

## **Entomology & Nematology Section, Plant Medicine Comprehensive Exam**

Questions are submitted by all faculty in the department of Entomology and Nematology who teach core courses and internships that are required for the Doctor of Plant Medicine program. The faculty members who submit the questions grade the answers. Heather McAuslane ([hjmca@ufl.edu](mailto:hjmca@ufl.edu)) coordinates this process. Dr. McAuslane will email each student as soon as the exam is graded to set up a time to meet and discuss the exam, including any written comments and noted deficiencies.

### **Part 1. Diagnostics - 30%**

This section includes two questions. The first question involves examining a soil extraction sample for nematodes. The nematodes must be quantified and identified to species using the microscope and keys provided. Questions concerning management of the nematode species will be posed.

The second question concerns an arthropod sample such as that which a grower may present a DPM practitioner in the field. This is a test of the on-the-spot diagnostic abilities of the student and no keys will be provided. The host plant or habitat in which the organism was found will be identified. The student will have to identify, as closely as possible, eight (8) arthropod specimens. These eight arthropod samples will be drawn from the attached list of important insect pests of Florida. Pay attention, for exam purposes, only to those marked with an asterisk denoting them as being important plant pests (98 arthropods). Questions concerning the organism's life history, pest status and management will be posed. We will want to know, for two (2) of the specimens only, in which habitat this arthropod can be found (what hosts, what parts of the plant); whether the arthropod is hemi/holometabolous (where are the various life stages found - this impacts what types of controls will work against them) and what types of controls are effective (cultural, biological, chemical, etc...). We don't want specific pesticide recommendations but you should show that you know where to look these up.

*To prepare for the insect diagnostics question* - A collection of dried specimens of these species has been compiled and is housed in the lab of Dr. John Capinera (Chair, Entomology & Nematology). This collection can be accessed at any time during the student's course of study at UF (ideally students should not wait until the last semester to study them). To learn about the biology of the important plant pests, students can search the Featured Creatures site (<http://creatures.ifas.ufl.edu/>) and the Insect Management Guides on EDIS. An extensively illustrated book "Garden Insects of North American" (Whitney Cranshaw; Amazon.com, \$19.95) also describes the biology of many of these pests.

### **Part 2. Entomology and Nematology concepts and principles - 30%**

This section will comprise seven to 10 questions on the basic principles of Entomology and Nematology that have relevance to a DPM practitioner. Exam questions will be short essay and are similar to those found on the final exams of the required core courses.

### **Part 3. Broad-scope integrative section - 40%**

This section will consist of three to four questions that require the DPM practitioner to integrate knowledge from all areas of Entomology and/or Nematology to answer the question. Questions will require 2 or 3 page essay answers.

## Important Insect Pests in Florida and Their Hosts

\* = Important plant pests

These insects are commonly encountered in Florida and are often important pests. The sight-ID portion of the Entomology final comprehensive exam will focus on the species marked with an asterisk.

Host relationship/importance is:

A= animals and humans;

B=beneficial;

FC=field crops;

FR=fruit or berry crop;

G=turf or forage grass;

N=nuisance or contaminant;

O=ornamental plant;

S=stored products;

T=tree;

V=vegetable crops;

W=wood.

### BEETLES

\*Banded cucumber beetle, *Diabrotica balteata* LeConte; **V**

\*Yellow-margined leaf beetle, *Microtheca ochroloma* Stål; **V**

\*Pepper weevil, *Anthonomus eugenii* Cano; **V**

\*White-fringed beetle, *Naupactus* (= *Graphognathus*) spp.; **V, FR**

\*White grubs, *Phyllophaga* spp.; **V, FR, G, T, O, FC**

\*Southern pine beetle, *Dendroctonus frontalis* Zimmermann; **T**

\*Citrus root weevils (*Pachnaeus litus*; the blue-green citrus weevil, *Pachnaeus opalus*;  
the little leaf notcher, *Artipus floridanus*); **FR**

\*Diaprepes root weevil, *Diaprepes abbreviatus* (Linnaeus); **FR, O, FC, V**

\*Mexican bromeliad weevil, *Metamasius callizona* (Chevrolat); **O**

\*Asian grey weevil, *Myllocerus undecimpustulatus undatus* Marshall; **O**

\*Hunting billbug, *Sphenophorus venatus vestitus* Chittenden; **G**

\*Palmetto weevil, *Rhynchophorus cruentatus* Fabricius; **O, T**

\*Twig girdler, *Oncideres cingulata* (Say); **T**

\*Black twig borer, *Xylosandrus compactus* (Eichoff); **T**

Mexican bean beetle, *Epilachna varivestis* Mulsant; **V, FC**

Colorado potato beetle, *Leptinotarsa decemlineata* (Say); **V**

Striped cucumber beetle, *Acalymma vittatum* (Fabricius); **V**

Green June beetle, *Cotinus nitida* (Linnaeus); **V, FR**

Sawtoothed grain beetle, *Oryzaephilus surinamensis* (Fitch); **S**

Drugstore beetle, *Stegobium paniceum* (Linnaeus); **S**

Cigarette beetle, *Lasioderma serricorne* (Fabricius); **S**

Pales weevil, *Hyllobius pales* (Herbst); **T**

### FLIES

\*American serpentine leafminer, *Liriomyza trifolii* (Burgess); **V, O, FC**

\*Cornsilk fly, *Euxesta stigmatias* Loew and related species; **V**  
 \*Caribbean fruit fly, *Anastrepha suspensa* (Loew); **FR**  
 \*Darkwinged fungus gnats, *Bradysia* spp.; **O, V**  
 Asian tiger mosquito, *Aedes albopictus* (Skuse); **A**  
 Florida SLE mosquito, *Culex nigripalpus* Theobald; **A**  
 Black salt marsh mosquito, *Ochlerotatus taeniorhynchus*; **A**  
 Eastern salt marsh mosquito, *O. sollicitans* (Walker); **A**  
 Common malaria mosquito, *Anopheles quadrimaculatus* Say; **A**  
 Dark ricefield mosquito, *Psorophora columbiae* (Dyar & Knab); **A**  
 Floodwater mosquito, *Coquillettidia perturbans* (Walker); **A**  
 Stable fly, *Stomoxys calcitrans* (Linnaeus); **A**  
 Deer flies, *Chrysops* spp. and others; **A**  
 Horse flies, *Tabanus* spp. and others; **A**  
 Moth flies, *Psychoda* spp.; **N**  
 House fly, *Musca domestica* Linnaeus; **N**  
 Humpbacked or Phorid flies; **N**  
 Soldier flies; **B, N**  
 Lovebug, *Plecia nearctica* Hardy; **N**

#### **BUGS, ETC.**

\*Leaf-footed bug, *Leptoglossus phyllopus* (Linnaeus); **V, O, FC, FR**  
 \*Squash bug, *Anasa tristis* (DeGeer); **V**  
 \*Lantana lace bug, *Teleonemia scrupulosa* Stål; **O**  
 \*Garden fleahopper, *Halticus bractatus* (Say); **V**  
 \*Southern chinch bug, *Blissus insularis* Barber; **G**  
 \*Brown stink bug, *Euschistus servus* (Say); **FC, V, FR**  
 \*Southern green stink bug, *Nezara viridula* (Linnaeus); **V, O, FC, FR**  
 \*Harlequin bug, *Murgantia histrionica* (Hahn); **V**  
 \*Jadera bug, *Jadera haemataloma* (Herrich-Schaeffer); **N, T**  
 \*Silverleaf whitefly, *Bemisia argentifolii* Bellows and Perring; **FC, O, V**  
 \*Citrus whitefly, *Dialeurodes citri* (Ashmead); **FR**  
 \*Cloudywinged whitefly, *Singhiella citrifolii* (Morgan); **FR**  
 \*Citrus blackfly, *Aleurocanthus woglumi* Ashby; **FR**  
 \*Cabbage aphid, *Brevicoryne brassicae* (Linnaeus); **V**  
 \*Green peach aphid, *Myzus persicae* (Sulzer); **O, FC, V, FR**  
 \*Melon aphid, *Aphis gossypii* Glover; **FC, FR, V, O**  
 \*Potato aphid, *Macrosiphum euphorbiae* (Thomas); **V, O**  
 \*Brown citrus aphid, *Toxoptera citricida* (Kirkaldy); **FR, O**  
 \*Pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green); **O**  
 \*Papaya mealybug, *Paracoccus marginatus* Williams; **FR, O**  
 \*Longtailed mealybug, *Pseudococcus longispinus* (Targioni-Tozzetti); **FR, O, T**  
 \*Cycad aulacaspis scale, *Aulacaspis yasumatsui* Takagi; **O**  
 \*Tea scale, *Fiorinia theae* Green; **O, T**  
 \*Citrus snow scale, *Unaspis citri* (Comstock); **FR**  
 \*False oleander scale, *Pseudaulacaspis cockerelli* (Cooley); **O, T**  
 \*White peach scale, *Pseudaulacaspis pentagona* (Targioni-Tozzetti); **FR, O, T**  
 \*Green scale, *Coccus viridis* (Green); **O, T**

- \*Florida wax scale, *Ceroplastes floridensis* (Comstock); **O, T**
- \*Hemispherical scale, *Saissetia coffeae* (Walker); **O, FR**
- \*Pyriform scale, *Protopulvinaria pyriformis* (Cockerell); **FR, O**
- \*Cottony cushion scale, *Icerya purchasi* Maskell; **FR, O**
- \*Lobate lac scale, *Paratachardina pseudolobata* (Chamberlin); **O, T**
- \*Citrus psyllid, *Diaphorina citri* Kuwayama; **FR**
- \*Glassywinged sharpshooter, *Homalodisca coagulata* (Say); **FR, O**
- \*Twolined spittlebug, *Prosapia bicincta* (Linnaeus); **G**

#### **ANTS, BEES, ETC.**

- \*Red imported fire ant, *Solenopsis invicta* Buren; **A, N, V, FC**
- Crazy ant, *Paratrechina* spp.; **N**
- Florida carpenter ant, *Camponotus floridanus* (Buckley); **N**
- Pharaoh ant, *Monomorium pharaonis* (Linnaeus); **N**
- Acrobat ant, *Crematogaster ashmeadi* (Emery); **N**
- Whitefooted ant, *Technomyrmex difficilis* Forel; **N**
- Elongate twig ant, *Pseudomyrmex gracilis* (Fabricius); **A, N**
- Carpenter bee, *Xylocopa virginica* (Linnaeus); **W**
- Honey bee, *Apis mellifera* Linnaeus; **B, N**
- Cicada killer, *Sphecius speciosus* (Drury); **B, N**

#### **MOTHS AND BUTTERFLIES**

- \*Fall webworm, *Hyphantria cunea* (Drury); **T**
- \*Oleander caterpillar, *Syntomeida epilais* Walker; **O**
- \*Palm leafskeletonizer, *Homaledra sabalella* (Chambers); **T**
- \*Citrus leafminer, *Phyllocnistis citrella* Stainton; **FR**
- \*Bean leafroller, *Urbanus proteus* (Linnaeus); **V**
- \*Eastern tent caterpillar, *Malacosoma americanum* (Fabricius); **T, N**
- \*Forest tent caterpillar, *Malacosoma disstria* Hübner; **T**
- \*Tussock moths, *Orgyia detrita*; and whitemarked tussock moth, *Orgyia leucostigma*; **T**
- \*Armyworm, *Pseudaletia unipuncta* (Haworth); **FC, V**
- \*Granulate cutworm, *Agrotis subterranean* (Fabricius); **FC, V, O**
- \*Southern armyworm, *Spodoptera eridania* (Cramer); **FC, O, V**
- \*Beet armyworm, *Spodoptera exigua* (Hübner); **FC, V**
- \*Fall armyworm, *Spodoptera frugiperda* (J. E. Smith); **G, FC, V**
- \*Yellowstriped armyworm, *Spodoptera ornithogalli* (Guenée); **FC, V**
- \*Corn earworm, *Helicoverpa zea* Boddie; **FC, FR, O**
- \*Velvetbean caterpillar, *Anticarsia gemmatalis* Hübner; **FC**
- \*Cabbage palm caterpillar, *Litoprosopus futilis* (G. & R.); **T**
- \*Cabbage looper, *Trichoplusia ni* (Hubner); **V, FC, O**
- \*Florida fern caterpillar, *Callopietria floridensis* Guenée; **O**
- \*Azalea caterpillar, *Datana major* Grote & Robinson; **O**
- \*Imported cabbageworm, *Pieris rapae* (Linnaeus); **V**
- \*Diamondback moth, *Plutella xylostella* (Linnaeus); **V**
- \*Cross-striped cabbageworm, *Evergestis rimosalis* (Guenée); **V**
- \*Tropical sod webworm, *Herpetogramma phaeopteralis* Guenée; **G**
- \*Lesser cornstalk borer, *Elasmopalpus lignosellus* (Zeller); **FC, V**

\*Melonworm, *Diaphania hyalinata* (Linnaeus); **V**  
\*Pickleworm, *Diaphania nitidalis* (Stoll); **V**  
\*Grape root borer, *Vitacea polistiformis* (Harris); **FR**  
\*Tobacco hornworm, *Manduca sexta* Linnaeus; **V, FC**  
Oakworms, *Anisota* spp.; **T**  
Oak leafrollers, *Archips semiferana* (Walker); **T**  
Carpenterworm, *Prionoxystus robiniae* (Peck); **T**  
Saddleback caterpillar, *Sibine stimulae* (Clemens); **T, A**  
Puss caterpillar, *Megalopyge opercularis* (J.E. Smith), **A**  
White flannel moth caterpillar, *Norape ovina* (Sepp); **T, A**  
Io moth, *Automeris io* (Fabricius); **O, A**  
Orangedog, *Papilio cresphontes* Cramer; **FR**  
Indianmeal moth, *Plodia interpunctella* (Hübner); **S**  
Household casebearer (Plaster bagworm), *Phereoeca uterella* Walsingham; **N**

### **GRASSHOPPERS AND CRICKETS**

\*American grasshopper, *Schistocerca americana* (Drury); **FR, T, O**  
\*Eastern lubber grasshopper, *Romalea guttata* (Houttuyn); **FR, T, O**  
\*Southern mole cricket, *Scapteriscus borellii* Giglio-Tos; **G**  
\*Tawny mole cricket, *Scapteriscus vicinus* Scudder; **G**

### **WALKINGSTICKS**

Twostriped walkingstick, *Anisomorpha buprestoides* (Stoll); **N**

### **PSOCIDS**

Bark lice; **N**  
Book lice; **N**  
Grain psocid, *Lachesilla pedicularia* (Linnaeus); **S**

### **COCKROACHES**

American cockroach, *Periplaneta americana* (Linnaeus); **N**  
Asian cockroach, *Blatella asahinai* Mizukobo; **N**  
German cockroach, *Blatella germanica* (Linnaeus); **N**  
Florida woods cockroach, *Eurycotis floridana* (Walker); **N**

### **FLEAS**

Cat flea, *Ctenocephalides felis* Bouché; **A**

### **TERMITES**

Eastern subterranean termite, *Reticulitermes flavipes* (Kollar); **W**  
Formosan termite, *Coptotermes formosanus* Shiraki; **W**  
Drywood termites; **W**

### **THRIPS**

\*Western flower thrips, *Frankliniella occidentalis* (Pergande); **O, V, FC**  
\*Melon thrips, *Thrips palmi* Karny; **V**  
\*Florida flower thrips, *Frankliniella bispinosa* (Morgan); **FR, FC, V**  
\*Cuban laurel thrips, *Gynaikothrips ficorum* (Marchal); **O**

## **MITES**

\*Broad mite, *Polyphagotarsonemus latus* (Banks); **V**

\*Twospotted spider mite, *Tetranychus urticae* Koch; **O, V, FC, FR**

\*Tomato russet mite, *Aculops lycopersici* (Masse) ; **V**

\*Citrus rust mite, *Phyllocoptruta oleivora* (Ashmead); **FR**

## **TICKS**

Lone star tick, *Ambylomma americanum* (Linnaeus); **A**

Brown dog tick, *Rhipicephalus sanguineus* (Latreille); **A**

Blacklegged tick, *Ixodes scapularis* Say; **A**

Last updated January 15, 2009