

UF / IFAS
PALM BEACH COUNTY COOPERATIVE EXTENSION SERVICE
LIMITED COMMERCIAL LANDSCAPE MAINTENANCE (LCLM)
LIMITED LAWN & ORNAMENTAL
STUDY MATERIALS

October 2016

FOOL PROOF APPLICATIONS

Limited Certification Application Materials:

http://www.freshfromflorida.com/content/download/23511/484250/limited_landscape_pkt.pdf

What to send (if taking test later):

1. Completed application for Limited Certification with 1 ½" x 1 ½" clear, full-face photo attached
2. Proof of insurance from insurance agent
3. Check for \$150.00 made out to FDACS
4. Proof of completion of 6 hours of CEUs (you will receive this today)

Web-Based Exams Instructions: Attached, Page 4

What happens next:

4 items sent to the Bureau of Licensing and Enforcement, Pest Control Section

1. Upon approval, a test admission slip is provided to the applicant (approximately 6-8 weeks)
2. Make arrangements with the County Extension Service office to take the LCLM examination
3. Our office sends exam to the Bureau of Entomology and Pest Control
4. The exam is then graded and certificates issued to applicants who successfully pass the examination and provide proof of minimum liability insurance
5. Annual renewal required
 - a. Keep your address and name changes current (in writing)! - Letter sent out 2 months prior to renewal requirement
 - b. Must obtain 4 CEUs each year - 2 in core and 2 in area of specialty

Questions / Responses:

Bureau of Licensing and Enforcement, Pest Control Section
3125 Conner Blvd., Bldg. 8
Tallahassee, FL 32399- 1650
(850) 617-7997, Fax (850) 617-7967

In accordance with the provisions of ADA, auxiliary aids and service will be provided upon request by calling
(561) 233-1714

An Equal Opportunity Institution

SUGGESTED STUDY MATERIALS

GENERAL REFERENCE AVAILABLE FROM UF/IFAS BOOKSTORE (800.226.1764) OR WWW.IFASBOOKS.COM GO TO CATEGORIES THEN [PESTICIDES - EXAM STUDY MATERIALS](#)

- Applying Pesticides Correctly, SM 1; Also available in DVD format, SM69
- Ornamental and Turfgrass Pest Management, SM 7; Also available in DVD format, SM 74

LAWS, PESTICIDE SAFETY & PERSONAL PROTECTIVE EQUIPMENT

- [Licensing of Lawn and Ornamental Pesticide Applicators in Florida](http://edis.ifas.ufl.edu/pi006): <http://edis.ifas.ufl.edu/pi006>
- [Federal Regulations Affecting Use of Pesticides](http://edis.ifas.ufl.edu/pi168): <http://edis.ifas.ufl.edu/pi168>
- [The 2010 Florida Statutes, Chapter 482: Structural Pest Control Act](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0400-0499/0482/0482ContentsIndex.html&StatuteYear=2010&Title=-%3E2010-%3EChapter%20482): http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0400-0499/0482/0482ContentsIndex.html&StatuteYear=2010&Title=-%3E2010-%3EChapter%20482
- [Rule Chapter: 5E-14: Entomology – Pest Control Regulations](https://www.flrules.org/gateway/ChapterHome.asp?Chapter=5E-14): <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=5E-14>
- [Toxicity of Pesticides](http://edis.ifas.ufl.edu/pi008): <http://edis.ifas.ufl.edu/pi008>
- [Disposal of Containers](http://edis.ifas.ufl.edu/pi010): <http://edis.ifas.ufl.edu/pi010>
- [Posting of Lawn and Ornamental Pesticide Applications](http://edis.ifas.ufl.edu/pi005): <http://edis.ifas.ufl.edu/pi005>
- [482.2267 Registry of persons requiring prior notification of the application of pesticides](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0482/Sections/0482.2267.html): http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0482/Sections/0482.2267.html
- [January 14, 2015 list](http://www.freshfromflorida.com/content/download/42074/888599/Memo_922.pdf): http://www.freshfromflorida.com/content/download/42074/888599/Memo_922.pdf
- Personal Protective Equipment : <http://edis.ifas.ufl.edu/ae244> ; <http://www.oroasha.org/pdf/pubs/1018.pdf>
- [Florida Yards and Neighborhoods Publications](http://ffl.ifas.ufl.edu/homeowners/publications.htm): <http://ffl.ifas.ufl.edu/homeowners/publications.htm>
- Attached: EPA Chemical Resistance Category Chart, Pages 5 & 6
- Attached: Suggested Pesticide Recordkeeping Form, Page 7

THE LABEL, FORMULATIONS & CALIBRATION

- [Interpreting Pesticide Label Wording](http://edis.ifas.ufl.edu/pi071): <http://edis.ifas.ufl.edu/pi071>
- [Using Your Handheld Lawn and Garden Sprayer](http://edis.ifas.ufl.edu/pi211): <http://edis.ifas.ufl.edu/pi211>
- [Calibration of Sprayers \(Also Seeders\)](http://www.ianrpubs.unl.edu/epublic/live/g2044/build/g2044.pdf): <http://www.ianrpubs.unl.edu/epublic/live/g2044/build/g2044.pdf>
- [Single-nozzle Backpack or ATV Sprayer Calibration](http://edis.ifas.ufl.edu/pdffiles/WG/WG21700.pdf): <http://edis.ifas.ufl.edu/pdffiles/WG/WG21700.pdf>
- [Spray Gun Calibration](http://edis.ifas.ufl.edu/pi225): <http://edis.ifas.ufl.edu/pi225>
- [Pesticide Calibration Formulas and Information](http://edis.ifas.ufl.edu/wg067): <http://edis.ifas.ufl.edu/wg067>
- Sample Label: Class handouts: <http://www.cdms.net/LDat/ld3UJ023.pdf>; <http://www.cdms.net/LDat/ld3N2005.pdf>; <http://www.cdms.net/LDat/ld24P002.pdf>
- [Preemergence Herbicides for Ornamentals](http://edis.ifas.ufl.edu/wg058): <http://edis.ifas.ufl.edu/wg058>
- [Pesticide Characteristics](http://edis.ifas.ufl.edu/pi202): <http://edis.ifas.ufl.edu/pi202>
- [Understanding Pesticide Formulations](https://www.extension.purdue.edu/extmedia/PPP/PPP-31.pdf) <https://www.extension.purdue.edu/extmedia/PPP/PPP-31.pdf>

PLANT BED CALCULATIONS & INTEGRATED PEST MANAGEMENT

- [Getting Started With an IPM Program](http://njaes.rutgers.edu/pubs/publication.asp?pid=FS936): <http://njaes.rutgers.edu/pubs/publication.asp?pid=FS936>
- Attached: Plant Bed Calculations

SUGGESTED STUDY MATERIALS

WEED MANAGEMENT IN PLANT BEDS

- [Preemergence Herbicides for Use in Ornamentals](http://edis.ifas.ufl.edu/wg058): <http://edis.ifas.ufl.edu/wg058>
 - [Landscape Plants for South Florida Online Weed Key](http://plantbook.org/plantdata/weeds/weedkey_cat_1major.html): http://plantbook.org/plantdata/weeds/weedkey_cat_1major.html
 - [NCSU Turffiles Decision Aids](http://turfid.ncsu.edu): <http://turfid.ncsu.edu>
 - [UC IPM Online Weed Key](http://ipm.ucdavis.edu/TOOLS/TURF/PESTS/beginkey.html): <http://ipm.ucdavis.edu/TOOLS/TURF/PESTS/beginkey.html>
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BASIC INSECT CATEGORIES & MANAGEMENT ON ORNAMENTALS

- [Landscape Insect and Mite Pests by Type](http://edis.ifas.ufl.edu/topic_landscape_insect_pests_by_type) http://edis.ifas.ufl.edu/topic_landscape_insect_pests_by_type
 - [Palm Insects and Mites](http://edis.ifas.ufl.edu/pdffiles/IG/IG01300.pdf) <http://edis.ifas.ufl.edu/pdffiles/IG/IG01300.pdf>
 - [Florida Plant Diagnostic Pest and Disease Updates](http://fpdn.ifas.ufl.edu/update.shtml) <http://fpdn.ifas.ufl.edu/update.shtml>
 - [Florida Division of Plant Industry Pest Alerts](http://www.freshfromflorida.com/pi/pest-alerts/index.html) <http://www.freshfromflorida.com/pi/pest-alerts/index.html>
 - [University of Florida Plant Sample Submission Labs](http://edis.ifas.ufl.edu/pdffiles/SR/SR00700.pdf) <http://edis.ifas.ufl.edu/pdffiles/SR/SR00700.pdf>
 - [Managing Insect and Mite Resistance](http://edis.ifas.ufl.edu/pdffiles/IN/IN71500.pdf) <http://edis.ifas.ufl.edu/pdffiles/IN/IN71500.pdf>
 - [Beneficial Insects](http://edis.ifas.ufl.edu/topic_beneficial_insects) http://edis.ifas.ufl.edu/topic_beneficial_insects
 - [Palm Problem Key](http://flrec.ifas.ufl.edu/palm_prod/palm_problems_key.shtml) http://flrec.ifas.ufl.edu/palm_prod/palm_problems_key.shtml
 - [Lucid Key for Pests and Diseases of Cultivated Palms](http://itp.lucidcentral.org/id/palms/resource) <http://itp.lucidcentral.org/id/palms/resource>
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ORNAMENTAL PLANT DISEASE & NEMATODE MANAGEMENT

- [Palm Diseases](http://edis.ifas.ufl.edu/topic_palm_diseases): http://edis.ifas.ufl.edu/topic_palm_diseases
- [University of Florida Plant Sample Submission Labs](http://edis.ifas.ufl.edu/pdffiles/SR/SR00700.pdf): <http://edis.ifas.ufl.edu/pdffiles/SR/SR00700.pdf>
- [Landscape Pest Nematodes](http://edis.ifas.ufl.edu/topic_landscape_plant_pest_nematodes): http://edis.ifas.ufl.edu/topic_landscape_plant_pest_nematodes
- [University of Florida Nematode Submission Lab](http://edis.ifas.ufl.edu/pdffiles/SR/SR01100.pdf): <http://edis.ifas.ufl.edu/pdffiles/SR/SR01100.pdf>
- [Florida Plant Diagnostic Pest and Disease Updates](http://fpdn.ifas.ufl.edu/update.shtml): <http://fpdn.ifas.ufl.edu/update.shtml>
- [Florida Division of Plant Industry Pest Alerts](http://www.freshfromflorida.com/pi/pest-alerts/index.html): <http://www.freshfromflorida.com/pi/pest-alerts/index.html>

INSTRUCTIONS TO REGISTER FOR WEB-BASED EXAMINATIONS

Tests can only be taken on computers at one of the UF/IFAS locations. Exam results are available immediately when you finish.

The link for the registration process for web-based testing for limited certification is:

<https://pesticideexam.ifas.ufl.edu>

1. Click on '**Apply for examination**'
2. Sign up as a new user **or** if you already have a state issued 5 digit PIN just login. The Department of Agriculture will send you an email with the 5 digit PIN. You will have a link in the email that you need to click on to verify that you received the email and make the 5 digit PIN valid. Remember this 5 digit PIN.
3. Select '**New License**'
4. Select '**Apply for New Pest Control License or Certificate**' from the box in the center of the page. You will then be prompted to select your license type.
5. Select the correct exam that you want to take then select '**Next**'. If you are not sure, please ask for help before selecting the exam from the center box. (**Contact information for help is below**) Now you get to fill out your information on the next form. You will have to input a 4 digit PIN in this form; it is not the same as the first 5 digit PIN. You need to remember this 4 digit PIN as well.
6. When you finish and select '**Next**' you will see a screen asking for verification of the information you entered and asking you to select statements that the information is true and you will abide by the law.
7. Verify all information and check all boxes then select '**Submit Application**'. You will now be asked to make your payment. They offer payment by credit card as well as with a check. Make your choice and select '**Pay Now**'.

You should receive your voucher at this point.

8. You will need to schedule your exam at this site <https://pesticideexam.ifas.ufl.edu>

Contact information for Questions:

Frank Dowdle

fdowdle@ufl.edu

561.996.1657

Personal Protective Equipment

EPA Chemical Resistance Category Chart

For use when PPE section on the pesticide label lists a chemical resistance category.

The Worker Protection Standard requires that labels of pesticides used on farms, and in forests, nurseries and greenhouses list the type of personal protective equipment (PPE) that must be worn with each product. Labels will refer to chemical resistance categories (A-H) for PPE. Items in these categories are made of materials that the pesticide cannot pass through during the times indicated below the chart. Choose the category of resistance which best matches the handling task duration. The categories are based on the solvents used in the pesticides, NOT the pesticides themselves. Therefore, there will be instances where the same pesticide with two different formulations (wetable powder-WP and emulsifiable concentrate-EC, for example) will require PPE from two different chemical resistance categories.

Selection Category Listed on Pesticide Label	Types of Personal Protective Material							
	Barrier Laminate	Butyl Rubber ≥ 14 mils	Nitrile Rubber ≥ 14 mils	Neoprene Rubber ≥ 14 mils	Natural Rubber ≥ 14 mils	Polyethylene	Polyvinyl Chloride (PVC) ≥ 14 mils	Viton ≥ 14 mils
A (a dry and water-based formulation)	high	high	high	high	high	high	high	high
B	high	high	slight	slight	none	slight	slight	slight
C	high	high	high	high	moderate	moderate	high	high
D	high	high	moderate	moderate	none	none	none	slight
E	high	slight	high	high	slight	none	moderate	high
F	high	high	high	moderate	slight	none	slight	high
G	high	slight	slight	slight	none	none	none	high
H	high	slight	slight	slight	none	none	none	high

HIGH: Highly chemical-resistant. Clean or replace PPE at end of each day's work period. Rinse off pesticides at rest breaks.

MODERATE: Moderately chemical-resistant. Clean or replace PPE within an hour or two of contact.

SLIGHT: Slightly chemical-resistant. Clean or replace PPE within ten minutes of contact.

NONE: No chemical-resistance. Do not wear this type of material as PPE when contact is possible.

Entry-Restricted Areas in Nurseries During Pesticide Applications

During Application of a Pesticide	Workers and other persons are Prohibited In:
(1)(a) Applied: aerially, in an upward direction, or using a spray pressure greater than 150 psi (pounds per square inch), or (b) Applied as a: fumigant, smoke, mist, fog, or aerosol	(1) Pesticide treated area plus 100 feet in all directions on the nursery
(2)(a) Applied downward using: a height of greater than 12 inches from the planting medium, a fine spray, or a spray pressure greater than 40 psi and less than 150 psi. (b) Not as in 1 or 2(a) above, but for which a respiratory protection device is required for application by the product labeling	(2) Treated area plus 25 feet in all directions on the nursery
(3) Applied otherwise	(3) Pesticide treated area

Interpreting PPE Statements on Pesticide Labels

Label Statement	Acceptable PPE
Long-sleeved shirt and long pants	Long-sleeved shirt and long pants, or Woven or nonwoven coverall Plastic- or other barrier-coated coverall, or Rubber or plastic suit
Coverall worn over short-sleeved shirt and short pants	Coverall worn over short-sleeved shirt and short pants, or Coverall worn over long-sleeved shirt and long pants, or Coverall worn over another coverall, or Plastic- or other barrier-coated coverall, or Rubber or plastic suit
Coverall worn over long-sleeved shirt and long pants	Coverall worn over long-sleeved shirt and long pants, or Coverall worn over another coverall, or Plastic- or other barrier-coated coverall, or Rubber or plastic suit
Chemical-resistant apron worn over coverall or over long-sleeved shirt and long pants	no substitute
Waterproof suit or liquid proof suit	no substitute
Waterproof gloves	Any rubber or plastic gloves sturdy enough to remain intact throughout the task being preformed
Chemical-resistant gloves	Barrier-laminate gloves, or Other gloves that glove selection charts or guidance indicate are chemical-resistant to the pesticide for the period of time required to perform the task
Chemical-resistance gloves such as butyl or nitrile	Butyl gloves, or nitrile gloves, or Other gloves that glove selection charts or guidance indicate are chemical-resistant to the pesticide for the period of time required to perform the task
Shoes	Leather, canvas, or fabric shoes chemical-resistant shoes, or chemical-resistant boots, or chemical-resistant shoe coverings (booties)
Chemical-resistant footwear	Chemical-resistant shoes, or Chemical-resistant boots, or Chemical-resistant shoe coverings (booties)
Chemical resistant boots	Chemical-resistant boots
Chemical-resistant hood or wide-brimmed hat	Rubber- or plastic-coated safari-style hat or fire-fighter hat, or plastic- or other barrier-coated hood, or rubber or plastic hood Full hood or helmet that is part of some respirators.



Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

SUGGESTED PESTICIDE RECORDKEEPING FORM

ADAM H. PUTNAM
COMMISSIONER

Telephone Number (850) 617-7880

FDACS recommends recordkeeping for all pesticide applications regulated by Chapter 487, F.S., using this form or similar format. When properly completed, this form meets the recordkeeping requirements for restricted use pesticides and the central posting requirements for the federal Worker Protection Standard.

Licensed Applicator (R) _____ License No. (R) _____ Property Owner Authorizing Application (R) _____

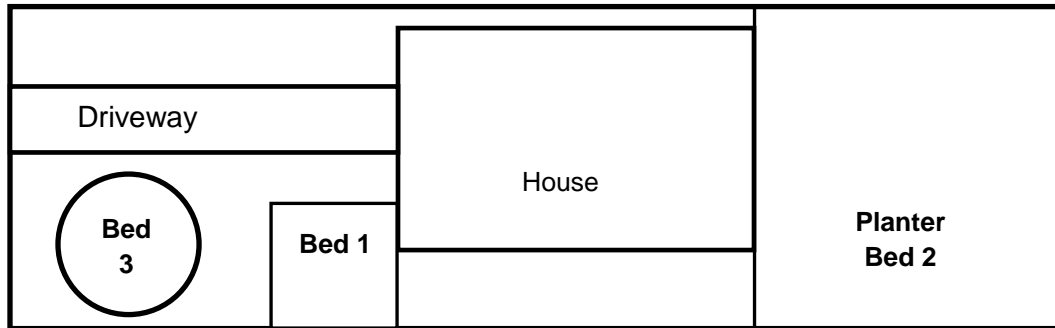
1. Date 2. Start Time 3. End Time All RW	Actual applicator if different from above (include license no. if licensed) (R)	1. Location/Description of Treatment Site (RW) 2. Target Site or Crop (R)	Total Size of Treatment Area (R)	1. Pesticide Brand Name (R & W) 2. EPA Reg. No. (RW) 3. Active Ingredients (W)	Total Amt. of Pesticide Applied (R)	Application Method (R)	Restricted Entry Interval (W)

(R) = For Restricted Use Pesticides

(W) = For Worker Protection Standard Requirement

Plant Bed Calculations

All calculations are for the following yard.



1. How many square feet are in the square planter bed 1?
 - Area of a square = Length X Width
 - Planter Bed 1 is 20 feet by 20 feet, so:
 - 20 feet X 20 feet = 400 ft²
2. How many square feet are in the rectangular planter bed 2?
 - Area of a rectangle is the same as a square = Length X Width
 - Planter Bed 2 is 45 X 50 feet, so
 - 45 feet X 50 feet = 2,250 ft²
3. How many square feet are in the circular planter bed 3?
 - Area of a circle is $\text{Pi} \times R^2$ (the same as 3.14 X Radius X Radius)
 - Radius is half the diameter
 - Diameter is the distance across the widest spot on the circle
 - Planter Bed 3 Diameter in example is 20 feet, so
 - $R = 20/2 = 10$
 - $\text{Pi} \times 10^2 = 3.14 \times 10 \times 10 = 314 \text{ ft}^2$

TYPES OF HERBICIDES

Post-emergent		Pre-emergent
Selective	Non-Selective	
Fluazifop	Glyphosate	Pendimethalin
Bentazon	<i>And others</i>	Prodiamine
Halosulfuron		Oryzalin
Atrazine & 2,4-D (used on turfgrass)		<i>And others</i>
<i>And others</i>		
<p>Note: Always refer to label for specific uses and follow label directions to minimize injury.</p>		

REVIEW QUESTIONS

LAWS, PESTICIDE SAFETY & PERSONAL PROTECTIVE EQUIPMENT

- Who is responsible for the pesticide laws federally?
 - Florida Department of Agriculture and Consumer Services (FDACS)
 - The Division of Agricultural Environmental Services (AES)
 - The U.S. Environmental Protection Agency (EPA)
 - The Pesticide Information Office (PIO)
- What part of the Florida statutes regulates pesticide application around buildings, structures, or plant beds associated with a building?
 - Chapter 482 F.S.
 - Chapter 487 F.S.
 - Chapter 5-E2 F.A.C.
 - Chapter 5-E9 F.A.C.
- Which health effects occur 24 hours or more after a pesticide exposure?
 - Acute
 - Delayed
 - Allergic
 - Chronic
- How long your pesticide records must be kept?
 - 1 year
 - Chapter 482 is not clear on how long
 - 3 years
 - 4 years
- Which chemical is the most harmful?
 - One with a signal word of Caution
 - One with a signal word of Warning
 - One with a signal word of Danger
 - It depends on the toxicity times the exposure
- When do you have to notify someone on the 'Registry of Persons Requiring Prior Notification' of a pesticide application?
 - At the time of application
 - 4 hours before
 - 8 hours before
 - 24 hours before
- How can you notify someone on the 'Registry of Persons Requiring Prior Notification' of your pesticide application?
 - Telephone
 - Mail
 - In person
 - All of the above
- Which part of the body is most likely to receive pesticide exposure?
 - Skin
 - Lungs
 - Mouth
 - Eyes
- If someone gets pesticides on them where is the information that tells them how to take care of the situation?
 - On the label
 - A, C, and D are correct
 - In the 'Statement of Practical Treatment' area
 - In the 'First Aid' area
- Where do you find the Personal Protective Equipment that you should wear?
 - Chemical fact sheet
 - Chemical label
 - Material safety data sheet (MSDS)
 - EPA's web site <http://www.epa.gov>
- What PPE protects your respiratory tract?
 - Goggles
 - Gloves
 - Respirator
 - Apron
- Which is not a proper action if you have a pesticide spill?
 - Control the spill
 - Leave the spill unprotected
 - Contain the spill
 - Clean up the spill

1-C,2-A,3-B,4-B,5-D,6-D,7-D,8-A,9-B,10-B,11-C,12-B

REVIEW QUESTIONS

THE LABEL, FORMULATIONS & CALIBRATION

- Which is not a pesticide?
 - Algaecides
 - Bactericides
 - Insecticides
 - Cidercides
- What is the label? It is a _____
 - Suggestion
 - Law
 - Good idea
 - Recommendation
- A Limited Commercial Landscape Maintenance Certification will allow me to do which of the following?
 - Treat turf grass with herbicides with the signal word of Caution
 - Treat plant beds with any pesticide I can purchase at the chemical dealer
 - Treat the foundation of the house for ants
 - Treat the plant beds with herbicides with the signal word of Caution
- Where is the best place to find the amount of pesticide to use?
 - Material Safety Data Sheet (MSDS)
 - Label
 - Product brochure
 - The chemical representative
- If you find conflicting information about a pesticide you are using, where do you go for the final answer?
 - Material Safety Data Sheet (MSDS)
 - Label
 - Product brochure
 - The chemical representative
- Formulations come in many forms, which one would be most likely to leach?
 - Emulsifiable concentrate (EC)
 - Solutions (S)
 - Dust (D)
 - Wettable powders (WP)
- Adjuvants are always needed?
 - True
 - False
- Of these formulations, which one is most likely to pass through your skin if you get it on you?
 - Emulsifiable concentrate (EC)
 - Solutions (S)
 - Soluble powder (SP)
 - Flowables (F)
- Which are ways pesticide can move off target?
 - Hydrolysis
 - Leaching
 - Drift
 - Both B and C are correct
- The label prohibits several things, which is not one of them?
 - Apply a higher dose than on the label
 - Make 1 more application than the label states
 - Treat pest not listed on the label, if the site is also not on the label
 - Use Chemigation to apply my material if it is not prohibited by the label
- Why calibrate your equipment?
 - To save money
 - A and C are correct
 - To put out the right amount
 - To use less energy
- What factor does not influence ground water contamination?
 - Time of day the application is made
 - The solubility of the pesticide
 - How tightly the material is adsorbed to the soil particles
 - The persistence of the pesticide

1-D,2-B,3-D,4-B,5-B,6-B,7-False,8-A,9-D,10-D,11-B,12-A

REVIEW QUESTIONS

PLANT BED CALCULATIONS & INTEGRATED PEST MANAGEMENT

1. What is the formula for calculating the area of a square?
 1. πR^2
 2. Length X Width
 3. $2\pi R$
 4. Length X Width X Height
2. What is the formula for calculating the area of a rectangle?
 1. πR^2
 2. Length X Width
 3. $2\pi R$
 4. Length X Width X Height
3. What is the formula for calculating the area of a circle?
 1. πR^2
 2. Length X Width
 3. $2\pi R$
 4. Length X Width X Height
4. What is Integrated Pest Management (IPM)?
 1. Eliminate the use of pesticides in pest management strategy
 2. Use the most expensive, but safest pest management strategy
 3. Combine the best, most effective and safest techniques in a pest management strategy
 4. Use only low-toxicity pesticides in pest management strategy
5. What is the first step in an IPM Program?
 1. Keep appropriate records
 2. Identify the pest or problem
 3. Control and evaluate
 4. None of the above
6. What is non-point source pollution and what causes it?
 1. Contaminants moving into water bodies or ground water from a broad area
 2. Contaminants moving into water bodies or ground water from a pesticide spill
 3. Contaminants moving into water bodies or ground water from a fertilizer spill
 4. Contaminants moving into water bodies or ground water from a splashing gas station fuel nozzle
7. Give examples of cultural, mechanical, chemical and biological pest management.
 1. Prune off infested branch and spray remainder of plant with pesticide
 2. Release green lacewing larvae
 3. Drench soil around plant with an insecticide
 4. All of the above
8. Define leaching and runoff.
 1. Pesticide or fertilizer moving down through the soil with water percolation
 2. Pesticide or fertilizer carried by a heavy rain
 3. Pesticide volatilizing into the air
 4. Both A and B
9. Is it possible to completely eradicate most pests?
 1. Yes
 2. No

1-2; 2-2; 3-1; 4-3; 5-2; 6-1; 7-4; 8-4; 9-2

REVIEW QUESTIONS

WEED MANAGEMENT IN PLANT BEDS

1. Sedges have which of the following characteristics?
 - a. Triangular stems
 - b. 3-ranked leaves
 - c. Tubers
 - d. All of the above
2. Which of the following perennial weeds are examples of a broadleaf perennial weed?
 - a. Purple nutsedge
 - b. Bermuda grass
 - c. Dollarweed
 - d. Yellow nutsedge
3. Which of the following weeds thrive under moist conditions?
 - a. Purple nutsedge
 - b. Yellow nutsedge
 - c. Dollarweed
 - d. All of the above
4. Glyphosate is an example of which type of herbicide?
 - a. Selective contact post-emergent herbicide
 - b. Selective systemic post-emergent herbicide
 - c. Non-selective contact post-emergent herbicide
 - d. Non-selective systemic post-emergent herbicide
5. Pendimethalin and Prodiamine are examples of which type of herbicides?
 - a. Selective pre-emergent herbicides
 - b. Selective post-emergent herbicides
 - c. Non-selective pre-emergent herbicides
 - d. Non-selective post-emergent herbicides
6. Which of the following types of weeds are characterized by netlike veins?
 - a. Sedges
 - b. Broadleaf Weeds
 - c. Grasses
 - d. None of the above
7. Weeds are most susceptible to physical control methods and pre-emergent herbicides at which stage?
 - a. Seedling
 - b. Vegetative
 - c. Mature
 - d. Seed
8. In northern and central Florida, crabgrass is considered which type of weed?
 - a. An annual weed
 - b. A biennial weed
 - c. A perennial weed
 - d. None of the above
9. Fluazifop is an example of which type of herbicide?
 - a. Selective pre-emergent
 - b. Selective post-emergent
 - c. Non-selective pre-emergent
 - d. Non-selective post-emergent
10. Which of the following is ***not*** an example of cultural control?
 - a. Selecting the right plant for the site
 - b. Planting plants close together
 - c. Properly preparing the plant site
 - d. Using a pre-emergent herbicide

1-D,2-C,3-D,4-D,5-A,6-B,7-A,8-A,9-B,10-D

REVIEW QUESTIONS

BASIC INSECT CATEGORIES & MANAGEMENT ON ORNAMENTALS

1. What type of feeding do thrips do?
 1. Masticating
 2. Chewing
 3. Piercing/Sucking
 4. Rasping
2. Where do you find most thrips damage?
 1. On flowers
 2. Underside of leaves
 3. Top of leaves
 4. On plant stems
3. What is an example of an insect with piercing-sucking mouthpart?
 1. Billbug
 2. Caterpillar
 3. Webworm
 4. Chinchbug
4. Which insect has chewing mouthparts?
 1. Caterpillar
 2. Beetle
 3. Planthopper
 4. Both a and b above
5. How can you tell the difference between spider mites and insects?
 1. Mites - 6 legs instead of 8 on adults
 2. Mites - 8 legs instead of 6 on adults
 3. Mites have a thorax
 4. Mites are bigger
6. What do we call the excrement that many piercing-sucking insects produce? (Clue: sooty mold often grows on it)
 1. Waxy Flocculent
 2. Frass
 3. Exudate
 4. Honeydew
7. Are slugs and snails insects?
 1. Yes
 2. No
8. What is a sign that plants have spider mites?
 1. Flocculent
 2. Silvery or yellowing leaves
 3. Webbing
 4. Both b and c
9. What do we call an insect skeleton, and where is it located on/in the insect body
 1. Exoskeleton – on the inside
 2. Exoskeleton – on the outside
 3. Endoskeleton – on the outside
 4. Endoskeleton – on the inside
10. Insects with cornicles and pear shaped bodies are:
 1. Mealybugs
 2. Thrips
 3. Aphids
 4. Spider Mites

1-4; 2-1; 3-4; 4-4; 5-2; 6-4; 7-2; 8-4; 9-2; 10-3

REVIEW QUESTIONS

ORNAMENTAL PLANT DISEASE & NEMATODE MANAGEMENT

1. Which of the following causes plant diseases?
 1. Virus
 2. Fungi
 3. Bacteria
 4. All of the above
2. How can you determine if plant parasitic nematodes are a problem for you?
 1. Lab test
 2. Soapy water test
 3. Mole crickets are infested with them
 4. Soil is lumpy
3. How can you determine what plant disease may be a problem for you?
 1. Plant has spots on it
 2. Lab test
 3. Observe under dissecting microscope
 4. Conduct a resistograph test
4. Which of the following plant diseases are caused by fungi?
 1. Leafspots
 2. Rootrot
 3. Mildew
 4. Both 1 and 2
5. How can overwatering cause plant root rot problems?
 1. Some spores are motile in water
 2. Increases root oxygen, reducing stress
 3. Reduces root oxygen, causing stress
 4. Both a and c
6. Which of the following causes major diseases in palms in southeastern Florida?
 1. *Fusarium oxysporum* f. sp. *palmarum*
 2. *Ganoderma zonatum*
 3. *Thielaviopsis paradoxa*
 4. All of the above
7. What typically develops faster; plant wilt caused by fungi, or plant wilt caused by bacteria?
 1. Plant wilt caused by fungi
 2. Plant wilt caused by bacteria
8. What is the most common nematode problem in woody and herbaceous landscape plants?
 1. Root-knot nematode
 2. Spiral nematode
 3. Sting nematode
 4. Reniform nematode
9. What other problem might nematode damage be confused with?
 1. Lack of water
 2. Cold damage
 3. Poor fertilization
 4. All of the above
10. Nematode soil samples should be collected from where for trees and woody or herbaceous landscape plants?
 1. From the leaves
 2. 20 feet out from the trunk
 3. Next to the trunk
 4. At the dripline
11. What condition do you want soil samples containing nematodes to arrive in when they reach the nematode assay lab?
 1. Nematodes are preserved in alcohol
 2. Nematodes are alive in soil sample
 3. Nematodes are preserved by freezing
 4. Nematodes are alive in water

1-4; 2-1; 3-2; 4-4; 5-4; 6-4; 7-2; 8-1; 9-4; 10-4; 11-2

Study Materials Shown Below Can Also Be Found Online At:

<http://www.pbcgov.com/coextension/horticulture/commercial>

Power Point Presentations from today's workshop can be found at the link indicated by the arrow below.

Disease	<ul style="list-style-type: none"> o Downy Mildew on Impatiens - Palm Beach County Fact Sheet o Impatiens Downy Mildew** - webinar presentation by Dr. Aaron Palmateer (1/16/2013) o Professional Disease Management Guide for Ornamental Plants - EDIS Document o Sugarcane Mosaic Virus on St. Augustine grass in Palm Beach County - Fact Sheet
Fertilizing and Irrigation	<ul style="list-style-type: none"> o Facts About the New County Fertilizer Ordinance - Palm Beach County Fact Sheet o Protect Palm Beach County's Water and Environment Brochure o Reclaimed Water Use in the Landscape: Understanding Landscape Irrigation Water Quality Tests - EDIS Document o Recommended formulation for all-purpose fertilizer - Label Example o Summary of IFAS Turf and Landscape Irrigation Recommendations - EDIS Document
Florida-Friendly Landscaping	<ul style="list-style-type: none"> o Questions and Answers: 2009 Florida-Friendly Landscaping™ Legislation - EDIS Document
Hurricanes	<ul style="list-style-type: none"> o Hurricanes - Deciding What to Do - Palm Beach County Fact Sheet
Palms	<ul style="list-style-type: none"> o Fertilization of Field-grown and Landscape Palms in Florida - EDIS Document o Nutrient Deficiencies of Landscape and Field-grown Palms in Florida - EDIS Document
Pests	<ul style="list-style-type: none"> o Insect Management on Landscape Plants - EDIS Document o Natural Insecticides* (2011 Integrated Pest Management) o Thorn Bug - Palm Beach County Fact Sheet o Whiteflies - Palm Beach County Whitefly Taskforce o University of Florida Whitefly Management Presentation: March 12, 2013
Planting	<ul style="list-style-type: none"> o Specifications for Planting Trees and Shrubs in the Southeastern U.S. - EDIS Document
Professionalism / Licensing	<ul style="list-style-type: none"> o Green Industries Best Management Practices (GI-BMP) 2013 training <ul style="list-style-type: none"> o Request a duplicate certificate or update your information o Application for the Limited Certification for Urban Landscape - Commercial Fertilizer o Frequently Asked Questions: Understanding and Obtaining the GI-BMP Certification and Fertilizer License - Palm Beach County Fact Sheet o GI-BMP Instructor Application o What License do I Need? - Palm Beach County Fact Sheet o Limited Commercial Landscape Maintenance, Pesticide Applicator License Test Study Materials ← o Tree Injections: License Requirements - FDACS Memo
	<ul style="list-style-type: none"> o Reclaimed Wastewater Use in Nurseries - 12 minute presentation - followed by this important feedback survey o Reclaimed Water Use in the Landscape Series - EDIS Documents