

The background features a large green leaf in the upper right corner. On the left, there are several overlapping circles and lines in shades of blue, orange, and lime green. A central blue circle contains the main text. Other circles in orange, blue, and lime green are scattered around the central circle. Lines of various colors connect these circles, creating a network-like structure.

2023

THE ALMOND CONFERENCE

Connecting the Dots

GROWERS // HANDLERS //
CUSTOMERS // CONSUMERS

Test Prep: Private Applicator Certificate (aka the brown card)

Moderator/Speaker: Anna Genasci (Stanislaus County Farm Bureau)

Private Applicator Certificate Changes



California Department of
dpr Pesticide Regulation
Pesticide Enforcement Branch

STATE OF CALIFORNIA

PRIVATE APPLICATOR CERTIFICATE

CERTIFICATE NUMBER _____ VALID THROUGH _____

DEC.

NAME: _____

ADDRESS: _____

By: Anna Genasci, QAL & QAC
Stanislaus County Farm Bureau
Director of Education & Communication





GOT TO KNOW THE RULES

EPA – Environmental Protection Agency, Federal

DPR – Department of Pesticide Regulations, California

Ag Com – Agricultural Commissioner's Office, County

California Code of Regulations – 3CCR Food and Ag Code – F&A

Why do we use pesticides?



Why take the new exam?

- As per the new regulations, effective January 1, 2024, Individuals who are currently certified as private applicators are required to take and pass the revised initial Private Applicator Certificate (PAC) Examination to demonstrate competency with the revised private applicator standards in **40 CFR Part 171**.

Key Timelines

- **Last names beginning with 'R-Z' expire December 31, 2023:** These individuals still have the option to renew via CE hours, if they renew prior to **January 1, 2024***. Any subsequent renewals will require them to take and pass the revised examination. Individuals without CE hours must take and pass the revised examination by January 1, 2024 to maintain uninterrupted certification.
- **Last names beginning with 'A-H' expire December 31, 2024:** These individuals must take and pass the revised examination by **January 1, 2025*** to maintain uninterrupted certification.
- **Last names beginning with 'I-Q' expire December 31, 2025:** These individuals must take and pass the revised examination by **January 1, 2026*** to maintain uninterrupted certification.

- BUT Rodenticides

* Burrowing Vertebrate Pest Fumigation Certificate (BVC)

*Beginning **January 1, 2024**, a PAC holder (**regardless of the PAC expiration date**) must also possess a Burrowing Vertebrate Pest Fumigation Certificate (**in addition to the revised PAC certification**) if they plan to control burrowing pests using a restricted material labeled as a fumigant for the control of burrowing vertebrate pests (e.g., use of aluminum phosphide).



So, now what?



Study Manual for Private Applicator Certification Exam



PAC Manual,
English



PAC Manual,
Spanish



PAC Manual,
Electronic
English or Spanish

1. Pest Management
2. Pest Identification
3. Pesticides
4. Laws and Regulations
5. Environmental Hazards
6. Human Hazards
7. PPE
8. Using Pesticides Safely
9. Application Equipment
10. Calibration
11. Using Pesticides Effectively
12. Pesticide Emergencies

1. Pest Management

Integrated Pest Management

Integrated pest management (IPM) is a pest management program that uses knowledge of pest biology and extensive monitoring to understand a pest and its potential for causing economic injury. IPM combines a variety of control methods to prevent pest damage sustainably, including prevention, cultural practices, exclusion, use of natural enemies, host plant resistance, and pesticide applications. The goal is to achieve long-term pest suppression with minimal impact on people, nontarget organisms, and the environment.

- Pest prevention
- Cultural practices
- Pest exclusion
- Natural enemies
- Host plant resistance
- Pesticide applications



1. Pest Management

- **Biological Control**, use of living agents to control pests, like a ladybug eating aphids
- **Chemical Control**, use of pesticides
- **Mechanical Control**, kill the pest directly or make the environment unsuitable for it
- **Cultural Control**, practices that reduce pest establishment, like sanitation, removing weeds before they go to seed



Question Time

- CH1 –
- The term used to describe a pest that becomes a problem after the main pest is controlled is _____.
- a. an occasional pest
- b. a secondary pest
- c. a minor pest



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2. Pest Identification

Understanding Pest Biology

Before trying to control a pest, you must identify it and understand its biology. Be certain any injury or damage you see is actually caused by the pest you have identified and cannot be blamed on anything else. Once you have identified the pest and its damage, learn about its life cycle and growth, as well as the life cycle and growth of the crop or animal host. Then use this information to form your pest control plans. Misidentification, lack of information about a pest, and poor understanding of a plant's, animal's, or crop's most vulnerable growth stages could cause you to choose the wrong control method or apply the control at the wrong time. Making poor choices based on poor information is the most common cause of pest control failure.

This chapter reviews some of the ways to identify pests, and discusses the four main groups of common pests:

- weeds: unwanted plants
- invertebrates: insects, mites, and their relatives; nematodes and other microscopic worms; and snails and slugs
- vertebrates: birds, reptiles, amphibians, fish, and mammals
- pathogens: bacteria, viruses and viroids, fungi, phytoplasmas, and other microorganisms



FIGURE 2-21.

Adult pocket gophers are rarely seen above ground except when pushing soil from their burrow, as shown here, and sometimes when clipping small plants near a burrow opening.



FIGURE 2-22.

Ground squirrels are often pests because they compete with people for agricultural products. Squirrels also damage levees and bridge foundations through their burrowing activities. Some vector diseases that fleas or other insects transmit to people and livestock.

2. Pest Identification

- Identify the pest: use PCAs, CCAs, Coop Extension, Entomologist
- Life Cycle ... why is this important
- Knowledge of common pests, signs and symptoms



3. Pesticides



Explain how contact and systemic pesticides control pests differently.

- **Contact.** These pesticides work only on pests that they contact directly. For instance, weeds die when a contact herbicide covers a sufficient surface area of the plant. Only insects that are sprayed directly or have traveled across treated surfaces are affected by contact insecticides.
- **Systemic.** These pesticides work when applied to a particular area of a plant or animal. The pesticide is then translocated, or moved, throughout the organism's system. For example, a systemic herbicide applied to a plant's roots moves throughout the whole plant and kills it. Some insecticides move throughout an insect to kill it after it eats the leaves of a treated plant.

Within these general terms, modes of action become quite specific and can help you effectively

select and use a pesticide. Figure 3-2 shows the part of Atrazine 90DF's label that defines its mode of action by its numbered group. Each group number was developed by organizations such as the Insecticide,

GROUP 5 HERBICIDE

FIGURE 3-2.

Pesticide labels will have a box like this to identify the

Herbicide, and Fungicide Resistance Action Committees and the Weed Science Society of America. These organizations are discussed in more detail in Chapter 11.

3. Pesticides

Adjuvants

Adjuvants are materials you can add to the spray tank to improve pesticide mixing and application or to enhance performance. Manufacturers formulate pesticides to work well under many different application conditions. However, they cannot formulate them for all possible situations. Use adjuvants to customize the formulation to specific needs and local conditions.

Adjuvants are used in order to

- improve the wetting ability of spray solutions
- control evaporation of spray droplets
- improve weatherability of pesticides
- increase the penetration of pesticides through plant or insect cuticles
- adjust the pH of spray solutions
- improve spray droplet deposition
- increase safety to target plants
- correct incompatibility problems
- reduce spray drift

CAUTION	Slightly toxic either orally, dermally, or through inhalation; causes slight eye or skin irritation.
WARNING	Moderately toxic either orally, dermally, or through inhalation; causes moderate eye or skin irritation.
DANGER	Can cause severe eye damage or skin irritation.
DANGER-POISON	Highly toxic by any route of entry into the body.

Question Time

- CH3 - A pesticide is defined as_____.
- a. any substance used to control pests in any situation.
- b. only those chemicals register for pest control in Ca.
- c. certain pest control products derived from natural sources.



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4. Laws and Regulations

- The pesticide label, the label is the law
- SDS (16)
- Hazard Communication
- Permits
- PURs

1 RESTRICTED USE PESTICIDE
DUE TO TOXICITY TO NON-TARGET INVERTEBRATES, MAMMALS, AND AQUATIC ORGANISMS
FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION
AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

2 Knock 'em out SC
Miticide/Insecticide By ToxiK™

3 Active Ingredient:

4 Abamectin¹.....8.0%*

Other Ingredients:.....92.0%

5 Total:100.0%

6 *Knock 'em out SC Miticide/Insecticide is formulated as a suspension concentrate and contains 0.7 lb abamectin per gallon.

**7 EPA Reg. No. 123-456
EPA Est. 123-CA321
SCP 1351A-L1K 1217**

**8 Net Contents
1 quart (32 fluid ounces)**

**9 KEEP OUT OF REACH OF CHILDREN.
WARNING/AVISO**
Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

**10 Manufactured for: ToxiK™, LLC
P.O. Box 0000 Your Town, Your State, 00000**

11 FIRST AID

If swallowed:

- Call a poison control center or doctor IMMEDIATELY for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

If inhaled:

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.
- Call a poison control center or doctor for further treatment advice.

If on skin or clothing:

- Take off contaminated clothing.
- Rinse skin IMMEDIATELY with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

If in eyes:

- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.

12 PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

WARNING/AVISO

May be fatal if swallowed or inhaled. Do not breathe vapor or spray mist. Harmful if absorbed through the skin. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing. Remove and wash contaminated clothing before reuse.

Personal Protective Equipment

Applicators and other handlers must wear:








- Long-sleeve shirt and long pants
- Chemical-resistant gloves made of: barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polyvinyl chloride ≥ 14 mils, or Viton® ≥ 14 mils)
- Shoes plus socks

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. DO NOT reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls: When handlers use closed systems, enclosed

4. Laws and Regulations

- The pesticide label, the label is the law
- SDS (16)
- Hazard Communication
- Permits
- PURs

GHS Pictograms and Hazard Classes		
 Oxidizers	 Flammables Self-Reactives Pyrophorics Self-Heating Emits Flammable Gas Organic Peroxides	 Explosives Self-Reactives Organic Peroxides
 Acute Toxicity (Severe)	 Corrosives	 Gases under Pressure
 Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration Toxicity	 Environmental Toxicity	 Irritant Dermal Sensitizer Acute Toxicity (Harmful) Narcotic Effects Respiratory Tract Irritation

4. Laws and Regulations

- The pesticide label, the label is the law
- SDS (16)
- Hazard Communication
- Permits
- PURs

1. California regulations require field posting if the restricted-entry interval exceeds _____.

- a. 48 hours
- b. 24 hours
- c. 12 hours

Question Time

- CH4-
- California regulations require field posting if the restricted entry interval exceeds_____.
- a. 48 hours
- b. 24 hours
- c. 12 hours



Question Time

- CH4-
- California regulations require field posting if the restricted entry interval exceeds_____.
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- b. 24 hours
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5. Environmental Hazards

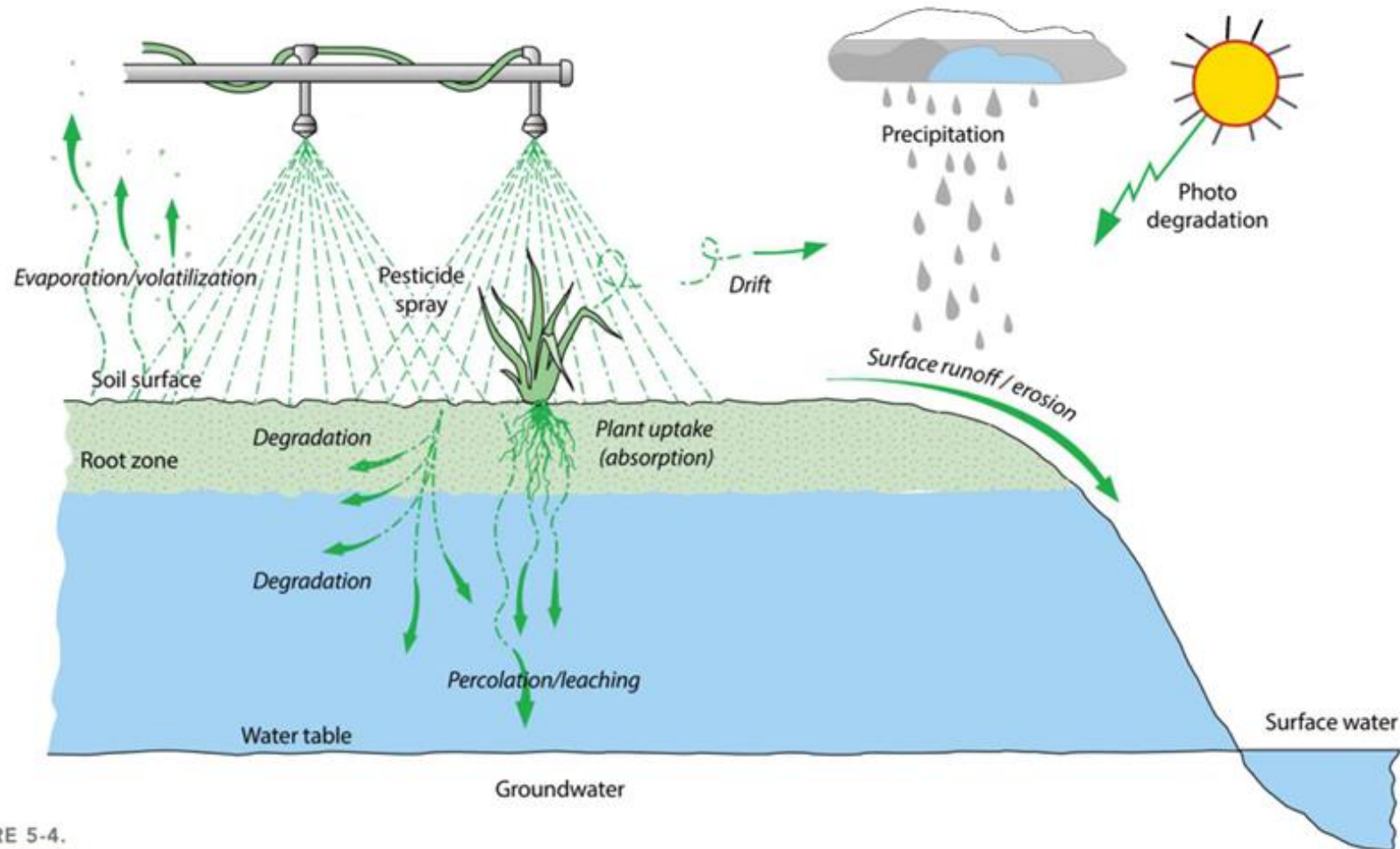


FIGURE 5-4.

The various fates of pesticides in the environment. Source: Randall 2008.

Pesticide Characteristics

- **Solubility:** Soluble pesticides are more likely to move with water in surface runoff or leaching.
- **Adsorption:** A pesticide that adsorbs to soil particles is less likely to leach.
- **Persistence:** The longer it takes pesticide to break down, the longer it stays in the environment.
- **Volatility:** The tendency of a pesticide to turn into a gas or vapor; the chance of volatilization increases as temperatures and wind increase and when relative humidity is low.



5. Environmental Hazards



FIGURE 5-9.

Pesticide wastes include partially full containers of pesticide, leftover mixtures in spray tanks, rinse water from pesticide containers, rinse water from inside and outside of spray equipment, and, as shown here, empty pesticide containers.

PROTECTION OF POLLINATORS



APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.



Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.

Bees and other insect pollinators will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

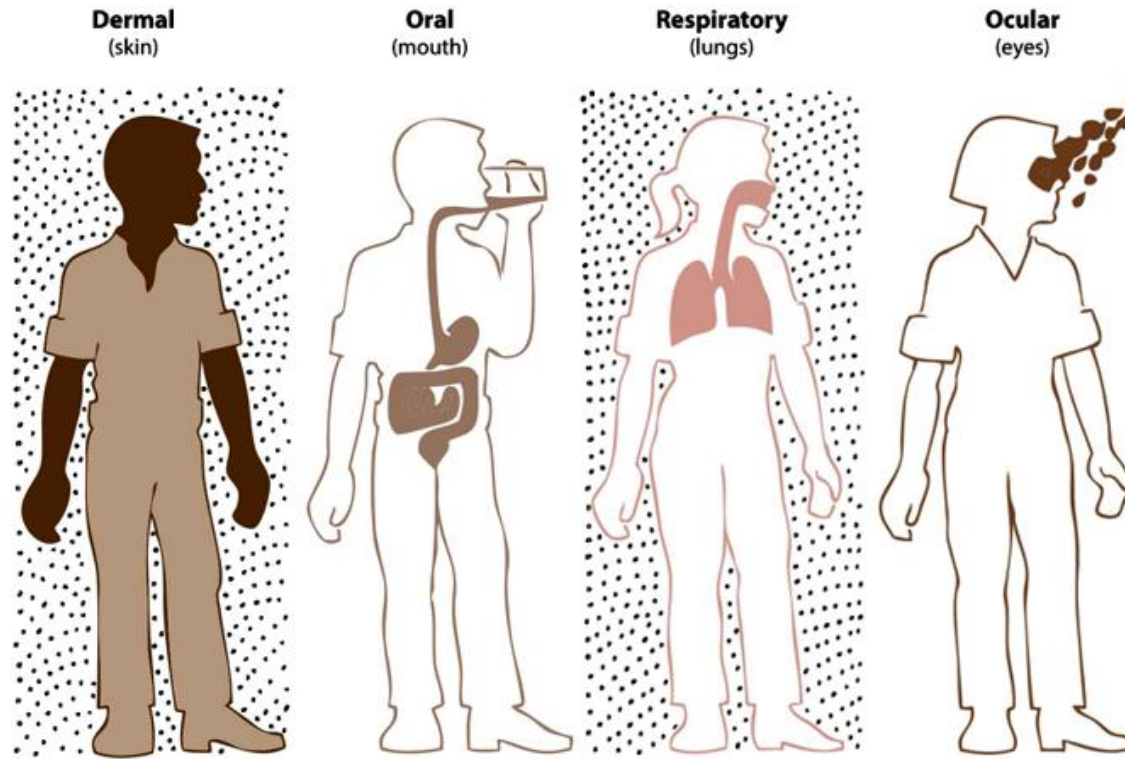
- Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives or off-site to pollinator attractive habitat can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at:

<http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx>.

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state, go to: www.aapco.org/officials.html. Pesticide incidents should also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov

6. Human Hazards



- Acute
- Chronic
- Sensitization
- Delayed

- Signs & Symptoms

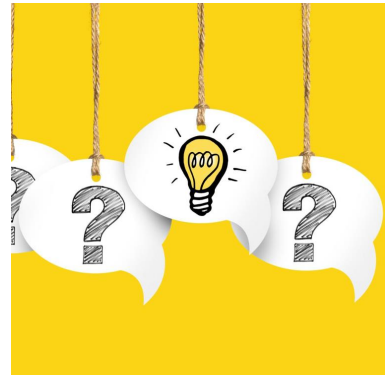
Question Time

- CH6 - The most common route of pesticide exposure is through the _____.
- a. mouth
- b. skin
- c. eye



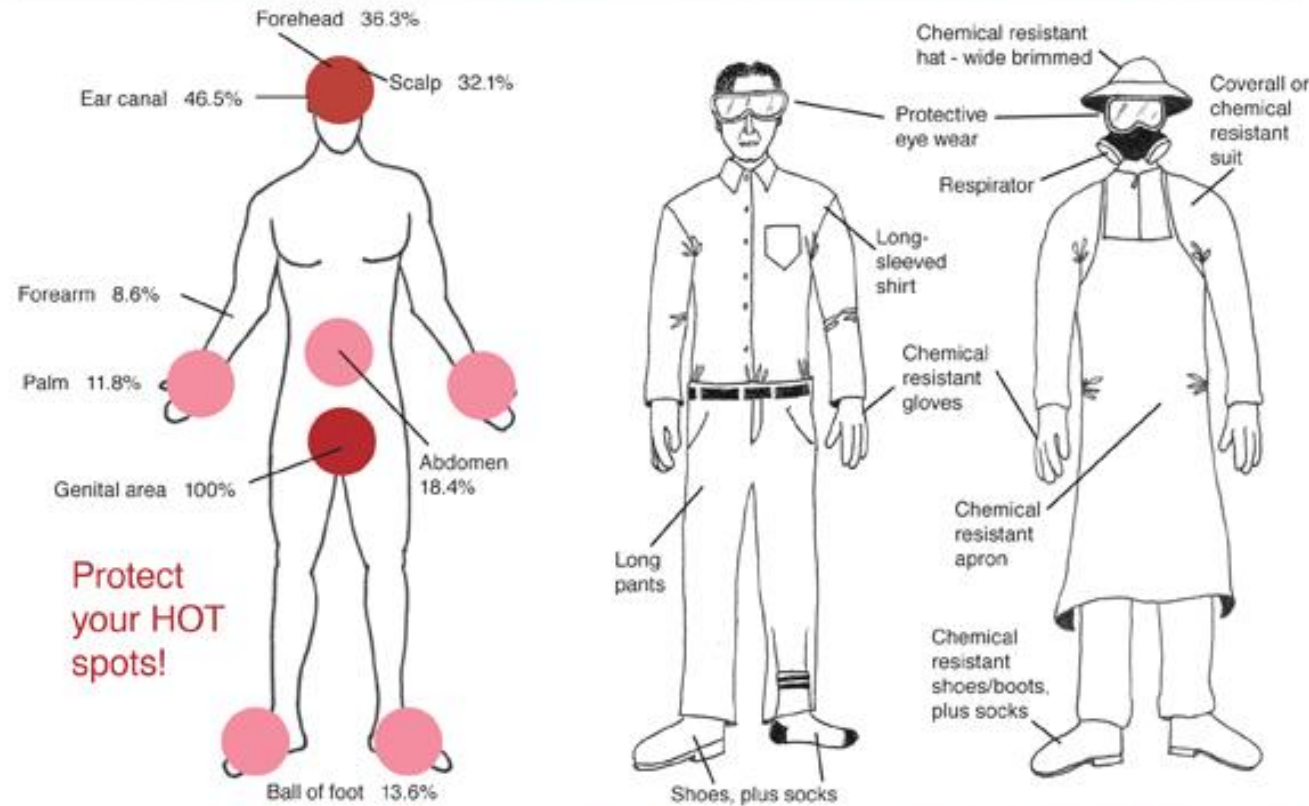
Question Time

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7. Personal Protective Equipment

Personal Protective Equipment (P.P.E.)



Protect your HOT spots!

Percents indicate relative amount of absorption of pesticide over a 24-hour period. (Feldman and Maibach, 1974. Percutaneous penetration of some pesticides and herbicides in man. *Toxicology and Applied Pharmacology* 28, pp. 399-404).

P.P.E. must be washed and dried after each day's use and stored away from chemicals. Change gloves and respirators as per manufacturers' specifications.

7. Personal Protective Equipment

- Knowing what to wear
- How to maintain it
- How to clean it
- When you need new
- Training



8. Using Pesticides Safety

- REI,
- Storing,
- Transporting,
- Mixing

SIDEBAR 8-1

CHECKLIST FOR PLANNING A PESTICIDE APPLICATION

PERSONAL

- Medical checkup and necessary blood tests?
- Properly trained for this type of application?

PESTICIDE

- Read and thoroughly understood label?
- Checked to be sure use is consistent with target pest and application area?
- Read Safety Data Sheet for information on hazards?
- Obtained necessary certifications and permits?
- Know proper rate of pesticide to be applied?

EQUIPMENT

- Proper personal protective equipment (boots, gloves, respiratory equipment, protective clothing, eye protection, head wear)?
- Necessary measuring and mixing equipment?
- Suitable application equipment for this job (tank capacity, pressure range, volume of output, nozzle size, pump compatible with formulation type)?
- Application equipment properly calibrated?
- Emergency water and first aid supplies?
- Necessary supplies to contain spills or leaks (absorbent materials, cleaning supplies, holding containers)?

TRANSPORTING

- Safe transport of pesticides to application site?
- Pesticides and containers secured from theft or unauthorized access?
- Vehicles properly marked and permits obtained, if necessary, for transporting hazardous materials and hazardous wastes?

MIXING AND LOADING

- Safe mixing and loading site located?
- Clean water available for mixing?
- Water pH tested?
- Proper adjuvants obtained for correcting pH, preventing foaming, and improving deposition?
- Compatibility of pesticide tank mixes or fertilizer-pesticide combinations checked?
- Liquid containers triple-rinsed and rinsate put into spray tank?

- Livestock, pets, honey bees, other animals properly protected?
- Location and depth of groundwater determined, if applicable?
- Hazards within treatment site identified, including electrical wires and outlets, ignition sources, obstacles, steep slopes, and other dangerous conditions?
- Plants in treatment area in proper condition for pesticide application (correct growth stage, not under moisture stress, other requirements as specified on pesticide label)?

WEATHER CONDITIONS

- Weather suitable for application (low wind, proper temperature, lack of fog or rainfall)?

APPLICATION

- Established application pattern suitable for treatment area, hazards, and prevailing weather conditions?
- Application rate will give most uniform coverage?
- Equipment frequently checked during application to ensure that everything is working properly and providing a uniform application?

CLEANUP

- Application equipment properly cleaned and decontaminated after application?
- Personal protective equipment safely stored and cleaned or laundered according to approved methods?
- Disposable materials disposed of in approved way?

DISPOSAL

- Paper pesticide containers disposed of according to local regulation?
- Plastic and metal containers triple-rinsed?
- Plastic and metal containers properly stored until properly disposed of or recycled?

STORAGE

- Storage facility suitable for pesticides?
- Unused pesticides returned to supplier or stored in locked facility for later use?

REPORTS

- Necessary reports filed with requesting agency?







Planning Applications to Ensure Safety

- **Planning for Accidents:** Emergency medical care
- **Protecting people at or near the application site:** Do not allow workers into an area being treated with a pesticide.
- **Restricted Entry Interval:** Workers are not allowed to enter treated fields during restricted-entry intervals unless they are trained as early-entry workers.
- **Posting:** Signs should be printed in English and non-English language that is understood by a majority of workers.
- **Notification:** Before applying any pesticide, you must notify all employees of the farming operation who are working within $\frac{1}{4}$ mile of the treatment area.

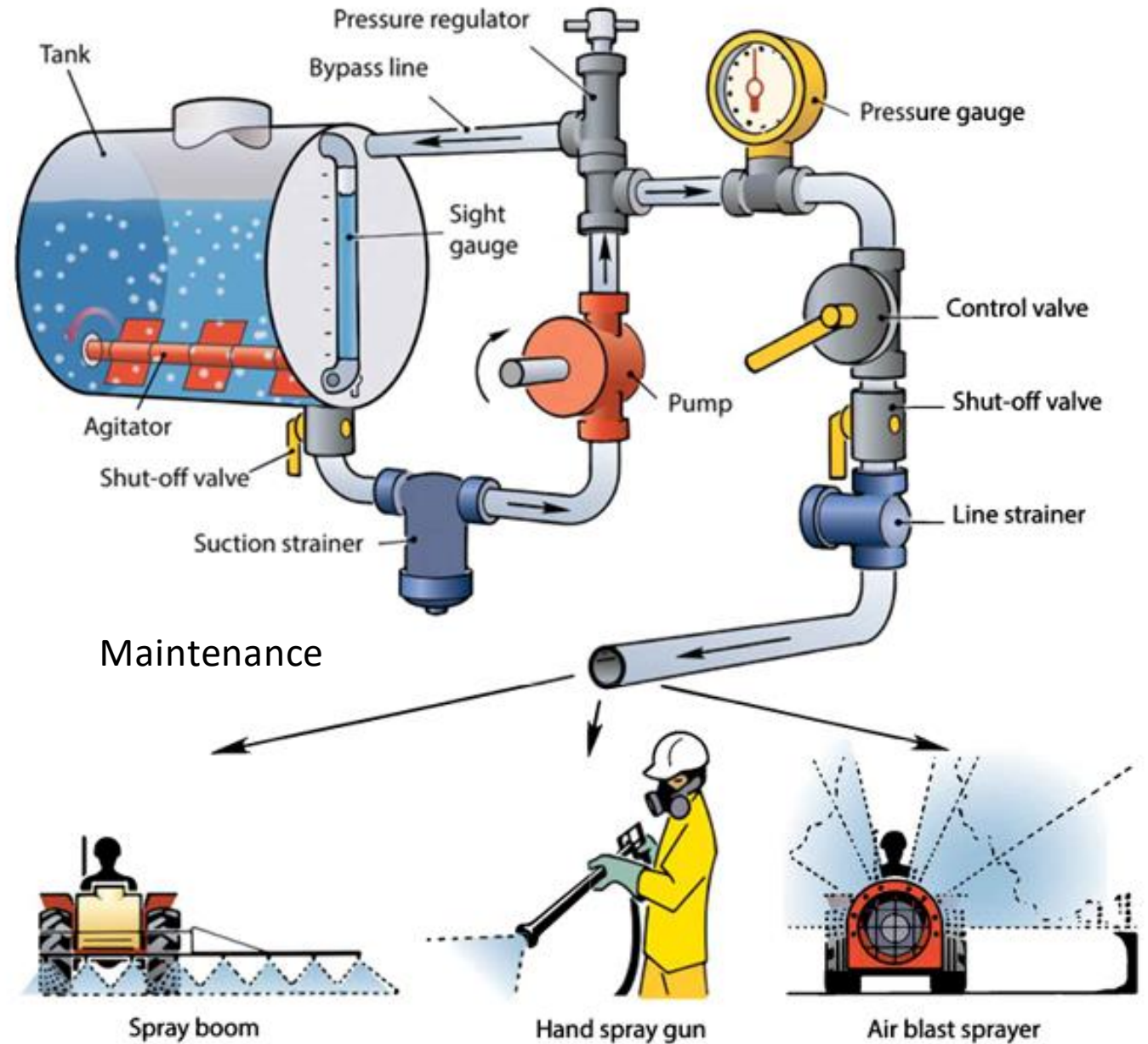


8. Using Pesticides Safety

Warning signs in English and Spanish and when to post them

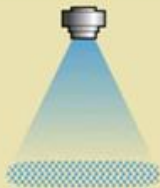
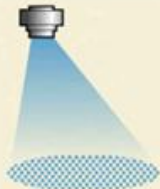



Signs	Information required	When to post
	<p>the words "danger pesticides" a skull and crossbones pictogram the words "keep out"</p>	<p>if you will apply pesticide in a greenhouse or other entirely enclosed space if you will apply pesticide in an enclosed space with an REI of more than 4 hours if the label-required REI is more than 48 hours if the label requires field posting</p>
	<p>the words "danger pesticides" a skull and crossbones pictogram the words "keep out" the name of the pesticide the name of the grower the REI expiration date</p>	<p>if the REI is more than 7 days</p>
 <p>and</p> 	<p>the words "danger pesticides" a skull and crossbones pictogram the words "keep out" the name of the pesticide the name of the grower the REI expiration date and the words "keep out" a stop sign pictogram with the word "stop" the words "pesticides in irrigation water"</p>	<p>if the REI is more than 7 days and pesticides are applied in irrigation water (chemigation)</p>
 <p>and</p> 	<p>the words "danger pesticides" a skull and crossbones pictogram the words "keep out" and the words "keep out" a stop sign pictogram with the word "stop" the words "pesticides in irrigation water"</p>	<p>if you will apply pesticide in a greenhouse or other entirely enclosed space through an irrigation system (chemigation) if you will apply pesticide in an enclosed space through an irrigation system (chemigation) and the REI is more than 4 hours if the pesticide is applied in irrigation water (chemigation) and the label requires field posting or the REI for the chemigated pesticide is more than 48 hours</p>

9. Application Equipment



9. Application Equipment

Common nozzles and their uses

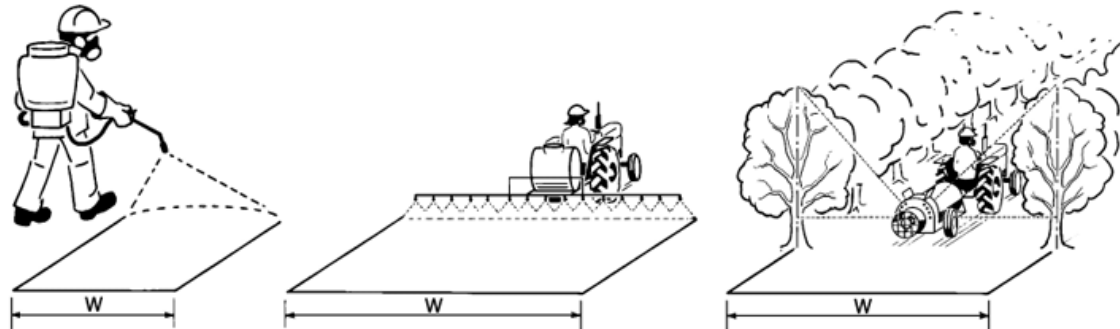
Nozzle type	Description	Spray pattern illustration	Recommended uses
Flat-fan			
even	Fan-shaped pattern with even distribution of droplets across width of fan.		Use to apply preemergence and postemergence herbicides, insecticides, and fungicides. Use at pressures of 20–40 psi; keep pressure as low as possible when spraying weeds. Use on a boom when applying separate bands of spray that should not overlap.
off-center	Fan-shaped pattern with angle to one side.		Use for herbicide applications to orchard or vineyard soil on both sides of the plant row. Use on ends of spray booms to extend the spray pattern. Use at pressures of 20–40 psi; keep pressure as low as possible when spraying weeds. Requires 100% overlap.
low-pressure	Fan-shaped pattern with fewer droplets at sides than in center of pattern.		Use to apply preemergence and postemergence herbicides, insecticides, and fungicides. Use at pressures of 20–60 psi; keep pressure as low as possible when spraying weeds. Suitable for overlapping with other nozzles to produce a wide spray swath.
extended-range (broadcast)	Wide, fan-shaped pattern ranging from fine to coarse droplets.		Use for soil and foliar applications when better coverage is required than can be gotten from flooding or turbo flooding nozzles. Best suited for use with electronic controllers that will control the spray rate either by adjusting the spray pressure or pulse width modulation. Use at pressures of 10–30 psi for soil applications and 30–60 psi for foliar applications (pressures above 25 psi can increase the likelihood of drift).
Cone			
hollow	Hollow cone pattern of fine droplets at angles ranging from 20–110 degrees.		Use to apply postemergence contact herbicides, contact fungicides, and contact insecticides in dense foliage. Often used with air blast sprayers. Use at pressures of 40–120 psi.

10. Calibration

Why Calibration Is Essential

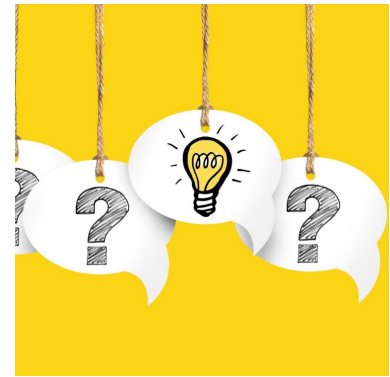
The term *calibration* refers to all the adjustments you make to be sure you apply the correct amount of pesticide to the treatment area. The main reasons for calibrating application equipment are to figure out how much pesticide to put into the tank or hopper and what the application rate should be. Calibration is necessary for

- controlling pests effectively
- protecting human health, the environment, and treated surfaces
- making efficient, effective applications
- determining spray volume
- applying pesticides at legal levels



Question Time

- CH10 - Calibration is defined as what you must do before an application to be sure that you _____.
- a. avoid hazards and sensitive areas during pesticide applications
- b. select the most effective pesticide to apply in a situation
- c. apply the correct amount of pesticide to the treatment area



Question Time

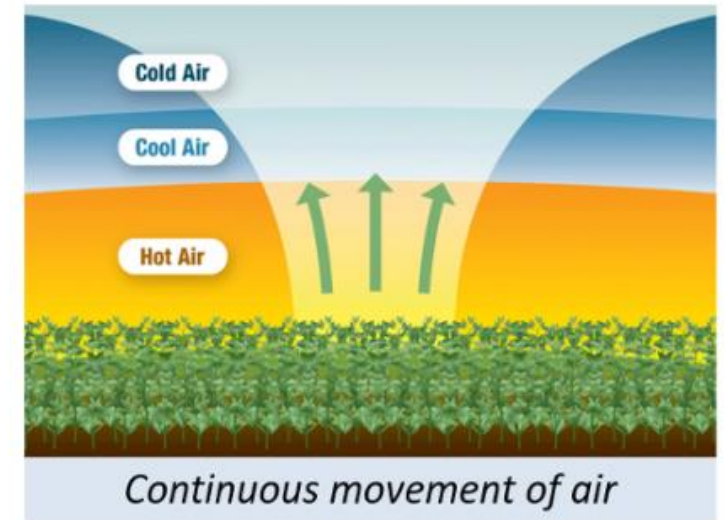
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- b. select the most effective pesticide to apply in a situation
- **c. apply the correct amount of pesticide to the treatment area**



11. Using Pesticides Effectively

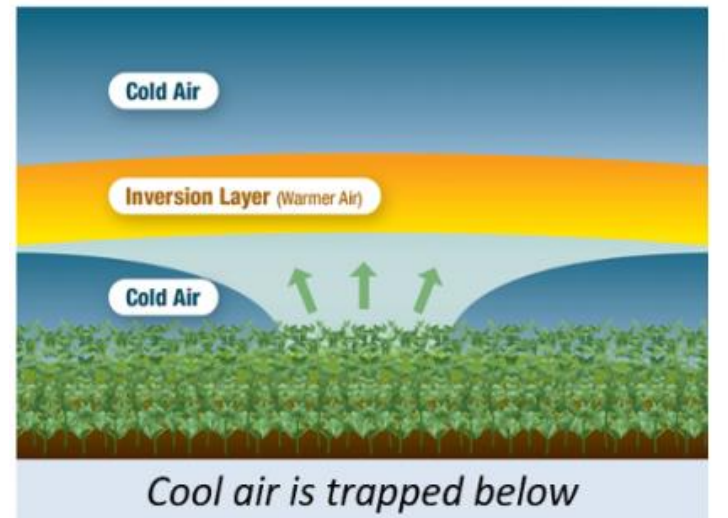
- Predicting pest problems (history)
- Making pesticide use decisions
- Choosing the right pesticide/s
- Timing (pre-harvest intervals)
- Consider weather
- Drift prevention
- Inversion Layer
- Protecting Nontarget organisms (bees)

During a typical day



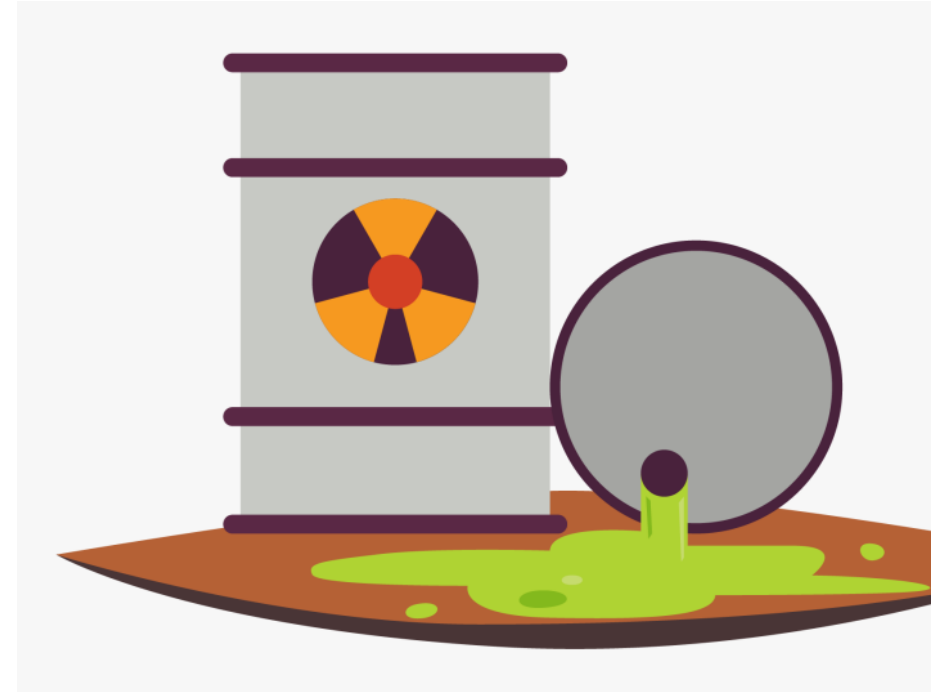
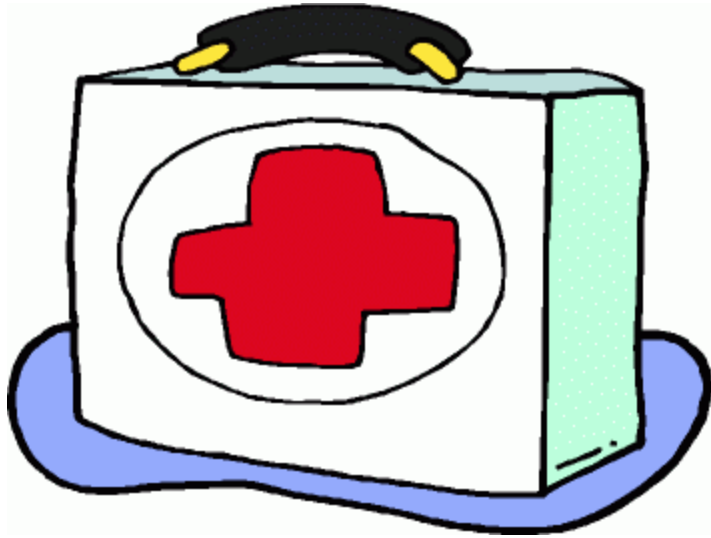
Agweb.com

With an inversion



Agweb.com

12. Pesticide Emergencies



PAPERWORK

- NOIs 24 hours in advance
- PURs, by the 10th day of the following month
- Respirator fits test, required annually
- You must first pass a medical questionnaire
- Medical posting: Emergency medical care for employees handling pesticides shall be planned for in advance.

Good news!

1. There is help!
2. Growers are passing.
3. Get some review help ... Farm Bureau Extension



Anna Genasci, QAL & QAC
Stanislaus County Farm Bureau
Director of Education & Communication
annag@stanfarmbureau.org



california
almonds[®]
Almond Board of California

Thank you

