



**College of Agricultural &
Environmental Sciences**
UNIVERSITY OF GEORGIA

Master of Plant Protection and Pest Management (MPPPM)

HANDBOOK



Fall 2020

TABLE OF CONTENTS

Page

ADMINISTRATIVE INFORMATION

1	MPPPM COORDINATOR AND COMMITTEE	1
2	INTRODUCTION	2
	<i>History of the Program</i>	2
	<i>UGA Double Dawg dual degree program</i>	3
	<i>MPPPM Requirements</i>	3
	<i>Admission</i>	3
	<i>Locations of the Program</i>	5
	<i>General information</i>	6

ACADEMIC INFORMATION

1	ADVISORY COMMITTEE	7
	<i>Flow Chart</i>	7
2	PROGRAM OF STUDY	8
	<i>Area Coursework Requirements</i>	9
	<i>Possible Courses by Semester for Area II and III</i>	10
	<i>Program of Study Worksheet</i>	11
3	INTERNSHIP	12
	<i>Examples of Project Abstracts</i>	13
	<i>Internship Report Approval Form</i>	16
5	EXIT EXAMINATION	17
	<i>Exit Exam Approval Form</i>	18








GENERAL STUDENT INFORMATION

1	ASSISTANTSHIP AND TUITION WAIVERS	19
2	ONLINE ACCESS TO CLASSES	21
3	CAREER DEVELOPMENT	21
	<i>Example Resume</i>	22
	<i>Career Possibilities [Contacts]</i>	23

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Introduction

The Master of Plant Protection and Pest Management (MPPPM) is a non-thesis professional Master's degree program coordinated between the departments of Entomology, Crop and Soil Sciences, and Plant Pathology in the College of Agriculture and Environmental Sciences at the University of Georgia. The program is designed to produce graduates with comprehensive, multidisciplinary training in Integrated Pest Management (IPM) of insect, plant disease, and weed pests of agricultural and horticultural crops. MPPPM graduates are trained for employment as IPM professionals in the pest control industry, pesticide and fertilizer services, cooperative extension, and regulatory agencies. The goal of the MPPPM program is to train students to be proficient in solving the types of pest management problems routinely encountered by growers and other agricultural professionals, as well as urban pest control. IPM using a blend of pest control strategies including pesticides, transgenic crops, cultural operations, and biological control is stressed in coursework. The MPPPM program is not a research-oriented degree, but graduates have successfully pursued Ph.D. degrees related to IPM. There is no thesis requirement in MPPPM, but an IPM-oriented internship is part of the program of study. Although students pursuing the MPPPM degree can be located on the Athens, Griffin or Tifton campuses, the MPPPM program is not an online degree program. Most courses will require a physical on-campus presence for lectures and laboratory sections.

History

The Master of Plant Protection and Pest Management (MPPPM) has a long history at the University of Georgia. It was initiated in 1973 by Dr. Floyd Hendrix in the Department of Plant Pathology. MPPPM was the first professional degree program in IPM in the USA and still is one of less than five similar curricula in the USA. The first MPPPM graduate coordinator was Dr. Wiley Garrett in the Department of Plant Pathology who served in this position from 1973 to 1992. The first graduating MPPPM student, who was advised by John All from the Department of Entomology, was Glenn Hammes who went on to have a full, exemplary career at DuPont Crop Protection. Dr. John All took over the coordinator position in 1992 and served until his retirement in 2008. Up until this time, the MPPPM program was primarily based at the UGA Athens campus.

In 2008, Dr. David Langston, Plant Pathology Extension Specialist on the Tifton Campus took over as coordinator and served until 2014. Dr. David Riley in the Department of Entomology at the Tifton Campus was the coordinator from 2014 to 2019. Through Drs. Langston and Riley's leadership, the MPPPM program grew with steadily increasing number of students, especially on the Tifton campus. In 2018, the MPPPM program was expanded to students at the UGA Griffin Campus. The program is coordinated by a nine-member Coordinating Committee consisting of

faculty from each location (Athens, Griffin, Tifton) and each department (Entomology, Crop and Soil Sciences, and Plant Pathology). In 2019, Dr. Jean Williams-Woodward in the Department of Plant Pathology and located in Athens became the Program Coordinator.

The MPPPM program is also part of the **UGA Double Dawgs dual degree (4 +1) program**.

This program allows students to integrate a 4-year Bachelor's degree with a 1-year Master's degree. Undergraduate students pursuing a Bachelor of Science degree in Horticulture (<http://doubledawgs.uga.edu/ProgramDetails/13481>), Agriscience and Environmental Systems (AES) (<http://doubledawgs.uga.edu/ProgramDetails/11598>), or Environmental Resource Science (ERS) (<http://doubledawgs.uga.edu/ProgramDetails/11046>) can apply to the Double Dawg program to also pursue their Masters in Plant Protection and Pest Management (MPPPM). Coursework toward the Masters begins in the undergraduate junior year. It is highly advised that if a dual degree is desired that students reach out to the MPPPM Graduate Coordinator or the Academic Program Coordinator (contact info on page 1) to ensure a smooth transition into the Double Dawg program.

The resources that support the MPPPM program also support graduate programs in the Masters of Science and Ph.D. programs in Crop and Soil Sciences (CRSS), Plant Pathology (PATH), and Entomology (ENTO). The MPPPM program is truly multidisciplinary, functioning across the Crop and Soil Science, Entomology, and Plant Pathology departments. MPPPM affords its students exactly the type of information needed to successfully advise growers on the management of pest problems.

MPPPM Program Requirements:

MPPPM graduate students are required to complete 33 graduate credit hours (see page 9) with at least a 3.0 GPA. Students must also complete an internship in some area of IPM and write an internship report prior to their last semester of attendance (see page 12). Students must also successfully pass three subject area Exit Exams. The exams are administered by each department (Crop and Soil Science, Entomology, and Plant Pathology). Exams are scheduled after the internship report has been accepted and approved by the MPPPM Coordinating Committee.

Admission

In order to begin the admission process, you must go to the UGA Graduate School website at <http://grad.uga.edu/> and look under the "Future Students" tab. Follow the instructions for your particular category, e.g., "Domestic application information".



Graduate School UNIVERSITY OF GEORGIA

Persons seeking admission to the UGA Graduate School must hold a baccalaureate degree from an institution accredited by the appropriate regional accrediting association or its international equivalent prior to the expected semester of matriculation with the exception of University of Georgia undergraduate students enrolled in linked bachelors/masters programs. Applicants should be ranked in the upper half of their undergraduate class. Applicants are responsible for submitting application materials required for admission. These items include, but are not limited to, the following:

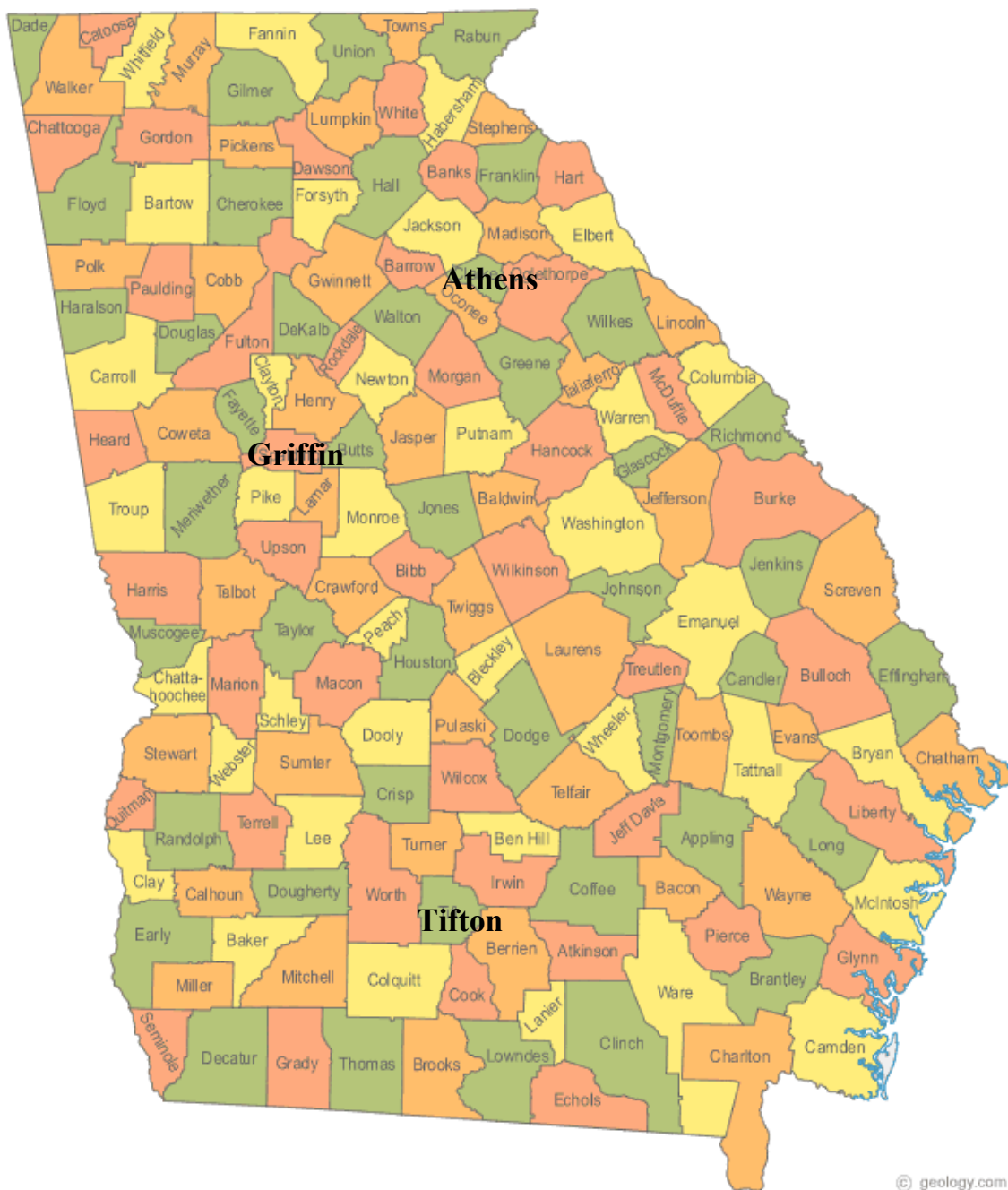
- Application for admission
- Application-processing fee
- Transcripts
- Entrance test scores
- Letters of recommendation
- Certification of finances forms (international applicants)
- Any supplemental material required by the department

Application materials are reviewed by the Graduate School and the academic departments. The Graduate School reviews the recommendation of the multi-departmental MPPPM Coordinating Committee and makes the final determination on acceptance. Applicants must be admitted to the Graduate School before they are eligible to register. Official acceptance is conveyed to the applicant in a formal letter issued by the Office of Graduate Admissions. Admission is granted for a specific semester and is validated by registration for that semester.

Specific requirements to be admitted to the MPPPM program are: 1) applicants must have an undergraduate degree from an accredited institution; 2) a minimum verbal + quantitative combined GRE score of 289 in the new grading scale or approximately not in the bottom 20th percentile; 3) a 3.0 grade point average (out of 4.0); and 4) three letters of reference. Two undergraduate chemistry courses, two biology courses and one plant pathology course are required. Any deviation from these minimum requirements, e.g. allowing for slightly lower than minimum GRE or GPA scores, must be approved by vote of the MPPPM Coordinating Committee. If students are deficient in required coursework, it is highly recommended to correct the deficiency prior to applying to the MPPPM program. Students must also include a personal statement concerning the area of pest management that you are most interested. Each student will have a home department (Crop and Soil Sciences, Entomology, or Plant Pathology) designated at the time of admittance or assignment of the internship home department. If a student does not meet the minimum requirements for admission, it is highly recommended to address the deficiency and how/why you believe you can succeed in the MPPPM graduate program.

Locations of the Program

MPPPM programs are active at UGA's Athens, Griffin and Tifton campuses.



MPPPM Internships can be conducted at any of the three campuses or at any of the Georgia Cooperative Extension Service county offices or at any of the state or federal research stations, e.g. Midville in Burke County or USDA's Byron lab and the Bacon County Blueberry Research Farm, or other cooperating institutions as approved by the MPPPM Coordinating Committee.

General Information

Websites: UGA www.uga.edu, CAES www.caes.uga.edu, CRSS www.cropsoil.uga.edu, ENTO www.ent.uga.edu, PATH <http://plantpath.caes.uga.edu/>, MPPPM <https://ent.uga.edu/graduate/programs-of-study/mpppm.html>

Electronic Facilities: Note that each UGA student is required to obtain a UGA MyID to access all of the University's electronic database systems, including UGA email, Athena, eLC, Parking Services, Student Accounts, and more. Information on UGA MyID is at https://eits.uga.edu/access_and_security/myid/. For UGA Portal to access UGA Mail, Athena, and more see <http://www.my.uga.edu>.

Also note that each UGA student receives an UGAMail account upon the creation of your UGA MyID, and it is your username @uga.edu. All official communications from the University, including important emails from the UGA Graduate School, will be sent to your UGA email address, so be sure to check this mail account frequently. You may either log directly into the mail system, or you may forward your UGA email to another personal account of your choosing. Finally, internet is available either by Ethernet cable in your assigned workspace, or via wireless access using PAWS on the three campuses.

Physical Facilities: Students may obtain keys needed for office and laboratory access from their home departmental office (CRSS, ENTO, PATH). Classroom, office and cabinet keys may be checked out from the facilities office with departmental approval. Please see that classroom and lab doors are locked, and the lights turned off, when you are the last one to leave. If you must have building access afterhours and on the weekends or holidays, see the departmental secretary in your home department at you campus location. Your major professor will typically assign desk space.

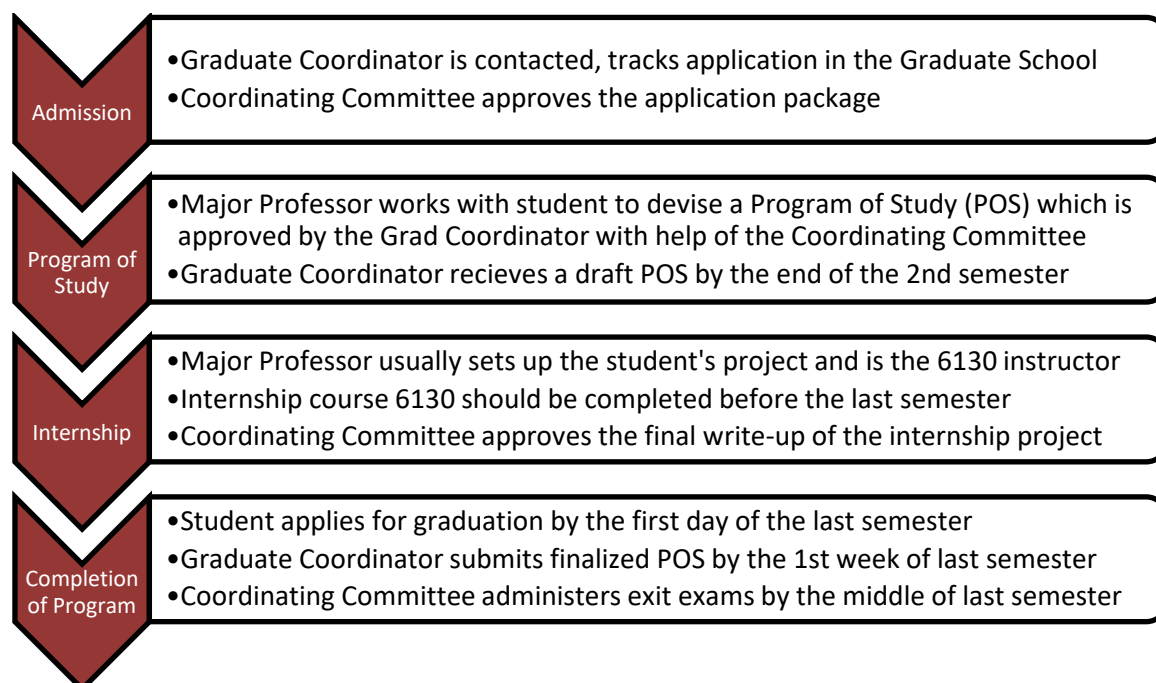
Use of state-owned vehicles must be closely monitored to ensure compliance with state laws and prevention of criticism of the University. State-owned vehicles may not be driven to and from a University employee's residence nor may they be parked overnight at an employee's residence. They may not be used for personal errands, i.e., grocery shopping, laundry, moving, etc. Families, friends, and other unauthorized persons are not permitted to ride in state-owned vehicles. Only persons with a valid driver's license, who are 18 of age and on the UGA payroll, will be permitted to operate a University vehicle. Only UGA employees are fully covered by insurance. The Georgia state law requires the use of seat belts. Drivers fined for speeding or convicted of driving under the influence of alcohol or other drugs may have the use of State vehicles withdrawn.

Academic Information for the MPPPM Degree

Coordinating Committee

The MPPPM is a professional, non-thesis degree, and, as such, does not require the typical graduate faculty committee of multiple professors to oversee a full research program. Instead, it only requires a single Major Professor who must have the highest degree in his/her profession, e.g. PhD, and be a faculty member of one of the three participating University of Georgia Departments, i.e., Crop & Soil Sciences (CRSS), Entomology (ENTO) or Plant Pathology (PATH). The Graduate Coordinator, who is a member of the UGA Graduate Faculty, and this Major Professor are the two faculty members that approve and sign off on the Program of Study Form (see page 9). However, in addition to the major professor, the MPPPM Coordinating Committee serves as an information resource for the student, votes on all graduate student admissions to the MPPPM program, votes on the acceptability of all internships (this is in addition to the assignment of a passing grade by the Major Professor of the internship course CRSS/ENTO/PATH 6130), and administers the exit exam for each department.

Any member of the Coordinating Committee (and the Coordinator) can, and often does, serve as the Major Professor. The only requirement for the Major Professor is that he/she have academic credentials that conform to Graduate School requirements for faculty advisors. The major advisor and student will develop a program of study and internship. Again, remember that the internship report by the student must be routed through the Graduate Coordinator so that he/she can seek approval of the internship by the MPPPM Coordinating Committee prior to taking the three departmental comprehensive exit exams.



PROGRAM OF STUDY

Following notification of acceptance into the MPPPM program by the Graduate School, the applicant needs to contact the MPPPM graduate coordinator, Jean Williams-Woodward (jwoodwar@uga.edu), for initial advisement and assignment of a major advisor. The first task that the student must do is select coursework toward completion of the MPPPM degree, hence the need for immediate advisement when accepted. The sum total of the coursework that the MPPPM student will take is called the Program of Study. This Program of Study must include the MPPPM core curriculum before it can be approved by the MPPPM Graduate Coordinator and the Graduate School, so it is vital that the student be advised when completing the Program of Study Form. Students are responsible for completing and submitting their Program of Study online at <https://gradstatus.uga.edu/Forms/G138>. The online form will then be routed to the Major Advisor and the MPPPM Graduate Coordinator for approval. It is recommended that the Program of Study be completed prior to the start of the second semester to ensure selected courses meet the MPPPM degree requirements.

****Special Note about 7000 (Masters Research) and Special Problem/Topic courses:**

MPPPM students can count CRSS/ENTO/PATH 7000 (Masters Research) for a maximum of 3 credit hours during a semester when actively working on a research or internship project. Graduate students on an assistantship will often have more than 3 hours of 7000 credits as these hours are used to meet the minimum fulltime student semester credit hour requirement. However, only 3 hours can be counted in your program of study. Special Problems or Topics courses (PATH 8160, ENTO 8900, CRSS 8210) can be used to meet Area II or III requirements. However, only one (1) of these courses for a maximum of 3 credit hours can be used within the program of study unless the prior permission is granted by the Graduate Coordinator. Special Problem/Topic courses are not meant to replace subject matter content courses within your program of study.

Credit hours and GPA requirements: Full time students must register for a minimum 12 credit hours for regular semesters, 9 credit hours for summer. All UGA **graduate students must maintain an average GPA of 3.0**. Students with a cumulative graduate course average below 3.0 for two consecutive terms are placed on academic probation by the Graduate School. They then must make a 3.0 or higher in each succeeding semester that their overall cumulative graduate average is below 3.0. Students will be removed from probation when their cumulative graduate average is 3.0 or above. If they make below a 3.0 semester graduate average while on probation, they are dismissed. No grade below C is acceptable for a course to be included on the MPPPM Program of Study. The overall grade point average on this form as well as the cumulative GPA on the UGA transcript must meet the required 3.00 GPA in order for the degree to be awarded by the Graduate School. All graduate students must be enrolled in two out of three semesters in each academic year in order to remain in compliance with the Graduate Enrollment policy <https://grad.uga.edu/index.php/current-students/enrollment-policy/>

MPPPM Core Curriculum

<u>Area</u>	<u>Credits</u>
Area I	19
<i>All are required courses:</i>	
CRSS 6340/L Weed Science (4) *§	
ENTO 6000/L General Entomology (4) *	
ENTO/CRSS/PATH 6740 Integrated Pest Management (3) *	
ENTO/CRSS/PATH 6250 Pesticides and Transgenic Crops (3) *	
PATH 6280/L Diagnosis and Management of Plant Diseases (4) **§	
CRSS/ENTO/PATH 6130 Internship (1)	
Area II	6-12
<i>Select at least one 2- to 4-credit course from each of the three MPPPM departments.</i>	
Area III	6-8
<i>Electives: Select any UGA graduate course related to pest management in the student's area of interest. Please check with the Graduate Coordinator for acceptability of courses not in the three departments, CRSS, ENTO, PATH early in the program to avoid the possibility of electives not counting toward the 33 minimum credits</i>	
For students entering program as of Fall 2020: STAT 6315 (Statistical Methods for Researchers) (4) is required and highly recommended for all who entered in 2020	
Total	33

* If a student has already taken one of the required Area I courses as part of their UGA undergraduate degree, then a course within the same department can be substituted for the Area I course. Course substitutions must be pre-approved by the Graduate Coordinator.

** PATH 6280 has an undergraduate Introductory Plant Pathology (PATH 3530) prerequisite that is required.

§ PATH 6280/6280L and CRSS 6340/6340L cannot be taken during the same fall semester as the class and lab meeting times conflict with each other.

See Special Note about using CRSS/ENTO/PATH 7000 (Masters Research) and Special Problem/Topic courses on preceding page to fulfill Area II or III course requirements.

Possible courses to meet MPPPM course requirements arranged by typical semester offerings is on the next page. NOTE: This is only a guide. You must check the current UGA course listing within Athena and semester class schedules for availability.

Course Requirements	Fall Semester	Spring Semester	Summer Semester
Complete the following 19 hours (Area I required courses)			
CRSS 6340/6340L Weed Science (4)*	CRSS 6340/L		
ENTO 6000/6000L General Entomology (4)*	ENTO 6000/L		
PATH 6280/6280L Diagnosis and Management of Plant Diseases (4)	PATH 6280/L		
ENTO/CRSS/PATH 6250 Pesticides and Transgenic Crops (3)*		ENTO/CRSS/PATH 6250	
ENTO/CRSS/PATH 6740 Integrated Pest Management (3)*	ENTO/CRSS/PATH 6740		
CRSS/ENTO/PATH 6130 Internship (1)*	CRSS/ENTO/PATH 6130	CRSS/ENTO/PATH 6130	CRSS/ENTO/PATH 6130
Select at least one 2- to 4-credit course from each of the three MPPPM departments (CRSS/ENTO/PATH) 6-12 hours (Area II)			
ENTO 8900 Special Problems (1-9) must be arranged with instructor	ENTO 8900 (arranged)	ENTO 8900 (arranged)	ENTO 8900 (arranged)
CRSS 8210 Special Problems in Crop and Soil Sciences (1-3)	CRSS 8210 (arranged)	CRSS 8210 (arranged)	CRSS 8210 (arranged)
PATH 8160 Special Topics in Plant Pathology (1-3)	PATH 8160 (arranged)	PATH 8160 (arranged)	PATH 8160 (arranged)
CRSS 6350 Herbicide Technology (3) **		CRSS 6350	
CRSS 6260 Forage Management and Utilization (3)		CRSS 6260	
ENTO 6350/L Crop Specific Insect Management (4)**			ENTO 6350/L (Tifton)
ENTO 8820 Concepts in Integrated Pest Management (2)		ENTO 8820	
PATH/ENTO 6360 Ornamental Pest Management (3)	PATH/ENTO 6360 (even years)		
PATH 8000 Field Plant Pathology (1)**	PATH 8000		PATH 8000
PATH 8300 Clinical Plant Pathology (2)		PATH 8300 (Athens - arranged)	PATH 8300 (arranged)
Electives - any graduate courses related to pest management in CRSS/ENTO/PATH or others with committee pre-approval 6-8 hours (Area III)			
CRSS 8210 Special Problems in Crop and Soil Sciences (1-3)	CRSS 8210 (arranged)	CRSS 8210 (arranged)	CRSS 8210 (arranged)
ENTO 8900 Special Problems (1-3) must be arranged with instructor	ENTO 8900 (arranged)	ENTO 8900 (arranged)	ENTO 8900 (arranged)
PATH 8160 Special Topics in Plant Pathology (1-3)	PATH 8160 (arranged)	PATH 8160 (arranged)	PATH 8160 (arranged)
CRSS 6030/6030L Sensors in Precision Agriculture		CRSS 6030/L (Tifton)	
CRSS 6050/L Improving Nutrient...GIS (4)**	CRSS 6050/L		
CRSS 6060 Advanced Topics in Precision Agriculture (3)		CRSS 6060	
CRSS 6260 Forage Management and Utilization (3)		CRSS 6260	
CRSS 6360 Weed Science Field Trip (1)**			CRSS 6360
CRSS 6450 Crop Physiology (3)		CRSS 6450 (even years)	
CRSS 6580 Soil Erosion Conservation (3, E version online)**	CRSS 6580		
CRSS 6800 Agricultural Biotechnology (3)**	HORT/CRSS 6800		
CRSS/ENTO/PATH 7000 Master's Research (max 3 credits)	CRSS/ENTO/PATH 7000 (arranged)	CRSS/ENTO/PATH 7000 (arranged)	CRSS/ENTO/PATH 7000 (arranged)
CRSS 8140 Advanced Crop Breeding (3)	CRSS 8140 (odd years)		
PATH 8000 Field Plant Pathology (1)**	PATH 8000		PATH 8000
PATH 8410 Advanced Plant Disease Management (3)	PATH 8410		
ONLINE COURSES			
CRSS 6430E Plant Physiology (3)		CRSS 6430E	
ENTO 6500E Biological Control (3)		ENTO 6500E	
ENTO 6770E Plant Pollinator Your Place (3)			ENTO 6770E
ENTO 7730E Entomology for Teachers (3)		ENTO 7730E	
* If a student has had the 4000-level equivalent of CRSS 6340, ENTO 6000, ENTO/CRSS/PATH 6740 or ENTO/CRSS/PATH 6250 then a substituted course must be selected from the same MPPPM department.			
** Possible substitution course from the same MPPPM department.			
"Special Problems" credit can be used to meet Area II or Area III requirements; HOWEVER, only one (1) Special Problems course for max 3-hr credit can be used in program			

The worksheet below can help in planning your program of study:

<u>MPPPM Core Curriculum</u>	<u>Credit Hrs</u>	<u>Semester</u>
Area I (19 credit hrs)		
<i>All are required courses:</i>		
CRSS 6340/6340L Weed Science	3	Fall
CRSS 6340L Weed Science Lab	1	Fall
ENTO 6000/6000L General Entomology	4	Fall
CRSS/ENTO/PATH 6740 Integrated Pest Management	3	Fall
CRSS/ENTO/PATH 6250 Pesticides and Transgenic Crops	3	Spring
PATH 6280/6280L Diagnosis and Management of Plant Diseases	4	Fall
CRSS/ENTO/PATH 6130 Crop Protection Internship	1	
Total	19	
Area II (6-12 credit hrs)		
<i>Select at least one 2- to 4-credit course from each of the three MPPPM departments.</i>		
CRSS:		
ENTO:		
PATH:		
Total		
Area III (Area of Advisement) (6-8 credit hrs)		
<i>Electives: Select any UGA graduate course related to pest management in the student's area of interest.</i>		
STAT 6315 (Statistical Methods for Researchers)	4	Spring
Total		
Required Credit Hours Completed (33)		

MPPPM Internship

Since the MPPPM program is a professional degree, an internship is required instead of research for a thesis. The internship is designed to strengthen a student's background in integrated pest management and to provide practical experience, such as with a research scientist, a pesticide company, or the Cooperative Extension Service. Prior to the internship, the student will meet with the major professor and discuss such things as the general mission of the employer, nature of anticipated work, and goals of the institution related to integrated pest management. These and other types of information will need to be collected during the internship for inclusion in a written report. The internship project should also be approved by the MPPPM Graduate Coordinator to make sure the planned internship is appropriate for the program. If possible, the student and major professor should meet 4 to 6 weeks after initiation of employment and evaluate the student's progress. It may be desirable to alter the original goals and to be observant for different integrated pest management principles during the remainder of the internship. The recommended deadlines for completing the internship is the 1st week of the last term. Internship reports are due to the MPPPM Graduate Coordinator by October 1 for students graduating in Fall semesters, March 1 for Spring semesters, and June 25 for summer semesters. Students should contact the members of the MPPPM Coordinating Committee for their location to schedule their exit examinations by March 30, July 10, and November 1 for spring, summer, and fall semesters, respectively, and after their internship is approved.

An internship report is required and should be reasonably concise, substantial in character, and reflective of biological principles related to integrated pest management. The report should demonstrate to the MPPPM coordinating committee that the student understands basic and practical implications of integrated pest management and has the ability to: (i) organize information in a clear manner, (ii) produce a professionally useful and technically acceptable report (supervisor can verify that privileged information is being used properly), and (iii) present material in a well-structured form, written in acceptable English. The report should include:

1. Title: The title should be descriptive of the nature of the work.
2. Title page: This should include title, name of student, previous academic degree(s), date of internship, name of employer, name of supervisor, degree program.
3. Approval page: Signatures of all members of the MPPPM coordinating committee and internship supervisor(s).
4. Table of contents
5. Introduction: This section should cover two important points: (i) a description of the employer, its mission, and how its mission relates to integrated pest management, and (ii) the anticipated goals of the student (it may be desirable to prepare an initial draft of this).
6. Description of work: Details should be presented concerning the nature of day-to-day activities and various procedures used during the internship. Methods for conducting the project should be given.

7. Results: Factual information (data) of accomplishments and "failures" should be presented in this section. The information may be either, or both, objective or subjective, and it may be presented in text, tables, and/or figures. Statistical analysis should be conducted on any data collected during the project.
8. Discussion: The Results information should be evaluated, interpreted, and discussed. The discussion should demonstrate independent thinking and an understanding of principles of integrated pest management. Although not required, references may be used to support conclusions.
9. Summary: In this optional section, the internship can be evaluated: how was it important, problems encountered, how could it be improved, etc.
10. Literature cited (if needed): Cite pertinent references.
11. Appendix: Include information that is not suitable for the Results section.

The report will be typed on 8.5" x 11" paper. The margins and page numbers should correspond to the Graduate School requirements for theses and dissertations. Section headings, tables, and figures should follow the guidelines set forth by a discipline journal. The length of the report should be commensurate with the internship; the number of pages is not very significant, but the report(s) should be representative of the nature and variety of activities performed.

NOTE: Even if a grade of "S" (satisfactory) has been assigned to the CRSS/ENTO/PATH 6130 Internship course by the Instructor of Record/Major Professor, the Graduate Coordinator cannot inform the Graduate School that the internship requirement is complete until the Coordinating Committee has reviewed and approved of the final report. Traditionally, the Instructor of Record/Major Professor assigns a grade of "I" (incomplete) until the MPPPM coordinating committee has approved the internship report. Furthermore, students should be expected to complete the report during the semester following the internship semester. Also note that students on academic probation may not enroll for an internship.

Example Abstracts of Recent Internships

- 1) This paper details work done in the UGA County ANR Extension Internship Program and research on UAVs and aerial imagery on crops. For the extension project, I shadowed a county extension agent during his every day job. Consequently I was exposed to multiple farming issues and problems that farmers combat. For the research project, I was trying to determine if imagery from a UAV helicopter can be a useful tool for pest management under the direction of Glen Rains. Other research was done on GPS and how much the points move on a day to day basis at different heights. Flights were conducted at the same time of day and once at a later time in the day to see the difference. Measurements were taken from video taken during flight on a computer program to determine the differential distance of the GPS. The average GPS has a 3 meter differential/ error. Data concluded that the GPS on the copter had a differential/ error of

only 1.33 meters. An MPPPM internship is a great learning opportunity for any student looking to work in the agricultural industry.

- 2) The cowpea curculio, *Chalcodermus aeneus* (Boheman) (Coleoptera: Curculionidae), is the key pest of southern pea or cowpea, *Vigna unguiculata* (L.), in Georgia and elsewhere in the southeastern USA. There has never been an effective trapping method reported for this pest. We developed a modified Tedder's trap that was tested against standard boll weevil traps and yellow sticky traps. The new trap detected *C. aeneus* adults earlier and in greater numbers than the other trapping methods. The new trap was used to monitor weekly movement of *C. aeneus* adults for two annual cycles in 2012 and 2013 at multiple locations. The detection of adults was consistent with early spring movement from overwintering sites followed by a summer generation and a fall generation. No adults were collected in traps from the end of December to the end of March. The temporal distribution of *C. aeneus* in traps over the season suggests three distinct periods of adult activity from mid-April to mid-June, late-July to early-October and then mid-November to mid-December. The utility of monitoring *C. aeneus* for regional management strategies is discussed.
- 3) My internship project was conducted under the supervision of Dr. T. Brenneman. Specifically, the project was designed to evaluate several fungicides applied at two different timings for efficacy on *Sclerotinia* stem rot. My internship was an invaluable experience where I worked with chemicals and fungi that I learned about in my MPPPM classes. I was able to exercise my knowledge of pesticide safety and sprayer calibration when handling and applying those chemicals. It was a rewarding experience to use skills in the field that I learned in the class room. The central goal of my research was to find the most efficient fungicide for controlling white mold in canola. Fungicide research plays a critical role in finding the best spray program to recommend to farmers. Little research has been conducted in Georgia on canola, and this study showed that there is more research to be done in order to find the most productive spray program. Dr. Brenneman allowed me to work hands-on with the canola throughout the trial. The crop was planted before I started the MPPPM program in the spring of 2014, but I conducted the fungicide applications and took all of the ratings of disease as it progressed. I took 3 different ratings for white mold throughout the season and one rating of *Alternaria* black spot. The *Alternaria* black spot was unexpected and appeared on the seed pods in late April. I entered data into SAS and created the table of results. I also contributed with Dr. Brenneman and Dr. Grey on the disease report attached which will explain my project in more detail.
- 4) This paper details work completed on the UGA Internship program. Cultivars with resistance and tolerance to two different pathogens, Tobacco Black Shank (*Phytophthora*

nicotianae) and Root-knot nematodes were evaluated. Research was performed on the UGA Bowen Farm and the UGA Black Shank Nursery both in Tifton, GA. Different Varieties of tobacco were selected based on pedigrees and know resistance. They were transplanted at the farms in *P. nicotianae* and *Meloidogyne arenaria* disease nurseries and data was collected the entire growing season. Varieties with the PHP gene have resistance to Race 0 of tobacco blacks shank and the Florida 301 which gene imparts tolerance to Race1 were chosen for the black shank test. For the Nematode trail varieties that showed tolerance or resistance to the root knot nematode in past years were chosen to be evaluated. The nematode variety trial had a few varieties that stood out. The best variety in the trial was the Cross Creek variety CC35 which had excellent yield in the nematode area at the Bowen Farm. Significantly ($P<0.05$) outperformed all other entries in the test. The results from the Black Shank Trial demonstrated that Speights Variety SP225 had very promising resistance to both races of tobacco black shank. It had significantly less loss due to disease then all other varieties in the test. The Black Shank Nursery has over 50 years of continuous black shank, and represents the highest level of Black Shank severity that could be expect at the farm level.

MPPPM Internship Committee Approval Form

(Note: requires a simple majority of signatures, a minimum of one from each department (or attached email with signature authorization for Coordinator’s initials) and internship instructor/major professor signature for the Graduate Coordinator to issue a final approval)

MPPPM Student Name: _____

Athens Campus

Will Hudson, Department of Entomology

Miguel Cabrera, Department of Crop & Soil Sciences

Jean Williams-Woodward, Department of Plant Pathology

Tifton Campus

Alton “Stormy” Sparks, Jr., Department of Entomology

Glen Harris, Department of Crop & Soil Sciences

Bhabesh Dutta, Department of Plant Pathology

Griffin Campus

David Buntin, Department of Entomology

Paul Raymer, Department of Crop & Soil Sciences

James Buck, Department of Plant Pathology

Internship Instructor/Major Professor

_____, Department of _____

Exit Examination

The Master of Plant Protection and Pest Management (MPPPM) degree program has a final examination requirement of all students. The purpose of the examination is to measure education capabilities that encompass the entire program of the student. The examination consists of three discipline-specific written or oral exams that are taken by the end of the semester of intended graduation and after coursework in Area I has been completed. The exit exams for plant pathology, entomology, and weed science will be administered by the MPPPM Coordinating Committee members at the UGA campus location where the student is housed. The exams will cover specific information and general concepts learned during the overall graduate program, including prerequisites, and core courses in Area I. The student must have the internship report approved before taking the final exam to complete requirements for graduation. It is recommended that the student talk with his/her Major Professor and Exit Examining Coordinating Committee members about the range of pest management information with which they should be familiar during their program and to request any recommended reading in preparation for the exams.



MPPPM Exit Exam Committee Approvals

(Note: requires a minimum of three signatures, one from each department from any combination of the 9 possible Coordinating Committee signatures or three attached emails with signature authorization for the Graduate Coordinator initials to be complete)

MPPPM Student Name: _____

Student's UGA Campus (Athens, Tifton, or Griffin)

Committee Member, Department of Entomology

S/U grade

Committee Member, Department of Crop & Soil Sciences

S/U grade

Committee Member, Department of Plant Pathology

S/U grade

GENERAL STUDENT INFORMATION

Assistantships and Tuition Waivers

Admission into the MPPPM degree program does not guarantee funding for a graduate assistantship or tuition waiver. However, academic units of the university may employ graduate students in four types of graduate assistantships: teaching assistantship, lab assistantship, research assistantship, and general (including extension) graduate assistantship. The type of assistantship offered a student depends on the needs of the academic or administrative unit, the qualifications of the individual student, and availability of funds. Whenever possible, the duties assigned to a graduate assistant should be relevant to the graduate program and the professional goals of the student.

Many full-time academic graduate students in the MPPPM program receive financial aid in the form of a one-third time (33.33%) assistantship that pays \$17,459 for the Master's Degree (2020 estimate). Graduate students on assistantships also receive out-of-state tuition waivers and in-state fee reductions. Students are responsible for paying incidental university fees assessed based upon UGA campus location. See <https://grad.uga.edu/index.php/current-students/financial-information/> for details. Students on a one-third time graduate assistantships are expected to work at least 13.3 hours per week over and beyond the work required to carry out their own internship projects and coursework. Students unable to meet the hourly work expectations will have to self-pay their tuition and fees.

Where do the funds for assistantships come from? These are typically provided by major professors who have a research project that is funded through contracts and/or grants that they have managed to acquire for the completion of that specific research project. Thus, the funds are not “free”, but tied to specific work that needs to be completed in a timely fashion. Since the research assistantship is typically year-round, the student needs to be prepared to become part of that UGA laboratory's regular personnel. One advantage of this situation is that the student gets to work directly in a university research laboratory while completing MPPPM coursework. The student also is usually assigned lab/office space directly on campus.

In recent years, MPPPM students have also been able to qualify for Extension Internship grants (note not necessarily the same thing as the academic internship course CRSS/ENTO/PATH 6130 unless set up by the Major Professor) and very recently general extension graduate assistantships through the University of Georgia Cooperative Extension Service. These funds are also tied to specific extension projects in specific Georgia counties working with county extension Agriculture and Natural Resource (ANR) agents (see interactive map at the website <http://extension.uga.edu/about/county/> for county office locations). One advantage of this

situation is that the students get profession experience with grower clientele, directly interacting with commercial agricultural industry while completing the MPPPM coursework.

What about actively employed students that do not have extra time outside of their jobs to commit to an assistantship? These students are ineligible for a graduate assistantship and will have to self-pay for their tuition and fees. However, the MPPPM program has been fortunate to have working professional graduate students where their employers pay tuition directly with no waiver because of their belief in the high value of the MPPPM program for their company's employees. These students are also required to have a Major Professor, but the relationship is a bit different in that the Major Professor does not have to find funds to support the student. In this case, the company gains direct access to the Major Professors area of expertise, often developing internship (research or informational) programs in this area of expertise at the company location.

What about students actively employed by the University of Georgia? These students may be eligible for the Tuition Assistance Program (TAP). TAP is a supplemental educational assistance program for University System of Georgia employees. TAP provides free tuition and student fees for up to nine (9) credit hours per semester for USG employees who have been full-time, benefits eligible for at least six months prior to the TAP application deadline for the term for which they are applying. All employees will be required to go through the regular student admissions process prior to applying for TAP and employees must complete a TAP application for each semester in attendance. Certain courses and programs are ineligible for TAP under Board of Regents policy as follows. Those ineligible programs, or courses of study, include academic courses in the following professional schools: dental, law, medical, pharmacy, veterinary, or executive/premiere or comparable graduate school programs. Other ineligible programs, or courses of study, include: workshops, seminars, continuing education courses, management development programs, special examinations for admissions to degree programs, or private consultant refresher courses to take examinations such as C.P.A. certification, admissions examinations, and related types of programs or classes. Support for these types of programs, may be provided by departmental policies. Please review all TAP policies, procedures, frequent questions, and other information available on the University System of Georgia (USG) website, https://www.usg.edu/hr/benefits/tuition_assistance_program. The USG system-wide TAP application form is also available on the USG website. Application deadlines for TAP are: Fall-July 15, Spring-November 15, and Summer-April 15. TAP forms should be mailed to Aaron Weimer, Office of the Registrar, University of Georgia, Holmes/Hunter Academic Building, 101 Herty Drive, Athens, GA 30602-6113. For questions, contact the Tuition Assistance Program coordinator at tap@uga.edu or 706-542-4040.

Online Access to Classes

Online or remote access to class lectures and other course materials is up to the discretion of the Instructor of Record for a given course. The level of online access will be set by the Instructor of Record; however, standard access is done through the learning management system at UGA which is called eLearning Commons, or simply eLC, powered by D2L/Brightspace. If you need assistance with eLC, you have a number of options to get help using the system. First, you can contact the EITS Help Desk by email helpdesk@uga.edu or telephone (706) 542-3106. The business hours are 8am - 10pm (Mon-Thurs), 8am-6pm (Fri), and 1pm-7pm (Sat-Sun). You can also go to the University System of Georgia D2L Help Center at <http://D2Lhelp.view.usg.edu>. From this site, you can search the Knowledge Base, browse popular articles, or click the link for live chat support (24 hours a day, 7 days per week). Some of the typical questions that students may have about eLC are answered as follows.

1. How do I turn on “Notifications”?

1. On My Home, click on your name at the top right and click Notifications.
2. Confirm your email address and/or register your mobile number (text rates apply).
3. Choose the summary of activity or instant notifications you would like to receive. Summary activity is a daily summary or course activities, instant notifications allow you to choose which activities you would like delivered to your email and/or mobile device.
4. Click Save

2. How do I submit assignments to the Assignment Dropbox?

1. On Course Home navigation bar, click on Tools, then Assignments Dropbox.
2. Select the appropriate Dropbox folder.
3. Select Add a File, Browse, select file and click Upload.
4. Click Submit.

3. How do I email my instructor or other students within the course?

1. On Course Home navigation bar, click on Classlist.
2. If you want to email multiple people, select them by checking the select box next to their name, and then click the email icon at the top of the user list.
3. To email one person, click on their name in the Classlist.
4. Compose message and click Send.

4. I don't see a course in which I'm enrolled. How can I gain access?

1. **Drop/Add:** Student enrollments from Athena to eLC are only updated once each weekday, in the evening. If you drop/add a course today, those changes take 1-2 business days to become active in eLearning Commons. For example, if you drop or add a course on Friday, those changes will not be reflected in eLC until Monday morning.
2. **Course Availability to Students:** Courses are only visible/available to students one day before classes begin through two weeks after grades are due. Course availability/visibility is based on standard session terms that are established by the Registrar (see the [Schedule of Classes](#)). Instructors can change the availability dates of their courses and can also manually add users to their courses. If your course does not follow the established session terms, contact your instructor to gain access.

Career Development

Example Resume (also see <https://career.uga.edu/resumes>)

Abraham Baldwin

228 Baldwin Street, Athens, GA 30601 770-555-1234 abebaldwin@uga.edu www.abebaldwin.com

OBJECTIVE

To obtain a summer 2011 internship in multimedia design/development to further utilize my creativity and experience in Macromedia Flash, JavaScript, Dreamweaver, and website development

EDUCATION

The University of Georgia, Athens, GA
Bachelor of Arts in Journalism, May 2011
Major: Publication Management **Minor:** Philosophy
Certificate: New Media
Cumulative GPA: 3.4/4.0

RELEVANT COURSEWORK

Multimedia for the Web, Interactive Media Authoring, Multimedia Writing, Web Communication, Multimedia Law, News Editing, Photojournalism, Graphic Communication, and Creative Nonfiction

MULTIMEDIA EXPERIENCE

Freelance Web Designer, Abraham Designs, Athens, GA, June 2007-Present

- Create engaging web presences for clients per requests and requirements
- Provide consulting services to evaluate and meet client needs
- Forge and maintain client relationships in order to build successful future business

Web Designer/Graphic Artist, Information Security Center, Valdosta, GA, June 2007-August 2009

- Maintained and designed three corporate websites for nonprofit organization
- Fabricated and manipulated web pages, graphics, and JavaScript in an office environment
- Maintained organized documentation to ensure that application scripts and web pages were dynamic and readily updatable for future employees
- Provided advice regarding graphic design and layout issues
- Instructed 25 peers on website organization and use of Dreamweaver to edit HTML

OTHER EXPERIENCE

Pool Manager, Atlantic Pool Service, Valdosta, GA, May 2009-August 2010

- Managed 400-member swimming facility and honed communication skills
- Maintained organized records for 35 employees utilizing PeopleSoft Database System
- Communicated with Board of Directors to ensure that the needs of the members were met
- Collected entrance fees totaling up to \$500 per day

COMPUTER SKILLS

- **Software:** Macromedia Flash, Director, Dreamweaver, Fireworks; Adobe Photoshop, ImageReady, Illustrator, Premiere, After Effects, Audition; Corel Bryce 5; Microsoft Office Suite (including Access); Apple Final Cut Pro, Quicktime Pro; Digidesign Pro Tools
- **Operating Systems:** Mac OS 9, X; Windows 95-XP; Dos; Linux
- **Programming Languages:** HTML; SQL; CSS; ActionScript; JavaScript; Director Lingo; VBA

AWARDS & HONORS

Broadcast Education Associate (BEA)
 Best of Festival 2005/King Foundation Award Winner, Fixed Media in the "To instruct/Train" category
 Won \$1000 top prize and attended BEA Festival in Las Vegas, NV
 HOPE Scholarship

Career Possibilities for MPPPM Graduates [Contacts]

Careers in for MPPPM graduates in private industries and in State and Federal government can be quite varied. Briefly these include, but are not limited to the:

- 1) Cooperative Extension Service [see <http://extension.uga.edu/about/join/careers.cfm> or comparable sites for other state extension services]
- 2) Pesticide Industry [Top 10 ranked companies in 2008 from the largest: Bayer (Germany), Syngenta (Switzerland), BASF (Germany), Dow AgroSciences (USA), Monsanto (USA), DuPont (USA), Makhteshim Agan (Israel), Nufarm (Australia), Sumitomo Chemical (Japan), and Arysta Lifescience (Japan)]
- 3) Seed Industry [Top 10 ranked companies in 2008 from the largest: Monsanto (US), DuPont (US), Syngenta (Switzerland), Groupe Limagrain (France), Land O' Lakes (US), KWS AG (Germany), Bayer Crop Science (Germany), Sakata (Japan), DLF-Trifolium (Denmark), and Takii (Japan)]
- 4) Academic Institutions [usually a Master's degree is the minimum requirement for a technical college instructor or university laboratory technician, field technician, see <http://www.hr.uga.edu/uga-staff-vacancies> for UGA or comparable sites for other colleges and universities]
- 5) Food & Beverage Industry [Top 16 ranked companies in 2013 from the largest: Pepsico Inc., Tyson Foods Inc., Nestle (U.S. & Canada), JBS USA, Coca-Cola Co., Anheuser-Busch InBev, Kraft Foods Inc., Smithfield Foods Inc., General Mills Inc., ConAgra Foods Inc., Mars Inc., Kellogg Co., Dean Foods Co., Hormel Foods Corp., Cargill Inc., and MillerCoors LLC]
- 6) Crop Consultants [can be independent or employed by other consultants, see <http://naicc.org/about/find-a-member/> or companies like Glades Crop Care, Inc.]
- 7) Urban/Structural Pest Control [Top companies: Orkin Pest Control, Terminix, Black & Decker Pest Control, Riddex Plus Pest Repeller, Bell Environmental Services, Bulwark Exterminating, Steritech Pest Prevention, Southern Pest Control, Ecolab Pest Control, McCloud Services, Plunkett's Pest Control, Wil-Kil Pest Control, Sprague Pest Solutions]
- 8) Federal jobs open only to USA citizens [can be searched at <https://www.usajobs.gov/>]
- 9) The State of Georgia has jobs [listed at <http://agr.georgia.gov/the-job-list.aspx>]
- 10) The Military has careers for entomologists [listed at <http://www.goarmy.com/careers-and-jobs/amedd-categories/medical-service-corps-jobs/entomologist.html>]

