

MEMO TO: Pesticide Applicator Training & Testing Participants

SUBJECT: Additional Study Materials

Enclosed you will find additional study materials to help you prepare for the Pesticide Applicator test.

Please fill out the Note-Taking Worksheet and bring it with you. We will go over it during the training session.

If you have any questions, please don't hesitate to call me.

Sincerely,



Rick Hirsch
County Extension Agent
Henderson County

RH/sgp

Pesticide Private Applicator License

A private pesticide applicator is someone who uses or supervises the use of restricted-use or state-limited-use pesticides or regulated herbicides to produce an agricultural commodity on:

- ▶ Personally owned property;
- ▶ Rented property;
- ▶ Property owned by his or her employer;
- ▶ Property under his or her general control; or
- ▶ The property of another person if applied without compensation, other than the trading of personal services between producers of agricultural commodities.

An agricultural commodity is a plant or animal grown for sale, lease, barter, feed or human consumption and animals raised for farm or ranch work. No license is required to apply general-use pesticides to produce agricultural commodities.

Licensing Requirements

Individuals who want a private applicator license must:

- attend a private applicator training program offered by Texas AgriLife Extension Service (Extension) or a private entity approved by TDA;
- pass the TDA private applicator exam; and
- purchase a license.

The private applicator license fee is \$60. A private applicator license expires on the fifth anniversary of the date on which it was issued or renewed.

Training

TDA approves Extension and certain private entities to conduct private applicator training. Contact your County Extension Agent or TDA Regional office for training information. A proof of training form is given to those who complete the course. Some training courses are listed here.

The Private Applicator Manual and pesticide laws and regulations may be ordered for a small fee from:

Extension Agricultural and Environmental Safety Program

P.O. Drawer FS,

College Station, Texas 77841

Phone: (979)845-1099

Fax: (979)845-6251

www-aes.tamu.edu

Order forms are available from your county extension office.

Testing

TDA testing is available at some Extension training sessions. Individuals may also take the private applicator test during regular monthly test days at TDA Regional and satellite offices. Please call ahead to make sure space is available. Be sure to present your training form.

Applicants for a license:

- Must be able to read and comprehend the subject matter in English -- no tests are given orally;
- Must obtain a passing grade of 70 percent on the 100 question test;
- Are not charged testing fees; and
- Must successfully complete training and testing, then submit an application for a license along with the nonrefundable fee.

Recertification

Licensed private applicators are required to recertify every five years by obtaining 15 continuing education credits, including two (2) credits in laws and regulations and two (2) credits in integrated pest management (IPM), prior to expiration of the license. Contact TDA for a list of approved courses. A list of courses is also available on TDA's web site: <http://www.tda.state.tx.us/internet/ceucourse/search.jsp>

Recertification Exam

Private applicators may earn the required credits by passing the recertification exam that includes questions on information covered in continuing education courses. If an applicator passes the exam, a certificate of completion for 15 CEUs will be issued. The exam costs \$50 per attempt.

TDA Pest Control Categories

Licensed private applicators are certified to make and supervise applications of restricted-use and state-limited-use pesticides and regulated herbicides in the following categories and subcategories:

1. Agricultural Pest Control
 - A. Field Crop Pest Control
 - B. Fruit, Nut and Vegetable Pest Control
 - C. Weed & Brush Control in pasture and rangeland
 - D. Predatory Animal Control
 - E. Farm Storage Pest Control and Fumigation
 - F. Animal Pest Control
 - G. Citrus Pest Control
 - H. Livestock Protection Collar Application
 - I. M-44
2. Forest Pest Control
3. Ornamental Plant and Turf Pest Control
 - A. Plant Pest & Weed Control
 - B. Greenhouse Pest Control
4. Seed Treatments
6. Aquatic Pest Control
 - A. Aquatic Plant and Animal Pest Control
9. Aerial Application
10. Chemigation
11. Chlorine gas

Applicators who want to be certified in M-44, livestock protection collar and aerial application categories must complete additional requirements.

**THE FORMULAS BELOW MAY BE NEEDED IN THE FOLLOWING
CALIBRATION PROBLEMS**

(There will be a list of calibration formulas similar to this for you to refer to while taking the exam.)

$$\text{GPA} = \frac{43,560 \times \text{Gallons Used on area}}{\text{Length (FT.)} \times \text{Swath Width (FT.)}}$$

$$\text{Swath Width (FT.)} = \frac{\text{Number of Nozzles} \times \text{Nozzle Spacing (IN.)}}{12}$$

$$\text{MPH} = \frac{204}{\text{Seconds to Travel 300 Feet}}$$

$$\text{Broadcast Spraying GPA} = \frac{\text{Ounces per Minute} \times 46.4}{\text{Nozzle Spacing (IN.)} \times \text{MPH}}$$

$$\text{Band Spraying GPA} = \frac{\text{Ounces per Minute} \times 46.4}{\text{Bandwidth (IN.)} \times \text{MPH}}$$

$$\frac{\text{Pounds Active Ingredient Per Acre}}{\text{Percent Active Ingredient}} = \text{Pounds of Pesticide Product per Acre}$$

$$\frac{\text{Pounds Active Ingredient per Acre}}{\text{Pounds per Gallon}} = \text{Gallons of Pesticide Product per Acre}$$

$$\frac{\text{Gallons in tank}}{\text{gallons sprayed per acre}} = \text{acres sprayed per tank}$$

$$\text{purchased material to put in tank} = \text{Acres tank will treat} \times \text{Purchased material per acre}$$

CALIBRATION PRACTICE PROBLEMS

These problems are from the **study manual** but the format is similar to the Exam problems.

- 1-1. Calculate the swath width in feet (FT.) if the spray equipment has 13 nozzles on 20 inch (IN.) spacings. (page 32)

- 1-2. What will the application rate be in gallons per acre (GPA) if 6.5 gallons are used to treat an area 660 feet long and 21.7 feet wide? (page 32-33)

- 1-3. If an applicators spray equipment travels 300 feet in 51 seconds, what is the speed in miles per hour (MPH)? (page 33-34)

- 1-4. How many gallons per acre (GPA) (**broadcast rate**) is applied by a spray rig that travels at 4 miles per hour (MPH), delivers 35 ounces per minute, and has a nozzle spacing of 20 inches (IN.)? (page 34)

- 1-5. How many gallons per acre (GPA) (**broadcast rate**) is applied **while banding** by a spray rig that travels at 4 miles per hour (MPH), delivers 31 ounces per minute, and is treating a bandwidth of 12 inches (IN.)? (page 34) (NOTE: Although this is the amount that would be broadcast on 1 acre of treated area a greater number of acres of crop would be treated because of the alternating bands and skips. The number of acres of crop depends on the row spacing and the band width. For example if the row width is 36 inches and the band treated is 12 inches there would be 3 acres of crop for every 1 acre of surface actually treated.)

- 1-6. If the label on a 50% wettable powder states; use 1.0 pounds of active ingredient per acre, how many pounds of the product are needed to treat one acre? (page 35-36)
- 1-7. If a pesticide formulation contains 4 pounds of active ingredient (a.i.) per gallon and you want to apply 2.0 pounds of active ingredient per acre, how many gallons of the product are needed to treat one acre? (page 36-37)
- 1-8. For a spray rig that delivers 25 gallons per acre (GPA) and has a 200 gallon tank, how many gallons of a 4 pounds ai per gallon pesticide must be added to each tank at a rate of 2 pound ai per acre? (page 36)
- 1-9. For a spray rig that delivers 25 gallons per acre (GPA) and has a 200 gallon tank, how many pounds of a 50 % purchased pesticide must be added to each tank at a rate of 1 pound ai per acre? (page 37)

ANSWERS:

1. 21.7 feet
2. 19.8 gallons per acre (GPA)
3. 4 miles per hour (MPH)
4. 20.3 gallons per acre (GPA) (while making a broadcast application)
5. 30.0 gallons per acre (GPA) (while banding i.e. actually treating 1 acre but covering more acres of crop.
6. 2 pounds
7. 0.50 gallons per acre
8. 4 gallons
9. 16 pounds

CALIBRATION PRACTICE PROBLEM SOLUTIONS

These problems are from the study manual but the format is similar to the Exam problems.

- 1-1. Calculate the swath width in feet (FT.) if the spray equipment has **13 nozzles** on **20 inch (IN.)** spacings. (page 32)

$$\text{Swath Width (FT.)} = \frac{\text{Number of Nozzles} \times \text{Nozzle Spacing (IN.)}}{12} =$$

$$\frac{13 \text{ nozzles} \times 20 \text{ inches}}{12} = \frac{260}{12} = \mathbf{21.7}$$

- 1-2. What will the application rate be in gallons per acre (GPA) if **6.5 gallons** are used to treat an area **660 feet** long and **21.7 feet wide**? (page 32-33)

$$\text{GPA} = \frac{43,560 \times \text{Gallons Used on area}}{\text{Length (FT.)} \times \text{Swath Width (FT.)}} = \frac{43,560 \times 6.5}{660 \times 21.7} = \mathbf{19.8}$$

- 1-3. If an applicators spray equipment travels **300 feet** in **51 seconds**, what is the speed in miles per hour (MPH)? (page 33-34)

$$\text{MPH} = \frac{204}{\text{Seconds to travel 300 Feet}} = \frac{204}{51} = \mathbf{4.0}$$

- 1-4. How many gallons per acre (GPA) (broadcast rate) is applied by a spray rig that travels at **4 miles per hour (MPH)**, delivers **35 ounces per minute**, and has a nozzle spacing of **20 inches (IN.)**? (page 34)

$$\text{Broadcast Spraying GPA} = \frac{\text{Ounces per Minute} \times 46.4}{\text{Nozzle Spacing (IN.)} \times \text{MPH}} = \frac{35 \times 46.4}{20 \times 4} =$$

$$\frac{1624}{80} = \mathbf{20.3}$$

- 1-5. How many gallons per acre (GPA) (broadcast rate) is applied **while banding** by a spray rig that travels at 4 miles per hour (MPH), delivers 31 ounces per minute, and is treating a bandwidth of 12 inches (IN.)? (page 34)

$$\text{Band Spraying GPA} = \frac{\text{Ounces per Minute} \times 46.4}{\text{Bandwidth (IN.)} \times \text{MPH}} = \frac{31 \times 46.4}{12 \times 4} =$$

$$\frac{1,438.4}{48} = 30.0$$

- 1-6. If the label on a 50 % wettable powder states; use 1.0 pounds of active ingredient per acre, how many pounds of the product are needed to treat one acre? (page 35)

$$\text{Pounds of Pesticide Product per Acre} = \frac{\text{Pounds Active Ingredient Per Acre}}{\text{Percent Active Ingredient}} =$$

$$\frac{1.0}{0.50} = 2$$

- 1-7. If a pesticide formulation contains 4.0 pounds of active ingredient (a.i.) per gallon and you want to apply 2.0 pounds of active ingredient per acre, how many gallons of the product are needed to treat one acre? (page 36-37)

$$\text{Gallons of Pesticide Product per Acre} = \frac{\text{Pounds Active Ingredient per Acre}}{\text{Pounds per Gallon}} =$$

$$\frac{2.0}{4.0} = 0.50$$

- 1-8. For a spray rig that delivers **25 gallons per acre (GPA)** and has a **200 gallon tank**, how many gallons of a **4 pounds ai per gallon pesticide** must be added to each tank at a rate of **2 pound ai per acre?** (page 36-37)

$$\text{acres sprayed per tank} = \frac{\text{Gallons in tank}}{\text{gallons sprayed per acre}} = \frac{200}{25} = 8$$

$$\text{Gallons of Pesticide Product per Acre} = \frac{\text{Pounds Active Ingredient per Acre}}{\text{Pounds per Gallon}} = \frac{2}{4} = 0.5$$

$$\text{purchased material to put in tank} = \text{Acres tank will treat} \times \text{Purchased material per acre} = 8 \times 0.5 = \mathbf{4 \text{ gallons}}$$

- 1-9. For a spray rig that delivers **25 gallons per acre (GPA)** and has a **200 gallon tank**, how many pounds of a **50 % purchased pesticide** must be added to each tank at a rate of **1 pound ai per acre?** (page 35 & 37)

$$\text{acres sprayed per tank} = \frac{\text{Gallons in tank}}{\text{gallons sprayed per acre}} = \frac{200}{25} = 8$$

$$\text{Pounds of Pesticide Product per Acre} = \frac{\text{Pounds Active Ingredient Per Acre}}{\text{Percent Active Ingredient}} = \frac{1.0}{0.50} = 2$$

$$\text{purchased material to put in tank} = \text{Acres tank will treat} \times \text{Purchased material per acre} = 8 \times 2 = \mathbf{16 \text{ pounds}}$$

CALIBRATION PRACTICE PROBLEMS

These problems are like the ones in the study manual but the values are different.
The format is similar to the Exam problems but the values are different.

- 2-1. Calculate the swath width in feet (FT.) if the spray equipment has 8 nozzles on 20 inch (IN.) spacings. (page 32)

- 2-2. What will the application rate be in gallons per acre (GPA) if 5.0 gallons are used to treat an area 660 feet long and 13.3 feet wide? (page 32-33)

- 2-3. If an applicators spray equipment travels 300 feet in 68 seconds, what is the speed in miles per hour (MPH)? (page 33-34)

- 2-4. How many gallons per acre (GPA) (broadcast rate) is applied by a spray rig that travels at 3 miles per hour (MPH), delivers 25 ounces per minute, and has a nozzle spacing of 20 inches (IN.)? (page 34)

- 2-5. How many gallons per acre (GPA) (broadcast rate) is applied **while banding** by a spray rig that travels at 3 miles per hour (MPH), delivers 25 ounces per minute, and is treating a bandwidth of 12 inches (IN.)? (page 34) (NOTE: Although this is the amount that would be broadcast on 1 acre of treated area a greater number of acres of crop would be treated because of the alternating bands and skips. The number of acres of crop depends on the row spacing and the band width. For example if the row width is 36 inches and the band treated is 12 inches there would be 3 acres of crop for every 1 acre of surface actually treated.)

- 2-6. If the label on a 75% wettable powder states; use 3.0 pounds of active ingredient per acre, how many pounds of the product are needed to treat one acre? (page 35-36)
- 2-7. If a pesticide formulation contains 4 pounds of active ingredient (a.i.) per gallon and you want to apply 2.0 pounds of active ingredient per acre, how many gallons of the product are needed to treat one acre? (page 36-37)
- 2-8. For a spray rig that delivers 15 gallons per acre (GPA) and has a 150 gallon tank, how many gallons of a 2 pounds ai per gallon pesticide must be added to each tank at a rate of 0.5 pound ai per acre? (page 36-37)
- 2-9. For a spray rig that delivers 20 gallons per acre (GPA) and has a 500 gallon tank, how many pounds of a 75 % purchased pesticide must be added to each tank at a rate of 1.0 pound ai per acre? (page 35 & 37)

ANSWERS:

1. 13.3 feet
2. 24.8 gallons per acre (GPA)
3. 3.0 miles per hour (MPH)
4. 19.3 gallons per acre (GPA) (while making a broadcast application)
5. 32.2 gallons per acre (GPA) (while banding i.e. actually treating 1 acre but covering more acres of crop.
6. 4.0 pounds
7. 0.25 gallons per acre
8. 2.5 gallons
9. 33.3 pounds

CALIBRATION PRACTICE PROBLEM SOLUTIONS

These problems are like the ones in the study manual but the values are different good for practice.
The format is similar to the Exam problems but the values are different.

- 2-1. Calculate the swath width in feet (FT.) if the spray equipment has **8 nozzles** on **20 inch (IN.)** spacings. (page 32)

$$\begin{aligned} \text{Swath Width (FT.)} &= \frac{\text{Number of Nozzles} \times \text{Nozzle Spacing (IN.)}}{12} = \\ \frac{8 \text{ nozzles} \times 20 \text{ inches}}{12} &= \frac{160}{12} = \mathbf{13.3} \end{aligned}$$

- 2-2. What will the application rate be in gallons per acre (GPA) if **5.0 gallons** are used to treat an area **660 feet long** and **13.3 feet wide**? (page 32-33)

$$\text{GPA} = \frac{43,560 \times \text{Gallons Used on area}}{\text{Length (FT.)} \times \text{Swath Width (FT.)}} = \frac{43,560 \times 5}{660 \times 13.3} = \mathbf{24.8}$$

- 2-3. If an applicators spray equipment travels **300 feet** in **68 seconds**, what is the speed in miles per hour (MPH)? (page 33-34)

$$\text{MPH} = \frac{204}{\text{Seconds to Travel 300 Feet}} = \frac{204}{68} = \mathbf{3.0}$$

- 2-4. How many gallons per acre (GPA) (broadcast rate) is applied by a spray rig that travels at **3 miles per hour (MPH)**, delivers **25 ounces per minute**, and has a nozzle spacing of **20 inches (IN.)**? (page 34)

$$\begin{aligned} \text{Broadcast Spraying GPA} &= \frac{\text{Ounces per Minute} \times 46.4}{\text{Nozzle Spacing (IN.)} \times \text{MPH}} = \frac{25 \times 46.4}{20 \times 3} = \\ \frac{1160}{60} &= \mathbf{19.3} \end{aligned}$$

- 2-5. How many gallons per acre (GPA) (broadcast rate) is applied **while banding** by a spray rig that travels at 3 miles per hour (MPH), delivers 25 ounces per minute, and is treating a bandwidth of 12 inches (IN.)? (page 34)

$$\text{Band Spraying GPA} = \frac{\text{Ounces per Minute} \times 46.4}{\text{Bandwidth (IN.)} \times \text{MPH}} = \frac{25 \times 46.4}{12 \times 3} =$$

$$\frac{1,160}{36} = 32.2$$

- 2-6. If the label on a **75 %** wettable powder states; use **3.0** pounds of active ingredient per acre, how many pounds of the product are needed to treat one acre? (page 35-36)

$$\text{Pounds of Pesticide Product per Acre} = \frac{\text{Pounds Active Ingredient Per Acre}}{\text{Percent Active Ingredient}} =$$

$$\frac{3.0}{0.75} = 4$$

- 2-7. If a pesticide formulation contains **8.0** pounds of active ingredient (a.i.) per gallon and you want to apply **2.0** pounds of active ingredient per acre, how many gallons of the product are needed to treat one acre? (page 36-37)

$$\text{Gallons of Pesticide Product per Acre} = \frac{\text{Pounds Active Ingredient per Acre}}{\text{Pounds per Gallon}} =$$

$$\frac{2.0}{8.0} = 0.25$$

- 2-8. For a spray rig that delivers **15 gallons per acre (GPA)** and has a **150 gallon tank**, how many gallons of a **2 pounds ai per gallon** pesticide must be added to each tank at a rate of **0.5 pound ai per acre?**
(page 36-37)

$$\text{acres sprayed per tank} = \frac{\text{Gallons in tank}}{\text{gallons sprayed per acre}} = \frac{150}{15} = 10$$

$$\frac{\text{Pounds Active Ingredient per Acre}}{\text{Pounds per Gallon}} = \frac{\text{Gallons of Pesticide}}{\text{Product per Acre}} = \frac{0.5}{2} = 0.25$$

$$\text{purchased material to put in tank} = \text{Acres tank will treat} \times \text{Purchased material per acre} = 10 \times 0.25 = \mathbf{2.5 \text{ gallons}}$$

- 2-9. For a spray rig that delivers **20 gallons per acre (GPA)** and has a **500 gallon tank**, how many pounds of a **75 %** purchased pesticide must be added to each tank at a rate of **1.0 pound ai per acre?** (page 36-37)

$$\text{acres sprayed per tank} = \frac{\text{Gallons in tank}}{\text{gallons sprayed per acre}} = \frac{500}{20} = 25$$

$$\frac{\text{Pounds of Pesticide}}{\text{Product per Acre}} = \frac{\text{Pounds Active Ingredient Per Acre}}{\text{Percent Active Ingredient}} = \frac{1.0}{0.75} = 1.33$$

$$\text{purchased material to put in tank} = \text{Acres tank will treat} \times \text{Purchased material per acre} = 25 \times 1.33 = \mathbf{33.3 \text{ pounds}}$$

A Checklist for Accident Prevention

Store your pesticides safely!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you have a separate space to store pesticides? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you keep the space locked? Are the windows locked, barred or boarded over? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you keep all your pesticides in this storage rather than in the garage, feed room, basement, porch, kitchen or refrigerator? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you store herbicides separately from other pesticides? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are there signs on your storage to warn fire fighters and others? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you check periodically for leaking containers? |

Keep the original container so the label is there!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you always keep pesticides in the original container, not in old bottles, milk cartons or other food containers? |
| <input type="checkbox"/> | <input type="checkbox"/> | When people ask you for a little spray mix out of your tank do you refuse? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you always mark what you put in an unlabeled container? |
| <input type="checkbox"/> | <input type="checkbox"/> | If using an unlabeled container, do you always attach the safety precautions, antidotes and directions for use? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you safely dispose of unlabeled pesticides, rather than take a chance with your memory? |

Use recommended clothing and protective equipment!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you read the label to see what protective clothing to wear? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you start each spraying day with clean spray clothing? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you check the signal words and precautions on the label to see what protective equipment is necessary? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you wear the protective equipment recommended on the label? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you clean and maintain your protective equipment regularly and often? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you throwaway rubber gloves that have tiny holes in them? |

Spills and splashes of concentrates can be very hazardous!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you know what to do if you spill a pesticide on yourself while mixing? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you wear adequate footgear, with your pant cuffs on the outside, so pesticides won't run into your footgear? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you have sawdust, vermiculite, kitty litter or some other absorbent on hand to soak up spills? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you always watch your sprayer tank when filling so it won't run over and spill on the ground? |

- Do you have a check valve or other device on your equipment to prevent back-siphoning into the water supply?
- Is your application equipment maintained well so it doesn't leak and leave toxic puddles or piles of pesticide on the ground?
- Do you avoid draining leftover spray mix on the ground?
- Do you discard old high-pressure hose instead of patching it and hoping no one will be nearby when it bursts?
- Do you clean nozzles with a brush, or by rinsing, instead of blowing them out with your mouth?

Poor container disposal may cause serious accidents!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you rinse each "empty" liquid container at least three times and dump the rinsewater into the tank? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you keep used containers in your storage area until disposal? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you collect containers for disposal before leaving a job, instead of leaving them in the field or at your tank filling station? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you puncture, break or crush nonburnable containers so they can't be reused? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you keep or return to the manufacturer 30- and 55-gallon pesticide drums, rather than giving them away for floats, trash barrels, etc. ? |

Attractive nuisances can result in lawsuits!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you keep spray equipment where children cannot play on it? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you keep spray equipment clean so anyone who touches it will not be contaminated? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you always release pressure on your equipment so spray guns won't be accidentally triggered? . |

Care in application prevents accidents!

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you check the wind direction and the area downwind before applying pesticides? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you consider substituting a safer chemical if you are spraying near a sensitive area? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you check for the possibility of rain showers and damaging runoff before applying pesticides? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you plan your pesticide application so it will have little or no effect on bees, birds, fish or other wildlife? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you remove, turn over or cover up pet dishes, sand boxes, plastic pools, etc., before spraying a private property? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you make sure that children and pets are out of the area and stay out until the spray dries? |

Using Pesticides - Private Applicator Certification Training

Note-Taking Worksheet

Answers to these questions may be found in the Training Video, Private Applicator Manual (B-1648), and the Laws & Regulations Manual (B-5056).

I. Integrated Pest Management in Agriculture (video)

A. Defining IPM

1. IPM is a pest _____ management system that anticipates and prevents pests from causing damage.
2. IPM is an _____ approach to pest control.

B. Components of IPM

1. Pest _____
2. _____
3. Use of natural enemies (_____ control)
4. Pest - _____ plants
5. _____ and structural changes
6. Judicious use of _____ - toxic pesticides

C. Intent of IPM

1. To use tactics that are pesticide _____ that reduce the total amount of pesticide chemicals used thereby lessening the opportunity for pests to develop resistance.

II. Laws and Regulations (Chapter 1, pgs. 1-4 and Laws and Regulations Manual). Some of these questions may be repeated in the section where they best apply.

1. How is a pesticide defined by law? (L&R §76.001 definitions)
2. Which state and federal agencies register pesticides? (L&R §76.001 definitions)
3. What is the federal law that regulates the sale and use of pesticides? (L&R §76.001 definitions)
4. What is a state-limited-use pesticide? (L&R §76.003)
5. As defined by law, what is a private pesticide applicator? (L&R §76.112)
6. When supervising pesticide use, must the private applicator be physically present? Is the applicator responsible for actions of the supervised workers? (L&R §7.31)
7. Who is responsible for assuring that any person working under the licensee's direct supervision is knowledgeable of the label requirements and rules and regulations governing the use of the particular pesticide being used by the individual? (L&R §7.31)
8. What practical knowledge and skills should a private applicator have? (video)
9. What is the significance of pesticide label directions with regard to the law? (L&R §7.71)
10. What types of laws are violated when the applicator uses pesticides inconsistent with label directions? Examples: Is it ever legal to use more than the labeled rate? Is it ever legal to allow the pesticide to DRIFT off of the target site? (L&R §7.71)
11. What role do Texas counties have in regulating pesticides? (L&R §7.50)
12. What is a spray permit? (L&R §7.50)
13. When does a spray permit expire? (L&R §7.50)
14. List some applications that would require a spray permit and some that would not require a spray permit and some that are prohibited from having a spray permit. (L&R §7.50)

15. What Continuing Education Units (CEUs) are required to renew the private applicator's license? (L&R §7.24)
16. What late fees are added to the renewal fee if a private applicator does not renew the license by February 28th? (L&R §7.25)
17. If an applicator fails to inform TDA of a change in mailing address, what can happen to the license? (L&W §7.20)
18. When can a person request prior notification? (L&R §7.37)
19. Name an accepted method of giving prior notification of a scheduled application to a neighbor who has requested prior notification. (L&R §7.37)
20. How long are licensed pesticide applicators required to keep records? What types of pesticides are required to be included in these records? (L&R §7.33)
21. Explain what is needed when the regulations require that the **total volume** of spray mix, dust, granules, or other materials applied per unit be recorded. (L&R §7.33) Give an example of what is meant here.
22. List locations that are covered by WPS and others that are exempt. (L&R WPS - 40 CFR, Subpart A, §170.1).
23. Compare the terms "Agricultural Employer" and "Handler Employer" as used in the WPS. (L&R WPS - 40 CFR, Subpart A, §170.3).
24. What is an agricultural employer? (L&R WPS - 40 CFR, Subpart A, §170.3).
25. How often is a supervisor required to monitor a handler who is using a highly toxic pesticide marked with a skull and cross bones and how can they be monitored? (L&R WPS - 40 CFR, Subpart C, §170.210).
26. What items are necessary at the decontamination site(s) and who is responsible for providing these items? (L&R WPS - 40 CFR, Subpart C, §170.250).

Some of the above questions may be repeated in a later section due to specific subject matter.

III. How to Read Pesticide Labels (video, Labels and Labeling, Chapter 2, pgs. 5-10)

1. Look for the _____ name on the front of the label
2. _____ ingredients are the ones that kill or control the pests.
3. _____ words tell you how poisonous the pesticide is.
CAUTION: least poisonous pesticides - low toxicity
WARNING : more poisonous or irritating - moderately toxic
_____: very poisonous or irritating; **MAY** also have skull and crossbones - very toxic
4. When handling pesticides with the **DANGER** signal word, someone should check on you _____ every hours . (video and L&R WPS - 40 CFR §170.210)
5. The _____ statements section tells you which parts of your body need special protection and what kind of personal protective equipment to wear.
6. The _____ hazards section tells you if you must take extra care to protect bees and wildlife or to keep the pesticide out of groundwater and surface water.
7. A _____ is classified as restricted use by EPA because it may, without additional regulatory restrictions, cause unreasonable adverse effects to the environment or to human health (including injury to the applicator). Labels say for sale to and for use by certified applicators or persons under their direct supervision and only for uses covered by the Licensed Applicator's license.
8. The _____ for use section lists information on mixing, loading and application.
9. All agricultural pesticides have a restricted _____ interval (REI). The REI is the time immediately after a pesticide application when entry into the treated area is limited. (WPS - 40 CFR, Subpart A, §170.3)
10. The _____ interval is the number of days between when the pesticide is applied and when the crop is harvested.

11. Using a little MORE pesticide than the label recommends is _____ legal since it is a use inconsistent with label directions. (L&R §7.71 - Use Inconsistent with Label Directions)
12. The label _____ allows drift off of the intended spray target. (L&R §7.71 - Use Inconsistent with Label Directions)

Groundwater (Chapter 3, pgs. 11-15)

1. What are some consequences of groundwater contamination?
2. List some routes by which pesticides may reach groundwater.
3. What site features contribute to a greater potential for chemical movement through soil?
4. What chemical and physical properties contribute to a pesticide's potential for leaching?
5. What pesticide application practices help minimize the potential for groundwater contamination?
6. List some ways to minimize direct contamination of groundwater
7. How can back-siphoning be prevented?
8. What procedures should be used to clean out pesticide containers?

V. Endangered Species Protection (Chapter 4, pgs. 17-19)

1. What are the benefits of biological diversity?
2. What is an endangered species?
3. What responsibility does the Environmental Protection Agency have with regard to endangered species protection?

4. How can the label help protect endangered species?
5. Name two government agencies that can provide information on endangered species.

VI. Pesticide Record-Keeping (video; also refer to RULE §7.33 - - - Records of Application)

- A. The 1990 Farm Bill and subsequent amendments require you to record basic information about a pesticide application. The required information includes:
1. applicator _____ and certification/license number
 2. the _____, day and year of application
 3. product or brand name and EPA _____ number
 4. total amount applied of _____ pesticide
 5. _____, commodity, stored product or site that received the application
 6. the _____ of the area treated, in acres, number of trees or other measurement
 7. the location of application (using maps, county field numbers or legal descriptions so that the exact area can be identified _____ years later if requested)
- B. If you make a _____ application to an area that is less than 1/10th of an acre over a 24-hour period, then you only need to record:
1. date of application
 2. brand or product name
 3. EPA registration number
 4. total amount applied
 5. the location (designated as spot application, followed with short description)
- C. Greenhouse and _____ applications are not considered spot application and therefore do NOT qualify for the shorter list of required data.
- D. Records must be recorded within _____ days of the application and then kept for _____ years.
- E. The regs require that the **total volume** of spray mix, dust, granules, or other materials applied per unit be recorded - Give an example of what is meant here.

VII. Personal Protection and Proper Use (video and Chapter 5, *Pesticide Safety*, pgs. 21-24)

A. Protecting Yourself from Pesticides

1. When handling pesticides, watch out for spills and splashes. Avoid sprays and dusts from pesticide applications. Also avoid _____, which are pesticides that remain on the plants, soil, water, equipment, clothing or in the air after an application.
2. Pesticides can poison or injure you if you: swallow or _____ them, get them into your eyes or on your _____.
3. The most common route for pesticides to enter the body during use is through the _____.
4. Applicators are more likely to receive high levels of skin exposure when they are _____ and _____.
5. Signs and symptoms of organophosphate poisoning include: _____, _____, _____, _____, _____, _____.

B. Personal Protective Equipment (PPE)

1. Chemical-resistant PPE can be made of a variety of chemical-resistant material, including PVC and _____.
2. Gloves that are made of _____ and leather should NOT be worn when handling pesticides.

C. Follow these easy rules for wearing PPE correctly:

1. Keep pant legs _____ the top of boots.
2. Wear chemical-resistant _____ that reach at least half-way to the elbow.
3. If applying pesticides toward the ground, wear sleeves over the _____ of gloves.
4. If working above your shoulders, wear sleeves _____ your gloves. Make sure you choose gloves with cuffs.

5. Wear _____ over your regular work clothes to give your body good protection against most pesticides.
6. Use a chemical-resistant _____ to keep splashes and spills from soaking your coveralls while you are mixing and loading pesticides or cleaning equipment.

D. Respirators (best protection against gases and vapors)

1. The National Institute for Occupational Safety and Health (_____) is the federal agency that evaluates and approves _____. In addition, since 1998, the Occupational Safety Health Administration (OSHA) requires that before employees can use respiratory protection equipment they must be trained and have a medical evaluation. Before you put on a respirator, double check to make sure that the number on the respirator matches the number listed on the product label.
2. Styles of respirators include:
 - _____ - _____ filtering respirators
 - Chemical _____ respirators
 - _____ respirators
 - Air - _____ or self-contained breathing apparatus (when using highly toxic pesticides or during fumigation)
3. Every time you put your respirator on, make sure that you do a _____ check.
4. If there are no instructions, then replace filters, cartridges and canisters at the end of each work day, or after _____ hours whichever comes first.
5. When and how should the respirator face piece be cleaned?

E. Transporting and Storing Pesticides

F. Mixing and Loading Pesticides

G. Cleaning Up Pesticide Spills - - The three "C"s of spill management:

1. _____
2. _____
3. _____

H. Cleaning and Disposing of Pesticides and Pesticide Containers

I. Applying Pesticides

J. Cleaning Up. When washing contaminated work clothes, follow these washing procedures:

1. Keep work clothes _____ from other laundry .
2. Wash only a few items at a time.
3. Use the _____ water level.
4. Use heavy-duty detergent and _____ water .
5. Use _____ rinse cycles and use warm water if possible.
6. Use two complete washer cycles for items moderately to heavily contaminated.
7. Hang washed work clothes _____ .
8. Run washer without clothes for _____ additional cycle using hot water and detergent to clean machine.
9. Try NOT to use _____ ; or use highest setting.

When clothing is heavily contaminated it should be _____ .

Environmental Considerations (Chapter 6, pgs. 25-26; L&R §7.34; and pesticide label.)

1. Empty pesticide containers should be triple rinsed prior to disposal, what should the applicator do with the rinse water from the triple rinsing? (page 26, paragraph 6; §7.34; storage and disposal language from the pesticide label)
2. What can be done with empty, rinsed, pesticide containers? (L&R §7.34; storage and disposal language from the pesticide label)

VIII. The Worker Protection Standard (video, L&R 40 CFR §170)

1. To conduct training, you must use: _____ or audio-visual training materials (EPA-approved).
2. You can deliver the information yourself or rely on _____ - _____ programs (or enlist another approved trainer).
3. The training must be presented so that it can be _____ by the workers: use trainee's language, use nontechnical terms, respond to questions.
4. List locations that are covered by WPS and others that are exempt. (WPS - L&R 40 CFR, Subpart A, §170.1).

5. Compare the terms “Agricultural Employer” and “Handler Employer” as used in WPS. (WPS - L&R 40 CFR, Subpart A, §170.3).
6. The _____ is the person ultimately responsible for insuring worker compliance with WPS restricted entry intervals before entering treated fields. (WPS - L&R 40 CFR, Subpart A, §170.3).
7. How often is a supervisor required to monitor a handler who is using a highly toxic pesticide marked with a skull and cross bones and how can they be monitored? (WPS - L&R 40 CFR Subpart C §170.210).
8. What items are necessary at the decontamination site(s) and who is responsible for providing these items? (WPS - L&R 40 CFR Subpart C §170.250).

IX. Application, Equipment, and Calibration (Chapter 7 pgs. 29-40 and video)

1. Rank the roller, centrifugal and piston pumps in order from lowest to highest pressure. Which has the highest volume capacity?
2. When considering pump size, what capacity should a pump have?
3. What guideline should you follow for selecting a pressure gauge?
4. What kind of nozzle tip should be avoided when spraying wettable powders?
5. With flat spray tips, what must be adjusted to change the amount of overlap in spray pattern?
6. Which spray tips can be used at an operating pressure of 20 to 40 pounds per square inch?
7. You can change the output of any nozzle by changing the operating **pressure** . Changing pressure is only good for small changes; for larger changes it is best to change the nozzle tips to deliver the correct volume.
8. To double nozzle flow rate (without changing the nozzle), you must increase pressure **four (4)** times. (This is NOT a practical thing to do. For example if you are using 30 psi you would have to increase pressure to 120 psi and nozzle tips generally are designed to work best at pressures between 20 and 40 psi.)

9. What kind of material should be used to clean nozzles?
10. What is a specific precaution you should take to prevent drift related to wind?
11. What hours of the day are usually best for spray applications?
12. How often should equipment be calibrated?
13. What material should be used in the tank to check nozzle discharge or calibrate a sprayer?
14. When should a nozzle tip be replaced?
15. What kind of application method has a rate per acre of land that is different from its rate per treated acre?
16. How is swath width in feet determined when broadcast spraying? when band spraying?
17. What does the formula for GPA enable you to determine?

Calibration Problems: Practice working calibration problems on separate work sheet.

X. Pests and Pest Damage (manual, Chapters 8-14, pgs. 41-78, video)

Pest and Pest Damage - Introduction and Insect Pests - pgs. 41-46

- 8-1. What is the first step in managing a pest problem?
- 8-2. What is the difference between an insect that undergoes NO metamorphosis (like silverfish) and an insect that undergoes COMPLETE metamorphosis (like butterflies)?
- 8-3. What do all adult insects have in common? - Name six examples of types of insects:

- 8-4. What differences exist between insects and the group that includes mites, ticks and spiders?
- 8-5. Into what categories are insects grouped, according to their impact on humans? What proportion of all insects does each category contain? (pie graph).
- 8-6. Natural processes control _____ of potential damage caused by insects.
- 8-7. Give examples of natural factors and artificial techniques that control insect pests.
- 8-8. Among insects, what are key pests, occasional pests and secondary pests?
- 8-9. Define 'economic threshold.' (note this may apply to both plants and animals.)
- 8-10. The economic threshold for greenbug (a sorghum aphid) depends on what two factors?
- 8-11. The private applicator must decide what is the pest, if or when to treat and finally, what?

Plant Disease Control - pgs.47-49

- 9-1. Without the aid of a microscope, how can plant diseases be recognized? Name three factors required for infection to occur.
- 9-2. What plant disease symptoms are indicative of blight?
- 9-3. Why are protectant fungicides used to prevent fruit rots?
- 9-4. What is the difference between powdery mildew and downy mildew?
- 9-5. What are nematodes? What potential harm can they cause to plants?
- 9-6. Besides chemical control, what methods may be used to prevent plant disease from occurring?

Weed Control - pgs. 51-58

- 10-1. Describe the life cycles of annual, biennial and perennial weeds - Give examples of each.
- 10-2. List 4 weed control methods and give examples of each.
- 10-3. How do seedling grass plants and seedling broadleaf weeds differ in the location of their growing point?
- 10-4. What kind of underground structure is found on purple nutsedge and wild onion?
- 10-5. Many perennial weeds have buds on creeping roots, rhizomes or stolons. What is necessary for a herbicide to be effective on these weeds?
- 10-6. What variation occurs in the effectiveness of herbicide for control of annual weeds during the seedling, vegetative, flowering and mature stages of growth?
- 10-7. In general, during which stage of growth should herbicides be applied for the best control of perennial weeds?
- 10-8. What is the benefit of adding a surfactant to a foliar spray mix?
- 10-9. What type of pesticide is used to control vegetation (plants)?
- 10-10. What type of soil will herbicides move through most easily?
- 10-11. When using soil-applied herbicides, why is a higher rate needed on soil that is heavy in clay and organic matter?
- 10-12. What is the effect of temperature and humidity on herbicide effectiveness?

COMMENT: As humidity increases from 0 to 100 percent, more herbicide is **absorbed** by the leaf surface. This is talking about **UPTAKE** (absorption) not activation.

Brush Control - pgs. 59-61

- 11-1. What characteristic of some brush species makes them particularly hard to control?
- 11-2. With chemical brush control, what factor should be considered in choosing between broadcast application methods and individual plant treatment?
- 11-3. How can physical spray drift from the target area be reduced during herbicide application on grasslands or croplands?

Aquatic Vegetation Control - pgs. 63-66

- 12-1. List and describe the four types of aquatic plants.
- 12-2. What is the most important factor in controlling or preventing aquatic weeds in ponds?
- 12-3. When would a granular herbicide formulation be used for aquatic weed control?
- 12-4. When calculating chemical treatment for aquatic weed control, what is the difference in treating submersed weeds rather than floating and shoreline vegetation?
- 12-5. How can you, the applicator, prevent contamination of water intended for other uses after the water leaves the treated area, when an aquatic pesticide is used?

Wildlife Damage Control - pgs. 67-76

- 13-1. What is the objective of wildlife damage control?
- 13-2. Before beginning any wildlife damage control program, what should you do?
- 13-3. Give an example of a fish that may cause problems at certain times but is also a protected game fish.
- 13-4. Give examples of nonchemical methods that could be used to control fish.
- 13-5. What is a nutria?

- 13-6. What is the first step in solving a wildlife damage problem?
- 13-7. What physical evidence contributes to proper identification of wildlife species? What would you look for if you suspected roof rats?
- 13-8. What constitutes environmental control of wildlife?
- 13-9. If an animal population must be reduced, what factors should be considered in choosing the control method?
- 13-10. When should carcasses of target animals be collected and destroyed?

Photo ID: Note that there are photos of pests and pest damage in the manual. This represents an extremely small sample of all of the possible pests that you may encounter but certain photos will be selected from this group for you to identify on the Exam. For each question a photo will be shown with 4 possible answers so it should be fairly easy if reviewed carefully before going into the Exam. Not all photos will be used.

Remember the continuing education requirements for license renewal:

**15 hours every 5 years,
with 2 in laws and regulations and 2 in IPM.**
You may take 10 hours via the internet or correspondence courses.
You must have at least 5 hours of live instruction.

Complete paperwork (Extension form D-1411 or TDA form PA-404)
You will need this to take your Exam and apply for your license.