 2003.

Orr, H. A. Fitness and its role in evolutionary genetics. Nat. Rev. Genet. 10:531-539. 2009.

Stukenbrock, E. H. & McDonald, B. A. Population genetics of fungal and oomycete effectors involved in gene-for-gene interactions. Mol. Plant Microbe Interact. 22:371-380. 2009.

Wakeley, J. Coalescent Theory: An Introduction. Roberts & Company Publishers, Village. 2008.

Waples, R. S. & Gaggiotti, O. What is a population? An empirical evaluation of some genetic methods for identifying the number of gene pools and their degree of connectivity. Mol. Ecol 15:1419-1439. 2006.

Yang, Z. Computational molecular evolution. Oxford University Press, Oxford. 2006.

_____/_____/_____

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM	Nº SHEET: INITIALS:

IDENTIFICATION

COURSE:	CODE:
HOST-PATHOGEN INTERACTIONS (Interação Patógeno-Hospedeiro)	**FIP 701**
DEPARTMENT: **PLANT PATHOLOGY (Fitopatologia)**	ADMINISTRATIVE UNIT CODE: **CCA**

DURATION IN WEEKS	NUMBER OF HOURS PER WEEK			TOTAL NUMBER OF HOURS
	LECTURES:	LABORATORIES:	TOTAL:	
15	**04**	**00**	**04**	**60**

CREDIT NUMBER: **04**	SEMESTER: **1**
PRE-REQUISITES	PRE OR CO-REQUISITES

CONTENT

Importance of studying host-pathogen interactions in plant pathology. The plant cell. Pathogenesis events. Enzymes. Toxins. Physiological changes in the plant during the infection. Resistance mechanisms. Induction of resistance.

OFFERED TO THE FOLLOWING PROGRAMS (ONLY FOR UNDERGRADUATE LEVEL COURSES)

1.	( )	7.	( )
2.	( )	8.	( )
3.	( )	9.	( )
4.	( )	10.	( )
5.	( )	11.	( )
6.	( )	12.	( )

(OB)= OBLIGATORY (OP)= OPTIONAL

Nº DA ATA DA REUNIÃO: _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
CHEFE DO DEPARTAMENTO

ALTERAÇÃO APROVADA PELO ☐ CTP ☐ CTG

Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO: _____/_____/_____

_____
PRESIDENTE DO CONSELHO

APROVAÇÃO DA COORDENAÇÃO DE ENSINO, PESQUISA E EXTENSÃO - CEPE

Nº DA ATA DA REUNIÃO _____/_____ DATA DE APROVAÇÃO _____/_____/_____

_____
SECRETÁRIO DE ÓRGÃOS COLEGIADOS

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE: **HOST-PATHOGEN INTERACTIONS**	CODE: **FIP 701**

UNITS AND TOPICS	■ LECTURES	□ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
01. Importance of studying host-pathogen interactions in plant pathology			1
02. The plant cell			1
03. Pathogenesis events: 3.1. Infection process: adhesion, germination, pre-penetration, penetration; 3.2. Molecular events during the recognition process of the host by the pathogen and of the pathogen by the host; 3.3. Signal cascades during host-pathogen interactions; 3.4. Host colonization and nutrient transfer.			14
04. Enzymes			6
05. Toxins			6
06. Physiological changes in the plant during the infection: 6.1. Transpiration and respiration; 6.2. Photosynthesis; 6.3. Translocation, permeability and metabolism of carbohydrates and other nutrients; 6.4. Enzyme activity and concentration of proteins, nucleic acids and growth regulators.			5
07. Resistance mechanisms: 7.1. Structural and/or pre-formed resistance mechanisms; 7.2. Biochemical and/or post-formed resistance mechanisms.			15
08. Induction of resistance 8.1. Induced systemic resistance 8.2. Acquired systemic resistance			12

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	COURSE PROGRAM (continued)	Nº SHEET: INITIALS:

COURSE:	CODE:
HOST-PATHOGEN INTERACTIONS	**FIP 701**

UNITS AND TOPICS	☐ LECTURES	■ LABORATORY SESSIONS	NUMBER OF HOURS PER WEEK
No lab sessions			

_____
DEPARTMENT CHAIR

UNIVERSIDADE FEDERAL DE VIÇOSA	REFERENCES	Nº SHEET: INITIALS:

CODE: **HOST-PATHOGEN INTERACTIONS**	CODE: **FIP 701**

Daniel, M.; Purkayastha, R.P. (eds.). Handbook of Phytoalexin - Metabolism and Action. Marcel Dekker, Inc. New York, 615 p., 1995.

Heitefuss, R.; Williams, P.H. (eds.). Physiological Plant Pathology. Encyclopedia of Plant Physiology, vol. 4, Springer. Verlag, New York, 890 p., 1976.

Huang, J.S. Plant Pathogenesis and Resistance. Biochemistry and Physiology of Plant-Microbe Interactions. Kluwer Academic Publishers, Norwell, Madison, 691 p., 2001.

Kamal, B.; Normand, B.; Daayf, F. (eds.). Molecular Plant-Microbe Interactions. CABI, 352 p., 2009.

Loon, L.C.; Kader, J.C.; Delseny, M. (eds.). Plant Innate Immunity. Advances in Botanical Research, vol. 51, Academic Press, 1st Edition, 400 p., 2009.

Sadik, T.; Elizabeth, B. Multigenic and induced systemic resistance in plants. Springer, 1st Edition, 521 p. 2007.

Sutic, D.; Sinclair, J.B. Anatomy and Physiology of Diseased Plants. CRC Press, Boca Raton, Florida, 208 p., 1990.

Upadhyay, R.K.; Mukerji, K.G. (eds.). Toxins in Plant Disease Development and Evolving Biotechnology, Science Publishers Inc., Enfield, 246 p., 1997.

Vidhyasekaran, P. Fungal Pathogenesis in Plants and Crops - Molecular Biology and Host Defense Mechanisms. Marcel Dekker Inc., New York, 553 p., 1997.

Walters, D.; Newton, A.; Lyon, G. (eds.). Induced resistance for plant defence: a sustainable approach to crop protection. Blackwell Publishing, 258 p., 2007.

_____/_____/_____

_____
DEPARTMENT CHAIR

APPENDIX 3

Guidelines for the PhD degree at UFV (in English).

UNIVERSIDADE FEDERAL DE VIÇOSA – UFV

OFFICE OF RESEARCH AND OF THE GRADUATE SCHOOL

Disclaimer: This is an edited version of the original document. Operational details were removed for the sake of brevity. Nevertheless, the original Portuguese and English versions can be obtained upon request (pr.ppg@ufv.br)

ACADEMIC REQUIREMENTS
GRADUATE PROGRAMS

ACADEMIC YEAR

The academic year at the Universidade Federal de Viçosa comprises two regular terms of academic activity and a special summer term.

1. Each regular term lasts a minimum of 100 (one hundred) days of school work, excluding the time reserved for exams.
2. The special summer term lasts at least 45 (forty-five) days.

COURSES AND PROGRAMS OFFERED

The University offers the following courses and programs:

1. Regular:

1.1. UNDERGRADUATE PROGRAMS: courses that provide university education and enable students to obtain academic degrees and professional practice. They are open to holders of certificate of completion of high school or equivalent, who have been approved in the UFV entrance examination, or bearers of a higher education diploma.

1.2. – "Stricto sensu" (Master's and Doctorate degree) and "Lato sensu" (Specialization/MBA)

GRADUATE PROGRAMS: programs and courses designed to candidates with college degree that meet the conditions prescribed for each case.

2. Special Courses:

2.1. EXTENSION COURSES: courses which are open to any applicant, although not at higher education level, aiming to spread knowledge and work techniques.

2.2. SEQUENTIAL COURSES: open to candidates who have graduated from high school or equivalent course and meet the requirements of the institution. These courses can be in-classroom, semi-in-classroom or distance based.

GENERAL RULES FOR *STRICTO SENSU* GRADUATE PROGRAMS

OBJECTIVES

Art. 1 – The *Stricto Sensu* Graduate Programs offered by the Universidade Federal de Viçosa are intended to provide broad and deep scientific and cultural background to students, through the developent of research and innovation ability, in different branches of knowledge.

STRICTO SENSU GRADUATE PROGRAMS

Art. 2 – The Stricto Sensu Graduate Programs comprise two levels of training, Master's and Doctoral degrees, which will confer the titles of *Magister Scientiae* (M.Sc.) and *Doctor Scientiae* (D.Sc), respectively.

CHAPTER I

GENERAL ORGANIZATION

Art. 3 - The minimum duration of the Master's and Doctoral Programs is one (1) and two (2) years and maximum of three (3) and 5 (five) years, respectively, counted from the date of admission.

Art. 4 - In addition to other requirements, students must take courses in the area of concentration (core group of courses defined by each Program) or in other konwledge fields that are related to the Program. The related fields are defined by each Program.
§ 1 – Courses of the area of concentration are those that characterize the field of study of the program, while disciplines of the related field are those that do not belong to this field, but are considered desirable or necessary to complete the training of students.
§ 2 - The disciplines in the area of concentration should total at least 50% (fifty percent) of the number of credits required.

...

CHAPTER II

TECHNICAL BOARD OF GRADUATE PROGRAMS

Art. 6 - The Council of Graduate Programs is in charge of the general teaching coordination of the Graduate Programs.

...

Art. 9 - The Council of Graduate Programs is in charge of the following activities:
a) preparation of the general schedule of the activities of the graduate programs, which will be submitted to approval by the Board of Teaching, Research and Extension;

b) elaboration of the Statute of Graduate Programs for approval by the Board of Teaching, Research and Extension, and edition of supplementary instructions;
c) establishment of the minimum requirements of the Graduate Programs, after the general standards established by law are met;
d) approval of the areas of concentration of Graduate Programs and the requirements for each of them;
e) accreditation of professionals who will work in the Graduate Programs;
f) approval of the names of candidates for graduate titles;
g) approval of the admission of students indicated by the respective coordinators of Graduate Programs;
h) approval of the number of vacancies for Graduate Programs;
i) promote the development of graduate activities;
j) make adjustments, agreements or arrangements, either academic or financial, for the support, cooperation and development of Graduate Programs;
k) evaluation of the operation and performance of Graduate Programs; and
l) performance of actions attributed to an informative and consultative organ of the Board of Teaching, Research and Extension, for graduate studies.

CHAPTER III
CREATION OF THE PROGRAMS

…

CHAPTER IV
COORDINATION OF THE PROGRAMS

Art. 13 - The teaching and scientific coordination of each Graduate Program, under the administration of the respective departments, will be exercised by a Coordinating Committee consisting of:
a) one (1) coordinator, as its chairman, appointed by the head of the department and appointed by the President of the University, whose name is included in a triple list organized by his/her peers;
b) three (3) professors elected by their peers; and
c) one (1) representative of the students in the Program, elected by his/her peers, and respective alternate.

...

Art. 19 - The Coordinating Committee is responsible for:
a) defining the disciplines of the area of concentration and related field, and establishing if they will be mandatory or optional (electives), which will be approved by competent authorities;
b) establishing specific requirements of the Program and submitting them to the Council of Graduate Programs;
c) appointing professors to the position of advisors of the Program;

d) organizing instructions, standards, plans or projects related to the Program and submitting them to the analysis of competent bodies;
e) proposing to the competent departments the creation of the disciplines required for the Program;
f) opining about the analytical program of the disciplines of the area of concentration or mandatory, suggesting modifications, when necessary, to achieve the objectives of the Program;
g) selecting qualified candidates for admission into the program;
h) establishing standards for the operation of Seminars;
i) proposing or opining about the exclusion of students from the Program due to academic or disciplinary reasons;
j) nominating candidates for scholarship granting;
l) assessing or proposing agreements or cooperative arrangements, either academic or financial, for the support or development of the Program;
m) receiving, assessing, resolving or referring, as appropriate, suggestions, complaints, representations or resources, from students or professors, related to any scientific-educational issue involving the Program; and
n) taking the appropriate actions attributed to an information and consulting organ related to the Technical Board of Graduate Studies.

Art. 20 - Coordinators have the following specific duties:

...

CHAPTER V

ADMISSION TO THE PROGRAMS

Art. 21 - Candidates who have graduated from a higher education institution may be admitted at Graduate Programs, since their curricula contain disciplines relevant to the intended Program.
§ 1 - In the case of undergraduate curricula without sufficient basis for the program claimed, students should take disciplines offered at undergraduate level, at the discretion of the Coordinator of the Program.
§ 2 – Candidates that have been disconnected from any Graduate Program of the Universidade Fedral de Viçosa, due to low academic performance, abandonement or lapse of time cannot be admitted to the same level of graduate program, for the periods of 2 (two) or 4 (four) years for master's and doctoral degrees, respectively.
§ 3 - Candidates who have been disconnected from any Graduate Program of the Universidade Federal de Viçosa due to disciplinary reasons cannot be admitted to the Graduate Program.
§ 4 - The Registrar's Office is in charge of ensuring compliance with the restrictions set out in paragraphs 2 and 3, by means of their records of students disconnected from graduate programs of the Universidade Federal de Viçosa.
22 – A Master's degree will be required for admission in the doctoral program.
§ - Sole paragraph - On a reasoned proposal by the Coordinating Committee, the Council of Graduate Studies may waive this requirement.

Art. 23 – Candidates must present the following documents for application:
a) Enrollment form (two copies);
b) a certified copy of the certificate or statement of completion of undergraduate degree (for doctoral program, the certificate of conclusion of the master's degree program is also required);
c) a certified copy of the academic transcript of the undergraduate program explaining the evaluation system (the academic transcript of the master's degree program is also required for doctoral degree);
d) Curriculum vitae, one copy (with proof);
e) One 3 x 4 photograph;
f) Copy of Certificate of Birth or Marriage;
g) Copy of the ID card;
h) Copy of the proof of military service; (Brazilian citizens)
i) Copy of Voter Registration; (Brazilian citizens)
j) Copy of the CPF;
k) three letters of reference, at the discretion of the Program; and
l) proof of payment of enrollment fee, which shall be stipulated by the Universidade Federal de Viçosa.
§ - Sole paragraph - If applicants have only the certificate of course completion, upon enrollment, they will be obliged to present certified copy of their diploma to the Registrar's Office.

Art. 24 - The date of submission of application for enrollment shall be divulged in the Academic Calendar of the Universidade Federal de Viçosa.
Art. 25 - Besides the analysis of the documents required in the application process, the Coordinating Committees may adopt other criteria they deem appropriate for the selection of candidates.
Art. 26 - The selection will be valid only for enrollment in the school year for which it was approved or the subsequent period, after consultation with the Program Coordination.
27 - The coordinators will inform the candidates of the result of the selection.

CHAPTER VI

ENROLLMENT
Art. 28 - Every semester, on the date fixed by the School Calendar, all students must apply for renewal of enrollment.

...

Art. 30 - Failure to renew enrollment in due season will mean abandonment of the Program and automatic disconnection, if, on the date specified in the academic calendar, students do not require from the School Board of Enrollment a special leave, which will be valid for the respective semester and granted one (1) time.

Art. 31 - When authorized to conduct activities outside the institution, students are dismissed from enrollment renewal while their period of leave lasts.

Art. 32 - Students may request cancellation of enrollment in one or more disciplines, if their advisors agree.
§ - Cancellation of enrollment will only be granted once for each discipline.

...

CHAPTER VII

TEACHING REGIME
Art. 34 - Regular teaching will be organized in the form of courses, with lectures, seminars, directed studies, practical classes and other teaching methods.
§ Sole paragraph - The disciplines will be classified into three levels, codes 600, 700 and 800, according to the content and focus of their respective analytical programs (syllabus).

Art. 35 - Seminars, Special Problems, Special Topics, Research and Internship in Teaching will be encoded as 700-level disciplines.
§ - Sole paragraph- Seminars should be specific to each program.

Art. 36 – Credit is the basic unit for assessing the intensity and duration of disciplines. 1 (one) credit is equivalent to fifteen (15) hours of lecture or thirty (30) hours of practical classes.

Art. 37 – Academic performance examination will be carried out through practical work, oral tests, written tests and final exam, at the discretion of professors. Specifically for the discipline Teaching Internship, performance will be evaluated by the coordinator of the discipline and the professors that tutored students in the execution of the planned activities.
Art. 38 - The system used for assessing disciplines will be concept-grade expressed by a letter, according to the following equivalence of relative performance:
CONCEPT-GRADE SYMBOLS PERFORMANCE PERCENTAGE
Excellente A from 90% to 100%
Good B From 75% to 89%
Fair C From 60% to 74%
Failure R Below 60%
Incomplete I
Cancellation of enrollment in Discipline J
Cancellation of Enrollment K
Satisfactory S
Non-Satisfactory N
Ongoing Q

§ 1 - In the disciplines Special Problems and Internship in Teaching, students may use the maximum of three (3) credits at each level to complete their study plan.

§ 2 - The Analytical Programs of Special Problems and Special Topics and a list with the names of the students approved to attend these disciplines should be forwarded to the Board of School Registration, which will create a class for each specific analytical program, in the same school term.
§ 3 – The discipline Seminar will grant, in each level, 1 (one) or 2 (two) credits, which will not be counted in the performance coefficient, but may be considered to complete the minimum credits required by the program at the discretion of the Coordinating Committee.
§ 4 - The provisional concept I (incomplete) will be attributed to students that discontinue, force majeure, part of their their academic work, and have obtained a performance proportionally sufficient for approval in the evaluations applied. Proof of the hindrances should be given to the professors of the disciplines attended. The concept I (incomplete) will be transformed into R (failure) if the works are not completed and a new concept is not assigned and sent to the Registrar's Office, before the deadline set by the School Calendar.
§ 5 - The concept J (cancellation of enrollment in discipline) refers to the effective cancellation of enrollment.
§ 6 - The concept K (suspension of enrollment) refers to the effective suspension of enrollment.
Article 39 - The requirements that do not give credit or are not counted in the credits provided for in Art. 83 or Art. 84 of this regiment will be evaluated by the following concepts:
Q - Ongoing;
S - Satisfactory; and
N - Non-Satisfactory.

Art. 40 - At the end of each term, the performance coefficient is calculated, based on the sum of the number of credits in each discipline, which will be multiplied by 3, 2, 1 and 0, assigned to the concepts A, B, C and R, respectively, and divided by the total number of credits of the respective disciplines.
§ 1 - To calculate the accumulated performance coefficient, the value will be represented with a decimal point, which will be rounded to the next higher figure if the second decimal point is greater than or equal to 5 (five).
§ 2 - The performance coefficient is achieved by dividing the sum of the points obtained by the sum of credits of the disciplines taken in each term, which have received concepts A, B, C or R.
§ 3 - The accumulated performance coefficient is obtained for all terms students were enrolled.
Art. 41 – Students that obtain concept R in a discipline should attend it again. The last concept obtained should be the final result, with the exception of the disciplines Special Problems and Special Topics.
Art. 42 - The disciplines whose concepts are R, I, J or K shall not be used in the counting of the credits required in the program.
Art. 43 - The title will only be awarded to students who met the other requirements and were approved in all disciplines listed in their academic transcript, excepting the disciplines Special Problems and Special Topics.

Art. 44 - For all purposes under this Statute, students that do not achieve frequency of at least 75% in the teaching activities scheduled will fail.
Art. 45 - Students that fall into one or more of the conditions specified below will be disconnected from the program, except if they are enrolled in disciplines which are not included in the calculation of the performance coefficient:
a) obtaining, in their first term, performance coefficient below 1.3 (one and three tenths);
b) obtaining, in their second term, accumulated performance less than 1.7 (one and seven tenths);
c) obtaining, in their second term, accumulated performance coefficient less than 2.0 (two), having completed the minimum number of credits required by the program;
d) obtaining, in their third term and in the subsequent terms, an accumulated performance coefficient of less than 2.0 (two);
e) obtaining grade R (failure) in any discipline for the second time, either in undergraduate or graduate program, except in the case of specific disciplines, to meet the requirements of foreign language;
f) obtaining two concept-grades N (Non-Satisfactory), either consecutive or not, in Research; and
g) failing to complete all requirements of the program within the prescribed period.
§ - Sole paragraph - The concept "R" will be counted in the calculation of the performance coefficient, while another concept is not attributed to the discipline taken twice.

CHAPTER VIII

ADVICE TO STUDENTS

Art. 46 - The didactic orientation to students will be exercised by advisors or, alternatively, by co-advisors.
§ - Sole paragraph - Advisors will be appointed by the Coordinating Committee, subject to the provisions of the Internal Statute of the program.
Art. 47 - Research for writing dissertation or thesis will be supervised individually by an advisor or, optionally, by an Advisory Committee formed by an advisor and co-advisor(s).
Art. 48 – Advisors are specifically in charge of:
a) organizing students' study plan;
b) proposing the names of co-advisors who will take part in the Advisory Committee;
c) conducting research, object of the dissertation or thesis of students, and assigning the concept obtained in assessments;
d) promoting regular meetings with the participation of students and the Advisory Committee;
e) approving the application for renewal of enrollment as well as requests for replacement, cancellation and enrollment for disciplines and suspension of enrollment;
f) assisting students in issues related to current academic standards and processes;
g) chairing the Board of Defense of Dissertation or Thesis or the Board of the Qualification Examination.

Art. 49 - The average number of students under orientation of a professor cannot exceed (6), for each Graduate Program.

CHAPTER IX

STUDY PLAN

Art. 50 - The Study Plan will necessarily contain the courses of the area of concentration and related field, as well as seminars, foreign language and area of research for the dissertation or thesis.

§ 1 - The courses attended out of the Universidade Federal de Viçosa will be classified as belonging to the area of concentration, related field or out of the program, at the discretion of the Coordinating Committee of the Program.

§ 2 - Enrollment in the course “Internship in Teaching” can only be made by students enrolled in the Graduate Program of the Universidade Federal de Viçosa, subject to availability of vacancy, to be defined by the respective department, and consent from students’ advisors and the coordinator of the discipline

Art. 51 - After being approved by advisors and students, the Study Plan will be analyzed by the Coordinator of the Program and the Chairman of the Council of Graduate Studies, by the end of the first term attended by students at the University.

§ 1 – Without an approved Study Plan, students cannot be enrolled in the second term.

§ 2 - The Study Plan may be changed by suggestion from advisors.

...

CHAPTER X

FOREIGN LANGUAGE REQUIREMENT

Art. 53 - Students will have three alternatives to meet the foreign language requirement:

a) approval in a foreign language proficiency examination applied by the Department of Languages or the Coordination of Graduate Program;

b) approval in disciplines recognized by the Technical Board of Graduate Studies as sufficient; and

c) approval in standardized foreign language examinations.

Art. 54 - The proficiency examinations, prepared by the Department of Languages, will be applied on dates mutually agreed with the School Calendar.

Art. 55 - The concept "N" obtained in a foreign language discipline will be automatically replaced by the concept "S" when students are successful in a foreign language proficiency examination.

CHAPTER XI

USE OF CREDITS

Art. 56 - credits of course taken at the Universidade Federal de Viçosa may be used, provided that they are consistent with the content of the program in which students are enrolled.

§ - Sole paragraph - Credits obtained in disciplines specific to the *Lato Sensu* program cannot be used.

...

CHAPTER XII

TRANSFER OF CREDITS OBTAINED OUTSIDE THE UFV

Art. 62 - The Universidade Federal de Viçosa may accept the transfer of credits obtained at other education institutions, for disciplines consistent with the Program to which students are bound, up to 50% (fifty percent) of the number required in Art. 83 or 84 of this Statute.

§ 1 - Only disciplines with concept A and B can be transferred.

§ 2 - Credits obtained in disciplines specific to Lato Sensu Programs cannot be transferred.

§ 3 - Credits obtained in disciplines taken at double level condition, as undergraduate students, cannot be transferred.

...

Art. 65 – Credit transfer must be recommended by the Coordinating Committee of the Program and approved by the Council of Graduate Studies.

CHAPTER XIII

QUALIFYING EXAM

Art. 67 - Every candidate for the title of *Doctor Scientiae* should undergo a qualifying examination.

§ - The qualifying examination aims to assess whether students have the scientific and cultural training expected for a contender for the title of *Doctor Scientiae*.

Art. 68 - Only students who have obtained all credits demanded in their study plan can take the qualifying examination.

...

Art. 70 - The Examination Board shall be composed of five (5) members who hold Doctoral degree.

Sole Paragraph - The Board shall have five (5) full members and two (2) alternates.

Art. 72 - The qualifying examination will consist of two stages, one written and another oral, and will address areas of knowledge relevant to students' training.

Art. 73 – Students who obtain the unanimous positive indication from the members of the Examining Board shall be considered approved.

74 - The test results should be reported to the Dean of Research and Graduate Studies, in proper form, within ten (10) days after its completion.

Art. 75 – Students who failed the qualifying examination will be given another chance, after a maximum of six (6) months from the date of realization.

CHAPTER XIV

THE RESEARCH PROJECT

Art. 76 - Every graduate student should prepare a compulsory research project for the development of their dissertation or thesis.

Art. 77 - The research project shall be prepared under the supervision of the Advisory Committee, approved by the head of the department and the director of the Center for Sciences and registered in the office of the Dean of Research and Graduate Studies.
Art. 78 - The research projects of students applying for the title of *Magister Scientiae* or *Doctor Scientiae* will be delivered mandatorily for registration in the office of the Dean of Research and Graduate studies up to the last day of the disclosure of the concepts for the third and fifth terms, established in the School Calendar, respectively.
§ 1 - All students applying to the titles of *Magister Scientiae* or *Doctor Scientiae* will be required to enroll in the discipline Research, after the payment of due fees, in the second and fourth renewal of enrollment, respectively.
§ 2 – If students fail to meet the deadlines established in the caput of this article, they will be given concept 'N' in Research.

CHAPTER XV

DISSERTATION OR THESIS

Art. 79 - All graduate students who are candidates for the title of *Magister Scientiae* or *Doctor Scientiae* shall prepare and defend a dissertation or thesis, respectively, and be approved in it.
§ 1 - The dissertation or thesis may be written in English, Portuguese or Spanish, at the discretion of the Advisory Committee.
§ 2 – Candidates, the Advisory Committee and the Examining Board are in charge of the formatting, language and content of the dissertation or thesis.
§ 3 - The dissertation or thesis, under the supervision of the Advisory Committee, should be based on original research work that really contributes to scientific knowledge on the subject.
§ 4 - The results of the research carried out for obtaining the Master's degree or Doctoral degree are subject to current laws, rules or resolutions related to intellectual property of the Universidade Federal de Viçosa.
Art. 80 - The dissertation or thesis will be defended before a board formed by holders of doctoral degree, under the chairmanship of the respective advisors.
§ 1 - The dissertation board will include at least 3 (three) full members and 2 (two) alternates.
§ 2 - The Board of thesis will be appointed with at least five (5) members and two (2) alternates.
§ 3 - The members of the Board, proposed by the Advisory Committee and indicated by the Coordinator of the Program, will be appointed by the President of the Technical Board of Graduate Studies.
§ 4 – At least 1 (one) of the full members of the dissertation board should not belong to the Program or to students' Advisory Committee.
§ 5 – At least 1 (one) of the full members of the thesis board should not belong to the Program and 1 (one) member should not belong to the Universidade Federal de Viçosa, and none of these two should belong to the Advisory Committee of the respective student.

§ 6 – After the desgination of the board of thesis or dissertation defense, a minimum period of 10 (ten) days shall be observed for the defense. Advisors should set the date, time and place of the defense and inform the members of the board and students.
§ 7 - The defense of the dissertation or thesis should also include assessment of the knowledge acquired by the applicant during the development of the program.
§ 8 - Candidates receiving the unanimous indication from the members of the board will be approved.
§ 9 – Candidates disapproved can be submitted to another defense, at the discretion of the Examining Board.
§ 10 - The result of the defense should be reported to the Dean of Research and Graduate Studies, in proper form, within 10 (ten) days after its completion.
§ 11 – If advisors are unable to attend, by force majeure, the Coordinating Committee of the Program will indicate one of the members of the Examining Board to preside, as alternate, with knowledge of advisors.
...

CHAPTER XVI

ACADEMIC TITLE
Art. 83 - The title of *Magister Scientiae* will be granted to students that:
a) complete at least 24 (twenty-four) credits in disciplines of the Graduate Program to which they are bound, in accordance with the provisions of this Statute, with an accumulated performance coefficient equal to or higher than 2 (two);
b) meet the foreign language requirements;
c) meet the requirements of the discipline Seminar; and
d) submit the text of their duly approved dissertation and copies of its final version to the Dean of Research and Graduate Studies.

Art. 84 - The title of *Doctor Scientiae* will be granted to students that:
a) complete at least 24 (twenty-four) credits, if they have a title of *Master's* or *Magister Scientiae*, or 48 (forty-eight) credits, if they have only a bachelor's degree in disciplines of the Graduate Program to which they are bound, according to the provisions of this Statute, with accumulated performance coefficients equal to or higher than 2 (two);
b) meet the foreign language requirements;
c) meet the requirements of the discipline Seminar; and
d) submit the text of the duly approvd thesis and copies of its final version to the Dean of Research and Graduate Studies.
Art. 85 - The Technical Board of Graduate Studies or the Coordinating Commission may establish other requirements for the Program, besides those already specified.

CHAPTER XVII

THE ISSUANCE OF A CERTIFICATE OF SPECIALIZATION FOR MASTER'S DEGREE STUDENTS

...

CHAPTER XVIII
CO-TUTELAGE AND GRADUATE DUAL PROGRAMS IN PARTNERSHIP WITH FOREIGN INSTITUTIONS OF HIGHER EDUCATION

Art. 90 - Co-tutelage is understood as academic cooperation in *stricto sensu* graduate studies agreed between the UFV and foreign institutions, in which students in training receive shared guidance of faculty members of the institutions involved.
§ 1 Definitions: a) dual/joint title - two or more degrees conferred by two or more institutions for the same study program developed separately and implemented in each of the participating institutions; b) joint degree - degree jointly awarded by institutions or degree conferred by each institution participating of a program developed and recognized by the institutions concerned.
§ 2 For each thesis and/or dissertation developed in co-tutelage, a specific agreement should be signed between UFV and the foreign institution. This agreement must be approved by the Technical Board of Graduate Studies.
§ 3 - The agreement for co-tutelage will be signed between the higher courts of the institutions, with agreement of the coordinators of the graduate programs involved.
§ 4 - International graduate dual programs, in association with foreign institutions recognized by CAPES, are considered as co-tutelage.
Art. 91 - Students developing thesis and/or dissertation under co-tutelage agreement will graduate from the partner institutions.
§ 1 - The board of examiners of the defense of thesis/dissertation must have at least one representative from each institution.
§ 2 – The session for defense of thesis/dissertation will not require the presence of the assessors and students in the same location. Technological resources can be used to communicate in real time.
§ 3 - Theses/dissertations can be written and defended in the languages mentioned in Art. 79, § 10, as defined in the agreement of co-tutelage.

Art. 92 – The protection of the theme of the thesis/dissertation, as well as publication, exploitation and protection of research results which are common to both institutions should be ensured in accordance with the provisions of the cooperation agreement signed between the parties and specific legislation of each country involved in the co-tutelage agreement.

Art. 93 - Applicants must comply with all requirements of the agreement between the institutions to obtain the title in co-tutelage.

CHAPTER XIX
OFFSHORE GRADUATE STUDIES
Article 94 - The UFV will offer graduate programs abroad to other institutions through agreements. The degree conferred to these programs, either master's or doctoral degree, will be in offshore degree mode.
§ 1 - The offshore degree mode will be held in co-tutelage. In this case, the provisions of Chapter XVIII are applied.

TITLE III

NON-BOUND STUDENTS

Art. 95 - The Universidade Federal de Viçosa may accept non-bound students who are interested in improving their knowledge without pursuing, however, a graduate title.

Art. 96 - Applicants must submit the following documents upon enrollment:
a) due enrollment form (two copies);
b) a certified copy of the diploma or statement of completion of undergraduate degree;
c) a certified copy of the academic transcript of the undergraduate program, declaring the evaluation system adopted;
d) a 3 x 4 photo;
e) Copy of Birth or Marriage Certificate;
f) copy of Identification Card;
g) copy of proof of Military Service;
h) copy of Voter Registration Card; and
i) copy of CPF.
§ - Candidates must specify the disciplines they want to attend, in the application form.
Art. 97 - The application period will close thirty (30) days prior to the offer of the discipline (s) and must be approved by the coordinator of each discipline and the head of each department that offers these disciplines.
§ 1 - The application shall be made in each department that offer disciplines and shall meet the criteria established above.
§ 2 - Non-bound students may enroll in up to 3 (three) disciplines per regular term, in the maximum of two (2) terms.
Art. 98 - Admission of non-bound students will be valid for one semester.
§ 1 - The enrollment fee will correspond to the value of the enrollment of students who are starting the Graduate Program, according to the rates set by the Universidade Federal de Viçosa.
§ 2 - The granting of new enrollment as non-bound student will be conditional on the approval in discipline (s) previously attended
Art. 99 - Non-bound students may request cancellation of enrollment in disciplines, respecting the dates specified in the academic calendar.

TITLE IV

STUDENTS ENROLLED IN OTHER INSTITUTIONS (BOUND STUDENTS)

Art. 100 - The Universidade Federal de Viçosa may accept graduate students regularly enrolled in stricto sensu Graduate Programs from other Higher Education Institutions who wish to take disciplines of the UFV stricto sensu Graduate Programs.
Art. 101 - Upon enrollment, applicants must submit to the Dean of Research and Graduate Studies the following documents:
a) certified copy of the academic transcript of the Graduate Program in which they are enrolled;
b) request for enrolling in the discipline (s) they wish to attend;
c) request from the institution they are bound to.

Art. 102 - The period for application will terminate thirty (30) days before the start of the classes of the discipline(s) required. The application for enrollment must be analyzed and approved by the Coordination of the respective Graduate Program of the Universidade Federal de Viçosa and by the coordinator of each discipline and the head of each department that offers these disciplines.
§ - Sole paragraph - Bound students may attend a maximum of twelve (12) credits.
Art. 103 - Admission of bound students will be valid for one semester.

§ 1 - The enrollment fee will be equivalent to the rate for renewal of enrollment in Graduate Programs, as established by the Universidade Federal de Viçosa.
§ 2 - The granting of new enrollment as bound student will be conditioned to approval (s) in the discipline (s) previously taken.
Art. 104 - Bound students may request cancellation of enrollment in one or more disciplines, within the dates specified in the academic calendar.

...

TITLE VI
ACCREDITATION OF PROFESSORS AND RESEARCHERS

Art. 107 – UFV higher education professors holding a doctorate degree will be accredited for the exercise of graduate activities.
§ Sole paragraph – graduate activities are understood as teaching, research, co-advising and advising.
Art. 108 – The exercise of orientation activities in a graduate program will require the accreditation of faculty members specifically for the program.
§ 1 - The criteria for accreditation of professors as advisors will be established by the respective Coordinating Committee and approved at a regular meeting of the Technical Board of Graduate Studies.
§ 2 - The Coordinating Committee, considering the criteria in § 1, indicates the accreditation of the professors that request it to the Dean of Research and Graduate Studies.
§ 3 - At intervals of no more than 5 (five) years, professors will forward to the Coordinating Commission their request for re-accreditation as advisors in the program. Based on the criteria established in § 1, the Coordinating Committee shall decide whether the professors who require re-accreditation will be re-accreditated or not by the Dean of Research and Graduate Studies.
§ 4 - If a professor is not re-accredited as advisor, he/she must complete his/her advisory work still in progress.
Art. 109 – High school teachers and technicians from the Universidade Federal de Viçosa who hold a doctoral degree may be accredited as co-advisors and advisors.
Art. 110 - The accreditation of researchers or faculty members from other institutions that hold doctoral degree should be carried to allow them to become co-advisors and advisors specifically of master's and doctorate students.

§ - The accreditation of professors/researchers outside the Universidade Federal de Viçosa will not imply employment of any nature by the University, nor entail any liability on its part.
Article 111 - The request for accreditation must be submitted in the form of process, to the Dean of Research and Graduate Studies, by the department to which the respective professor/technician belongs, after analysis by the Coordinating Commission of the Program, where the professor/technician will perform most activities. Requests from researchers or professors from other institutions will be submitted only by the Coordinating Committee of the Program.
§ - Sole Paragraph - The process should include reasoned justification, curriculum of the candidates, proof of the title achieved and authorization from their immediate boss, for researchers or professors from other institutions.

Article 112 - The chairman of the Technical Board of Graduate Studies is responsible for probating the process and authorizing the enrollment of advisor professors; and the Technical Board of Graduate Studies is responsibe for approving the accreditation of professors who do not teach in higher education programs and technicians of the Universidde Federal de Viçosa, as well as professors and technicians from other institutions.

TITLE VII

FINAL PROVISIONS
Art. 113 - The Graduate Programs at the Universidade Federal de Viçosa shall be governed by the provisions of this regiment, without prejudice to specific provisions of the Statute, General Rules of the University and other standards, Acts and Resolutions established by the competent Governing Bodies.
Art. 114 - The provisions of this regiment for Postgraduate studies may be modified by the competent authorities, where necessary, even during the school year.
Art. 115 – Contrary provisions are therefore revoked, in particular, Resolution No. 1/2006-CEPE.
Art. 116 - These Rules shall enter into force on the date of their publication.
SPECIAL SUMMER PERIOD
The Special Summer Period, which lasts for a minimum of 45 (forty-five) days, takes place in the months of January and February and offers disciplines at undergraduate and graduate levels. Enrollment is open to students admitted to regular graduate programs, non-bound students, or students enrolled in other higher education institution.
COEFFICIENT OF PERFORMANCE
1. COEFFICIENT OF PERFORMANCE (CR) is achieved by dividing the sum of the points obtained during a term by the sum of credits of the disciplines in which students are enrolled. For example:
Calculation of the Coefficient of Performance Disciplines Credits Concepts Values Points
CTP 710 4 C 1 4
CTP 600 3 B 2 6

CTP 602 3 R 0 0
CTP 634 4 C 1 4
CTP 671 3 A 3 9
Sum 17 - - 23
Coefficient of Peformance (CR) 23:17 = 1,4
2. ACCUMULATED COEFFICIENT OF PERFORMANCE is achievd by dividing the sum of all points already obtained, from the first regular period, by the sum of all credits in disciplines in which a student is effectively enrolled.
* Rules altered by Resolutions 05/2007, 03/2008, 05/2008, 03/2009, 10/2010, 09/2011 and 08/2012 of the CEPE.

APPENDIX 4

Letter from the Director (Coordinator) of Graduate Studies at UFV.

UNIVERSIDADE FEDERAL DE VIÇOSA
CENTRO DE CIÊNCIAS AGRÁRIAS
DEPARTAMENTO DE FITOPATOLOGIA

Viçosa, August 01 2014

Dear Prof. Lisa J. Vaillancourt:

I would like to inform you that the U.S. graduate students will take their tests and write their papers in English when taking the laboratory courses of Mycology, Bacteriology, Nematology and Virology regarding the Dual Degree Program to be celebrated between our Plant Pathology Program at Viçosa Federal University, Brazil, with the Plant Pathology Department at University of Kentucky.

Best Regards,

Prof. Fabrício de Ávila Rodrigues
Graduate Coordinator of the Plant Pathology
Program at Viçosa Federal University

Processo nº. 008353/2001

Termo Aditivo nº. 01 ao Convênio nº. 002/2013

ADDITIONAL TERM OF AGREEMENT

STUDENT EXCHANGE BETWEEN FEDERAL UNIVERSITY OF VIÇOSA AND UNIVERSITY OF KENTUCKY

SELECTION OF PARTICIPANTS:

The selection procedure by which reciprocal exchange candidates are nominated is the responsibility of the sending university. The candidates may be either undergraduate or graduate students. The number of students sent by each university, each year, will be up to ten, and reciprocity will be based on student credit hours.

Each institution reserves the right to require candidates to present the necessary documentation for selection and to provide the results of any required admission examinations.

Each institution reserves the right to accept or reject a candidate on the basis of regular academic selection criteria and to assign each student appropriate status at the time of admission. It is also understood that certain candidates may be rejected on account of shortage of faculty, lack of student places or other resources.

Selection of students shall be without regard to race, sex, color, religion, sexual orientation, marital status, national origin, age, or beliefs.

The acceptance of exchanges is conditional on the obtaining the necessary immigration and travel clearance. The receiving university will endeavor to assist students in obtaining the proper documents.

At least three months prior to the planned arrival of students, each university will send to the other full information on the students nominated to fill the allocated places.

TERMO ADITIVO AO CONVÊNIO

INTERCÂMBIO DE ESTUDANTES ENTRE A UNIVERSIDADE FEDERAL DE VIÇOSA E A UNIVERSIDADE DE KENTUCKY

SELEÇÃO DOS PARTICIPANTES:

O processo de seleção pelo qual os candidatos ao intercâmbio deverão passar, será de responsabilidade da instituição que está enviando. Os candidatos poderão estar cursando graduação ou pós-graduação. 0 número de alunos a ser enviado por cada universidade anualmente sera de ate dez, e a reciprocidade será com base no número de horas/créditos.

A cada instituição é reservado o direito de exigir aos candidatos documentação pertinente para a seleção, bem como os resultados obtidos nos testes de seleção,

Cada instituição tem o direito de aceitar ou rejeitar o candidato com base nos critérios normais de rendimento acadêmico, competindo-lhe atribuir ao estudante o status adequado no momento da admissão. Fica, ainda, esclarecido que alguns candidatos poderão não ser aceitos devido ao número reduzido de vagas, à falta de espaço ou de outros recursos.

A seleção de candidatos será sem distinção de raça, sexo, cor, religião, orientação sexual, estado civil, nacionalidade, idade ou crenças.

A aceitação dos candidatos estará condicionada pelas exigências relativas a vistos e autorizações de viagem de acordo com as leis de imigração. A universidade receptora deverá auxiliar os estudantes no processo de obtenção da documentação necessaria.

Pelo menos três meses antes da chegada prevista dos estudantes, cada universidade enviará à outra informações completas sobre os estudantes selecionados para completar

as vagas oferecidas.

ACADEMIC PROGRAM

The University of Kentucky will enroll accepted Federal University of Viçosa exchanges as full-time special non-degree classification students for up to two regular semesters of the academic year, this is for a period of twelve months. Federal University of Viçosa students may enroll in regular University of Kentucky courses for which they have the appropriate prior study and which are adequate to the needs of the Federal University of Viçosa curriculum.

At the end of the academic semester, the University of Kentucky will send to the Federal University of Viçosa a report on the academic achievement of the exchange students. This report will take the form of an official transcript.

The Federal University of Viçosa will enroll accepted University of Kentucky exchanges as full-time special non-degree classification students for up to two regular semesters of the academic year, this is for twelve months. The University of Kentucky students may enroll in regular Viçosa courses for which they have the appropriate prior study and which are adequate to the needs of the University of Kentucky curriculum.

At the end of the academic semester, the Federal University of Viçosa will send to the University of Kentucky a report on the academic achievement of the exchange students. This report will take the form of an official transcript.

STUDENT FINANCES

All students will pay tuition and fees to their home university.

PROGRAMA ACADEMICO

A Universidade de Kentucky irá matricular os estudantes do intercâmbio provenientes da Universidade Federal de Viçosa como estudantes em tempo integral, em caráter especial, não graduados, por até dois semestres letivos, ou seja, por urn período de doze meses. Os estudantes da Universidade Federal de Viçosa poderão matricular-se em cursos da Universidade de Kentucky, em matérias para as quais tenham os necessarios pré-requisitos e que sejam adequadas ao currículo da Universidade Federal de Viçosa.

No final do semestre acadêmico a Universidade de Kentucky enviará à Universidade Federal de Viçosa urn relatório relativo ao aproveitamento academico dos estudantes. Este relatório, terá o formato de urn histórico escolar oficial.

A Universidade Federal de Viçosa irá matricular os estudantes do intercâmbio provenientes da Universidade de Kentucky na condição de estudantes em tempo integral, em caráter especial, não graduados, por urn periodo de até dois semestres letivos, ou seja de doze meses. Os estudantes da Universidade de Kentucky poderão se matricular em cursos da Universidade Federal de Viçosa, em matérias para as quais tenham os necessarios pré-requisitos e que sejam adequadas ao currículo da Universidade de Kentucky.

No final do semestre acadêmico a Universidade Federal de Viçosa enviará à Universidade de Kentucky urn relatório relativo ao aproveitamento academico dos estudantes. Este relatório, terá o formato de urn histórico escolar oficial.

TAXAS ESCOLARES

Todos os estudantes deverão pagar as taxas estudantis devidas às suas universidades de origem.

Room and meal costs, travel, health and accident insurance, books and supplies, and incidental expenses are the responsibility of the individual exchange students, except if the receiving university determines otherwise.

Hospedagem, alimentação, seguro de saúde e de acidentes, livros e material escolar, bern como despesas não programadas são da responsabilidade do estudante, exceto, se a instituição receptora determinar 0 contrário.

The receiving institution will reserve appropriate university housing for each exchange. Arrangements for other than university housing must be negotiated on an individual basis.

A instituição receptora fará reserva de hospedagem adequada para os alunos do intercâmbio, em residencias universitárias. Outro tipo de alojamento deverá ser negociado pelo próprio estudante.

The receiving institution will provide to the students, in advance, a list of estimated living expenses. The exchanges will be entitled to the use of all host university facilities on the same basis as home students.

A instituição receptora fomecerá de antemão aos estudantes, uma estimativa de custos. Os estudantes do intercâmbio poderao utilizar todas as instalações da universidade receptora da mesma forma que os estudantes locais.

EXCEPTIONS AND AMENDMENTS

EXCEÇÕES E OUTRAS CONSIDERAÇÕES

For conditions of the exchange not covered by this memorandum of agreement or for problems which may arise during the course of the exchange agreement, both parties agree to refrain from unilateral action and to consult and negotiate mutually agreeable decisions.

Para situações do intercâmbio não previstas neste acordo, ou problemas que possam surgir quando 0 programa estiver em cu rso , ambas as partes se comprometem a evitar ações unilaterais, ease consultar e negociar decisões de comum acordo.

Amendments to the agreement may be made at any time by agreement of the parties through the exchange of documents. Such amendments shall be added in the form of appendices.

Acréscimos ao acordo poderão ser feitos a qualquer momento desde que sejam de comum acordo entre as partes e expostos em documentos escritos. Estes acréscimos deverão ser acrescidos na forma de termo aditivo.

This agreement is initially for a five-year period, renewable at the end of this period by mutual agreement.

Este acordo terá inicialmente a duração de cinco anos, podendo vir a ser renovado, de comum acordo, no final deste período.

The balance of exchanges will be reviewed annually. As a result of this review, student numbers exchanged in subsequent years will be adjusted based on an expected balance in terms of student credit hours.

O balanço do intercambio será revisto anualmente. Em resultado desta revisão, 0 número de estudantes será ajustado nos anos subsequentes de forma a garantir urn equilibrio esperado em termos de número de horas/créditos.

If the number of exchanges is not equal for both sides at the end of five years, the agreement will continue until a balance in the

Se o número de estudantes que participaram do intercâmbio não for o mesmo para ambas as partes no final de cinco anos, o acordo

number of students exchanged is reached.

University of Kentucky

Susan Carvalho
Associate Provost for International Programs

Date 01/03/13

M. Scott Smith
Dean, College of Agriculture

Date 01/03/13

John Walz
Dean, College of Engineering

Date 01/03/13

continuará até que um equilibrio em nú seja alcançado.

Universidade Federal de Viçosa

Prof. Nilda de Fatima Ferreira Soares
Reitor

Date 03/01/13

Procuradoria Federal UFV

Processo nº. 008353/2001

Convênio nº. 002/2013

ACADEMIC INTERCHANGE AGREEMENT BETWEEN UNIVERSITY OF KENTUCKY AND UNIVERSIDADE FEDERAL DE VIÇOSA

The University of Kentucky and the Federal University of Viçosa, wishing to develop cooperative relations on the basis of established contacts and mutual understandings, especially to develop academic and cultural interchange through mutual assistance in the areas of teaching and research, agree as follows:

FIRST CLAUSE

Area of Cooperation

The area of cooperation includes, subject to mutual consent and appropriate conditions, any program offered at either University and proposed by either as desirable, feasible, and contributory to the fostering and development of the cooperative relationship between the two universities.

SECOND CLAUSE

Methods

All understandings and assistance shall be subject to availability of funds and the specific approval of the President of the University of Kentucky and the President of the Federal University of Viçosa, through such activities or programs as:

1. Exchange of faculty members and

CONVENIO DE INTERCAMBIO J ACADEMICO ENTRE UNIVERSIDADE DE KENTUCKY E UNIVERSIDADE FEDERAL DE VIÇOSA

A Universidade de Kentucky e a Universidade Federal de Viçosa, no intuito de desenvolver relações de cooperação com base no estabelecimento de contatos e entendimentos mútuos, enfatizando desenvolver intercâmbio acadêmico e cultural através de cooperação mútua nas áreas de ensino e pesquisa, acordam 0 seguinte:

CLÁUSULA PRIMEIRA

Área de Cooperação

A área de cooperação inclui, sob consentimento mútuo e existência de condições apropriadas, qualquer programa oferecido e proposto por qualquer das Universidades como desejável, executável, e contribuitório ao fomento e desenvolvimento de relações de cooperação entre as duas Universidades.

CLÁUSULA SEGUNDA

Métodos

Todos os entendimentos e assistências estarão condicionados à disponibilidade de fundos e à aprovação especifica dos Reitores da Universidade de Kentucky e da Universidade Federal de Viçosa, através de atividades e programas tais como:

1. Intercâmbio de. membros do corpo

technical staff	decente e do quadro de técnicos de nível superior
2. Exchange of students	2. Intercâmbio de estudantes
3. Conduct joint research activities	3. Elaboração de atividades conjuntas de pesquisa
4. Participation in seminars and academic meetings	4. Participao em seminários e encontros acadêmicos
5. Special short-term academic programs	5. Programas académicos especiais de curta duração
6. Cultural exchange activities	6. Atividades de intercâmbio cultural
7. Joint participation in international training courses	7. Participação conjunta em cursos internacionais de treinamento
8. Provide for undergraduate training with coursework at the University of Kentucky and the Federal University of Viçosa	8. Proporcionar treinamento em nível de graduação com cursos realizados na Universidade de Kentucky e na Universidade Federal de Viçosa
9. Provide opportunities for staff development for both universities and other personnel development programs	9. Proporcionar oportunidades para desenvolvimento do quadro funcional de ambas Universidades e de outros programas de aprimoramento de pessoal
10. Engage in consultancies	10. Exercer consultorias
11. Other activities as deemed mutually appropriate.	11. Outras atividades julgadas mutuamente apropriadas.
The terms of such mutual assistance and necessary budget for each program and activity shall be mutually discussed and agreed upon in writing by both parties prior to the initiation of the particular activity or program. Each University will designate a Liaison Officer to develop specific activities or programs for the approval of the respective presidents.	Os termos de tal assistência mútua e o orçamento necessário para cada programa e atividade devem ser mutua mente discutidos e postos em acordo escrito por ambas as partes antes do início de atividades ou programas particulares. Cada Universidade designará um coordenador responsável para desenvolver atividades específicas ou programas para aprovação dos respectivos reitores.
THIRD CLAUSE	**CLÁUSULA TERCEIRA**

Effective Date & Length of Agreement

This agreement will remain in force for a period of five years subject to the availability of funds, and any amendment and/or modification of this agreement requires a written approval of the President of the University of Kentucky and that of the President of the Federal University of Viçosa appended hereto. After the initial five-year period, this agreement may be renewed by mutual consent.

Either party reserves the right to terminate this agreement upon six (6) months written notice to the other. Any individual activities to be continued will be specifically identified and provided for at the time of termination.

Nothing contained herein or in the activities conducted hereunder shall constitute either party the agent, servant or employee of the other party. Each party shall be fully and solely responsible for its own actions and obligations.

This agreement shall take effect on the date indicated below and IN WITNESS HEREOF, the parties hereto have offered their signatures:

Eli Capilouto
President

Date 01/03/2013

Data de Início e Duração do Convênio

Este convênio será valido por cinco anos, mediante a disponibilidade de recursos, e qualquer emenda e, ou, modificação do acordo requer aprovação escrita do Reitor da Universidade Kentucky e do Reitor da Universidade de Viçosa e deve ser anexada a este documento. Terminado o periodo inicial de cinco anos, 0 convênio pode ser renovado sob consentimento mútuo.

As partes reservam-se o direito de denunciar o convênio sob comunição escrita com seis (6) meses de antecedência. Quando do término do convênio, a prorrogação de qualquer atividade individual será identificada e providenciada.

O conteúdo deste documento ou as atividades conduzidas sob o mesmo não devem constituir qualquer das partes em agente, servidor ou empregado da outra parte. Cada parte deve ser total e unicamente responsável por suas próprias ações e obrigações.

Este convênio entrará em vigor na data abaixo discriminada, e EM TESTEMUNHO
DA VERDADE, as partes o consignam:

Prof. Nilda de Fatima Ferreira Soares
Reitor

Data 03/01/2013

Examined for Form & Legality
Office of Legal Counsel
University of Kentucky
By: _____
Attorney at Law

Procuradoria Federal
UFV