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Good Agricultural Practices: A Best Practices Kit for Safe, Legal, and Effective Pesticide Application in Hawai'i

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Federal and state laws regulate the sale and use of pesticides in Hawai'i. They include laws affecting applicators of both conventional and "allowed" organic pesticide products. Pesticide applications are not limited to farm, greenhouse, sod and turf, nursery, commercial forest, and ranch, however. It is the legal obligation of all pesticide users, regardless of the site of application, to comply with all label instructions and with federal and state laws.

The U.S. Environmental Protection Agency (EPA) defines a pesticide as "any substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest." It includes any substance or mixture of substances intended for use as a plant growth regulator, defoliant, or desiccant. It is illegal to sell or import a pesticide product not licensed by the Hawai'i Department of Agriculture (DOA). The EPA clarified in 2013 that homemade pesticides cannot be used on any food crop unless it is only for personal or on-farm consumption. To use a pesticide legally, a user must follow all directions on the label. **THE LABEL IS THE LAW!**

The Hawai'i Department of Health (DOH) can levy fines up to $10,000 per violation if they find pesticides on a specific crop that are not allowed by the label, or pesticide levels above the Maximum Residue Limit. In addition, DOH may recall, embargo, seize, or destroy the crop and inform the media of violators. Not obeying label directions can also result in the following:

- Harm to the health of produce consumers (especially children and the elderly) – never put the desire to make money before human safety!
- Harm to non-target organisms, including, bees, birds, fish, and desirable plants.
- Harm to the environment, including ground water and soil contamination due to spills and improper application rates.
- Illegal residues on the crop.
- Pesticide applicators and handlers, farm workers, or family members becoming ill or dying.
- Public distrust of you, your business, your crop, and Hawai'i's agriculture industry.
- A warning letter or civil penalty from the DOA (fine of up to $1,000 per violation, imprisonment for not more than one year, or both).
- Federal civil/criminal penalties for shipping adulterated/contaminated (unfit for sale) produce or foods within or out of state in accordance with the Food and Drug Administration (FDA)'s Food, Drug and Cosmetic Act.

Steps for Effective Pest Control

- Identify the pest.
- Consider possible non-chemical options for reducing pest populations.
- Select an appropriate pesticide, if necessary.
- Apply pesticide according to label directions.
- Monitor results and adjust program as needed.

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Kit Content

This kit includes a number of stand-alone and interlocking pieces of information. Feel free to make copies of pages you use frequently, such as the pesticide registry and application logs.

Choosing the Proper Spray Nozzle for Effective Application

To improve the effectiveness of pesticide sprays, consider these basic issues: proper identification of the pest; crop foliage density; proper pesticide applied at the label rate; selection of sprayer equipment, including nozzle type and size; amount of spray applied to the area; uniformity of application; coverage obtained; and amount of potential spray drift.

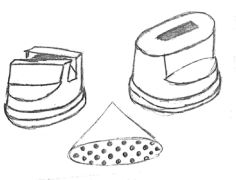
The first step to properly apply a pesticide is to calibrate the sprayer. A simple way to do this is called the 1/128th method (see http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PRRE-7.pdf to calibrate handheld sprayers, or http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PRRE-8.pdf for boom sprayers). Also see CTAHR's wall chart "Apply Pesticides Safely, Legally, Effectively."

Selecting the proper nozzle type and size is an important part of sprayer calibration. The newer, improved nozzles are better at applying the right amount of spray mix where it is needed with as little spray drift and drip as possible. First, select the nozzle type and size that produces the desired spray pattern and volume for the intended use. To do this, consider the amount of spray to be applied, how thoroughly the plants or area need to be covered, and the amount of potential spray drift. Next, determine if the nozzles will be used for broadcast application of a contact pesticide or systemic (translaminar) pesticide, or both. Based on your needs, choose from one of the following nozzle types.

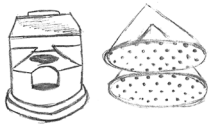
Standard **flat-fan nozzles** are widely used for broadcast and banding applications of herbicides and some insecticides and fungicides. Operating pressures of these nozzles range from 15 to 60 psi (pounds per square inch). At lower pressures the flat fan produces less drift and at higher pressures it produces better coverage. For banding sprays, flat-fan nozzles provide uniform coverage across the entire width of the spray pattern. The extended-range flat-fan tips have a tapered-edge spray pattern. For broadcast applications with a boom sprayer, these nozzles are set so their spray overlaps and produces an even pattern.

Twin-orifice flat-fan nozzles produce two flat-fan spray patterns, one angled 30° forward and the other 30° backward. The two spray directions give better penetration and overall spray coverage. These nozzles produce fine droplets, however, and increase the potential for spray drift.

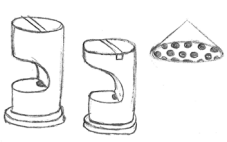
Floodjet and **solid-cone nozzles** produce large droplets. They are used for applying pre-plant herbicides and fertilizers with less clogging.



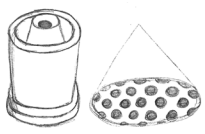
Flat-fan nozzle



Twin-orifice flat-fan nozzle



Floodjet nozzle



Solid-cone nozzle

Hollow-cone nozzles produce fine spray droplets and are generally used for contact pesticides and when foliage penetration and maximum coverage are needed.

Air-induction nozzles, also called **air-inclusion** or **venturi nozzles**, create negative pressure inside the nozzle body. This negative pressure produces large droplets filled with air bubbles but very few small droplets that can drift. Some of these nozzle types have two orifices, each producing a 110° flat-fan spray pattern with one pointed 60° forward and the other 60° backward. The pressure range for these air-induction nozzles is 20 to 90 psi.

For contact pesticides, medium to fine spray droplets are needed for complete spray coverage of the target. See examples of droplet sizes in the table at right. Hollow-cone or twinjet nozzles are used to produce a spray with fine droplets. The droplets come from different angles and provide thorough coverage. The problem with fine spray droplets is the increased potential for spray drift into non-target areas. In regions where high winds are common, choose a nozzle type that produces larger droplets, like the air-induction nozzles.

For systemic pesticides, select a nozzle that produces medium to very coarse droplets, such as the air-induction type. When their large droplets hit the target they explode, spreading pesticide over the foliage, flowers, etc., and provide coverage similar to finer sprays. They are best suited for broadcast spraying where leaf coverage and canopy penetration is important.

Droplet size classification as found in most nozzle catalogs

Droplet Category[1]	Symbol	Color Code	Approximate VMD Range (microns)[2]
Very Fine	VF	Red	< 145
Fine	F	Orange	145-225
Medium	M	Yellow	226-325
Coarse	C	Blue	326-400
Very Coarse	VC	Green	401-500
Extremely Coarse	XC	White	> 500

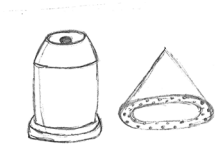
[1]ASABE (American Society of Agricultural & Biological Engineers) Standard 572.

[2]VMD = Volume median diameter—a value where 50% of the total volume or mass of liquid sprayed is made up of droplets larger than this value, and 50% is made up of droplets smaller than this value. Reported VMD ranges vary widely, based on the type of laser analyzer used.

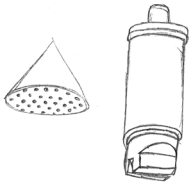
Table source: Robert Grisso, et al. 2013.

Rule of Thumb

Select the nozzle type and size that produces the largest droplets yet still provides good coverage at a given rate and pressure. For a uniform spray pattern with minimal drift, the sprayer pressure must be within the recommended range for the nozzle. If a larger output is needed, select a nozzle with a larger orifice. Trying to increase output by increasing the sprayer pressure is difficult and hard on the equipment—to double the output, the sprayer pressure must be increased four times! Refer to a nozzle catalog table to select the nozzle type and flow rate you need.



Hollow-cone nozzle



Air-induction flat-spray nozzle

More Information

Grisso, Robert, Hipkins, P., Askew, S., Hipkins, L., McCall, D. 2013. Nozzles: Selection and Sizing. Virginia Cooperative Extension, Virginia Tech, Virginia State University. http://pubs.ext.vt.edu/442/442-032/442-032_pdf.pdf. Accessed April 4, 2014.

Hollyer, Jim, Meyer, D., Brooks, F., Castro, L. et al. 2014. CTAHR Wall Chart Set: Protect Yourself and Workers From Pesticides; Apply Pesticides Safely, Legally, Effectively. College of Tropical Agriculture and Human Resources, University of Hawai'i at Mānoa. http://www.manoa.hawaii.edu/ctahr/farmfoodsafety/wp-content/uploads/2014/04/Hawaii-pesticide-education-wall-charts-mar-13-2014.pdf

Johnson, Monte, Swetnam, L. 2000. Sprayer Nozzles: Selection and Calibration. Cooperative Extension Service, University of Kentucky. http://www2.ca.uky.edu/agc/pubs/pat/pat3/pat3.pdf. Accessed April 4, 2014.

Hand sketches by April Suzuki, Pohnpei, after Robert Grisso, et al. 2013.

On-Farm Food Safety: A checklist of responsibilities for the safe us

Preparation for pesticide application

Step 1. Pesticide Selection

READ AND FOLLOW THE LABEL—IT'S U.S. LAW!

Pesticides must be currently or formerly licensed for use in the state of Hawai'i. Federal and state law requires that the intended crop, crop group, or site be listed on the pesticide label! Applying a pesticide on a crop, crop group, or site that is not listed on the label is a violation of federal and state law. Crops on which the pesticide was illegally applied can be destroyed by government agencies.

Commercial farmers, both conventional and organic, who sell any of their produce must:

- ❑ Use products labeled for "commercial" use. Products labeled for "home & garden only" or "residential use only" may not be used.
- ❑ Not make their own pesticides or apply them under certain conditions. The U.S. Environmental Protection Agency (EPA) clarified in 2013 that homemade pesticides cannot be used on any food crop unless it is only for personal, on-farm consumption. An exception to this guidance is 25(b) pesticides.
- ❑ Know the types of applications allowed by the label (i.e., broadcast, spot treatment, banded sidedress, drench, fumigation).
- ❑ Know the maximum label rates.

Step 2. Notification/Posting

By federal law, employers must provide workers (including volunteers) with Worker Protection Standard (WPS) training before the start of the sixth day working in a pesticide-treated area, and at least once every five years thereafter. Training is a Best Practice for family members, too, even if not required.

These *must* be displayed in a Central Notification Site (CNS):

- ❑ EPA worker pesticide safety poster with emergency medical information.
- ❑ An accessible pesticide application log sheet, up for a minimum of 30 days after the Restricted Entry Interval (R.E.I.) expires, on which it is a requirement or Best Practice to include these:
  - Area treated
  - Brand/product name
  - EPA Registration Number
  - Active ingredient(s)
  - Application date, beginning and end time
  - R.E.I. date and reentry time
  - Pre-Harvest Interval (P.H.I.) date and time.
- ❑ Depending on label directions, employees must be informed of an upcoming application either by a sign, verbally, or both.

- ❑ Record each application in a pesticide applications log.
- ❑ Post "Restricted Access" signs around the application site (as required by label).
- ❑ Have the original label and Safety Data Sheet (SDS) available at the work site.

Step 3. Personal Safety

Handler wears and maintains all Personal Protective Equipment (P.P.E.) as required by the P.P.E. manufacturer and provided by the employer. P.P.E. must be worn for all handling activities at all times. Wash P.P.E. with soap and water after each use. Air-dry and store separate from pesticides.

Wash hands, face, and other exposed skin areas with soap and water after pesticide activities.

An emergency Decontamination Kit , including the following, *must* be within ¼ mile of the work site at all times:

- ❑ 1 pint of eye-flush water *for each* handler (when using pesticides that require eye protection) *must* be immediately available.
- ❑ Enough clean water for routine and emergency washing *for each* handler or person entering during the R.E.I. (held in a food-grade container). 3 gallons per person is recommended.
- ❑ Soap
- ❑ Single-use towels
- ❑ Clean change of clothes or coverall.

Mixing, applying, and w

Step 4. Mixing

Protect your body, face, and respiratory system. Always wear P.P.E. listed on the label when inspecting, maintaining, or repairing equipment prior to or after application and when opening, measuring, mixing, loading, applying, and cleaning up pesticides. Take extra care while handling the concentrated pesticide product. Additional PPE may be required (i.e., aprons). If mixing multiple pesticides or additives, follow the label order. Order matters.

Mixing Water – should be as "clean" as possible. Pesticide performance can be significantly reduced by heavy sediment.

Batch Mixing – See label directions for adding and mixing different pesticide formulations, adjuvants, and diluents. Following these directions can increase efficiency of the mixture and reduce harm to people, equipment, and crops. In the absence of any specific instructions, conduct a compatibility test such as a "jar test."

A pesticide storage container should be:

- ❑ Self-contained and used only for pesticides
- ❑ Dry, cool, well ventilated
- ❑ Locked
- ❑ Labeled
- ❑ Inventoried
- ❑ Organized: arrange all dry chemicals above liquids, and different pesticides by type (fungicides, herbicides, etc.)

se of pesticides* on conventional and organic food farms in Hawai‘i

aiting intervals**

Step 5. Applying and Cleaning Up

Calibrate application equipment according to the size of the crop and the terrain to be treated. There are many calibration methods to choose from. The 1/128th Method for Sprayer Calibration is an easy method. All application equipment should be calibrated, both liquid and dry.

- ❑ Inspect all application equipment prior to application. Check nozzles, pressure, tractor speed, hoses, and connectors.
- ❑ Check the weather (wind speed, rain, temperature). Apply only when weather conditions are safe and within label tolerances.
- ❑ Follow the label for dosage and dilution and mix only what you need.
- ❑ Apply at the same constant and steady speed and pressure as during calibration for accuracy of delivery.
- ❑ Place a warning sign (as required) in the treated area (or warn verbally) and record application information in a Central Notification Site.

Equipment clean-up best practices:

- ❑ Triple-rinse tank
- ❑ Flush nozzles
- ❑ Dispose of rinsate as per label instructions.

- ❑ Dispose of chemicals and containers as per label instructions.

- ❑ *Never* leave containers in the field or scattered about the property, whether full, partially full, or empty. They need to be locked up.

Step 6. Entering

Follow label Restricted-Entry Interval (R.E.I.)

It is ***illegal*** to enter the treated area during the R.E.I. without appropriate P.P.E.

The R.E.I. is the interval (period of time in hours or days) after a pesticide application during which access to the treated area has restrictions on entry for unprotected workers.

Pesticide Toxicity Signal Words on Label

DANGER / PELIGRO–POISON
High Toxicity -
Hazard Category I
Consuming a few drops to 1 teaspoon may kill an adult.

DANGER / PELIGRO
High Toxicity -
Hazard Category I
Severe damage to the skin, eye, or respiratory system. Corrosive.

WARNING / AVISO
Moderate Toxicity -
Hazard Category II
Consuming 1 teaspoon to 1 ounce may kill an adult. Moderate damage to the skin, eye, or respiratory system.

CAUTION
Low or Very Low Toxicity -
Hazard Category III or IV
Consuming over 1 ounce may kill an adult. Mild irritation of the skin, eye, or respiratory system.

Harvest

Step 7. Waiting Before Harvest

Follow label Preharvest Interval (P.H.I.) or “Days to harvest”

It is ***illegal*** to harvest at any time before the end of the P.H.I.

The P.H.I. is the interval (period of time in days) between the last pesticide application and harvest of the treated crop. This time allows the pesticide to break down completely, or to a level of low risk to the consumer.

***Definitions**
The EPA defines a pesticide as “any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest.” Pesticides include disinfectants and sanitizers. Pests can be insects, rodents and other animals, unwanted plants (weeds), or microorganisms such as fungi, bacteria, and viruses. Under U.S. law, a pesticide is also any substance or mixture of substances intended for use as a plant growth regulator, defoliant, or desiccant.

Disclaimer
This worksheet is a summary of practices and is not intended to replace a training course or the guidance in this manual: **How to Comply with the Worker Protection Standard for Agricultural Pesticides: What Agricultural Employers Need To Know**. E.P.A. publication, revised 2005.

Step 8. Harvest

It is ***now legal*** to harvest a crop because the P.H.I. has ended. This means the applied pesticide concentration is at or below the “Maximum Residue Limit” (MRL), or “Tolerance,” as established by the EPA.

Selling produce (or any food) that has residue from a pesticide that did not have the specific crop or crop group on the label, or where the allowed pesticide residue at harvest was higher than the allowed MRL, is illegal; the produce is now “adulterated.”

The Hawai‘i Department of Health (DOH) can levy fines up to $10,000 per violation if they find pesticides on a specific crop that are not allowed by the label, or pesticide levels above the Maximum Residue Limit. DOH may also recall, embargo, seize, or destroy the crop and inform the media of violators.

In addition, there may be a warning letter or civil penalty from the Hawai‘i Department of Agriculture (HDOA) (fine of up to $1,000 per violation, imprisonment for not more than one year, or both). DOH and HDOA work together when there is misuse of pesticides on food crops.

There are also federal civil/criminal penalties for shipping adulterated produce or foods within or out of state in accordance with the FDA’s Food, Drug and Cosmetic Act.

Parts of a Pesticide Label

Highlighted areas are *required* for Central Notification Site, Worker Protection Standard (WPS), and/or Good Agricultural Practices (GAPs).

What pesticide is in the container?

(1) Classification Statement
(2) Type of pesticide / Mode of action
(3) Brand name/product name
(4) Ingredient statement (chemical name)
(5) EPA Registration No., EPA Establishment No.
(8) Net contents
(9) Name of manufacturer

How hazardous is the pesticide?

(6) Signal word and symbol (if used)
(7) First Aid Statement or Statement of Practical Treatment (note to physician)
(10) Precautionary Statements – Hazards to humans, domestic animals, environment. Physical hazards and chemical hazards – Personal Protective Equipment (P.P.E.)

How do I apply the pesticide correctly for my crop, site, target organism or method of application?

(11) Directions for Use (general use information/ product information)
(13) Agricultural Use Requirements for Restricted-Entry Interval (R.E.I.), Personal Protective Equipment (P.P.E.) and Worker Notification (also see (10))
(14) Mixing and Application
(16) Rates and Pre-Harvest Interval (P.H.I.)

Can I legally tank-mix this pesticide?

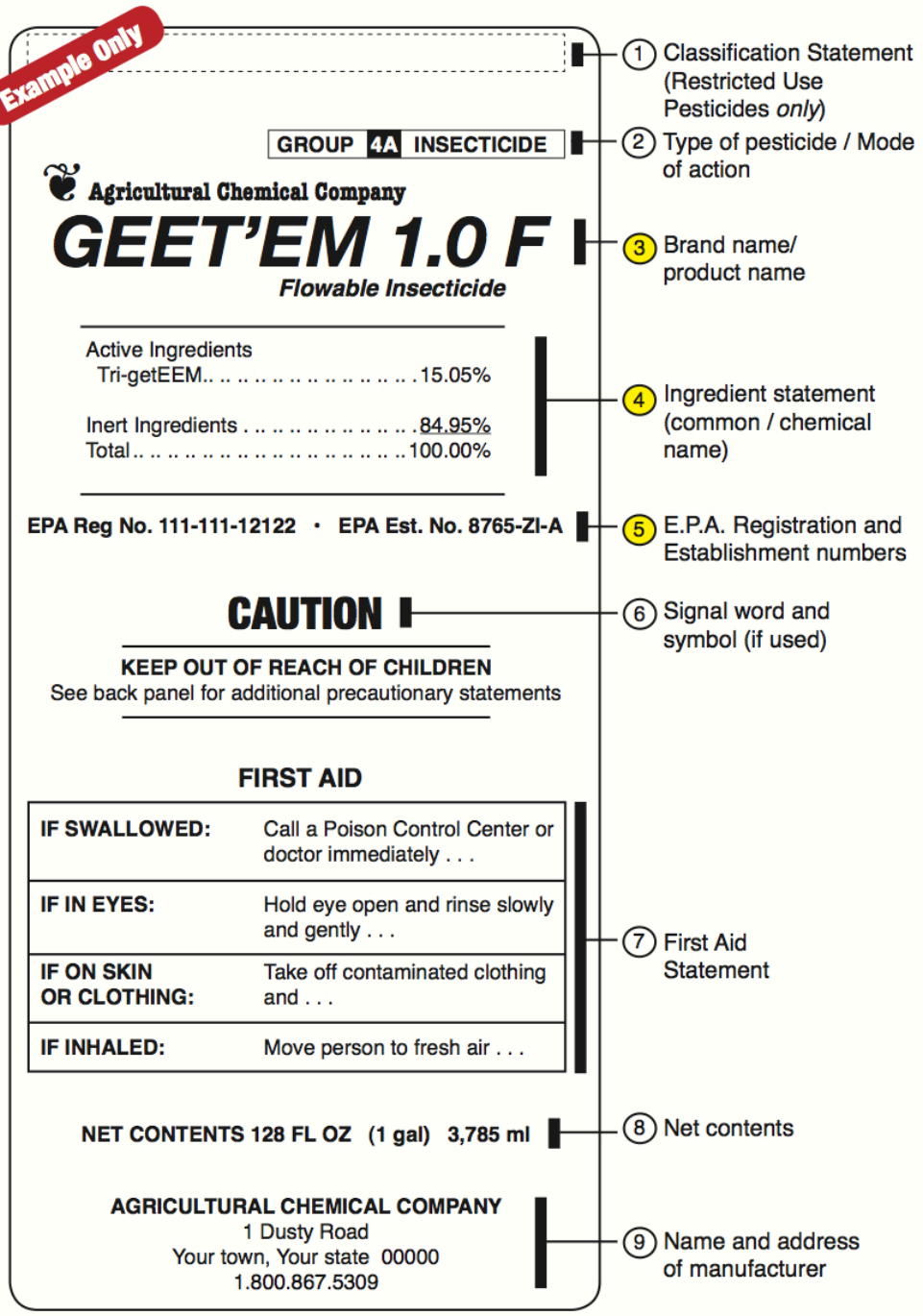
(15) Compatibility Note, plus (14)

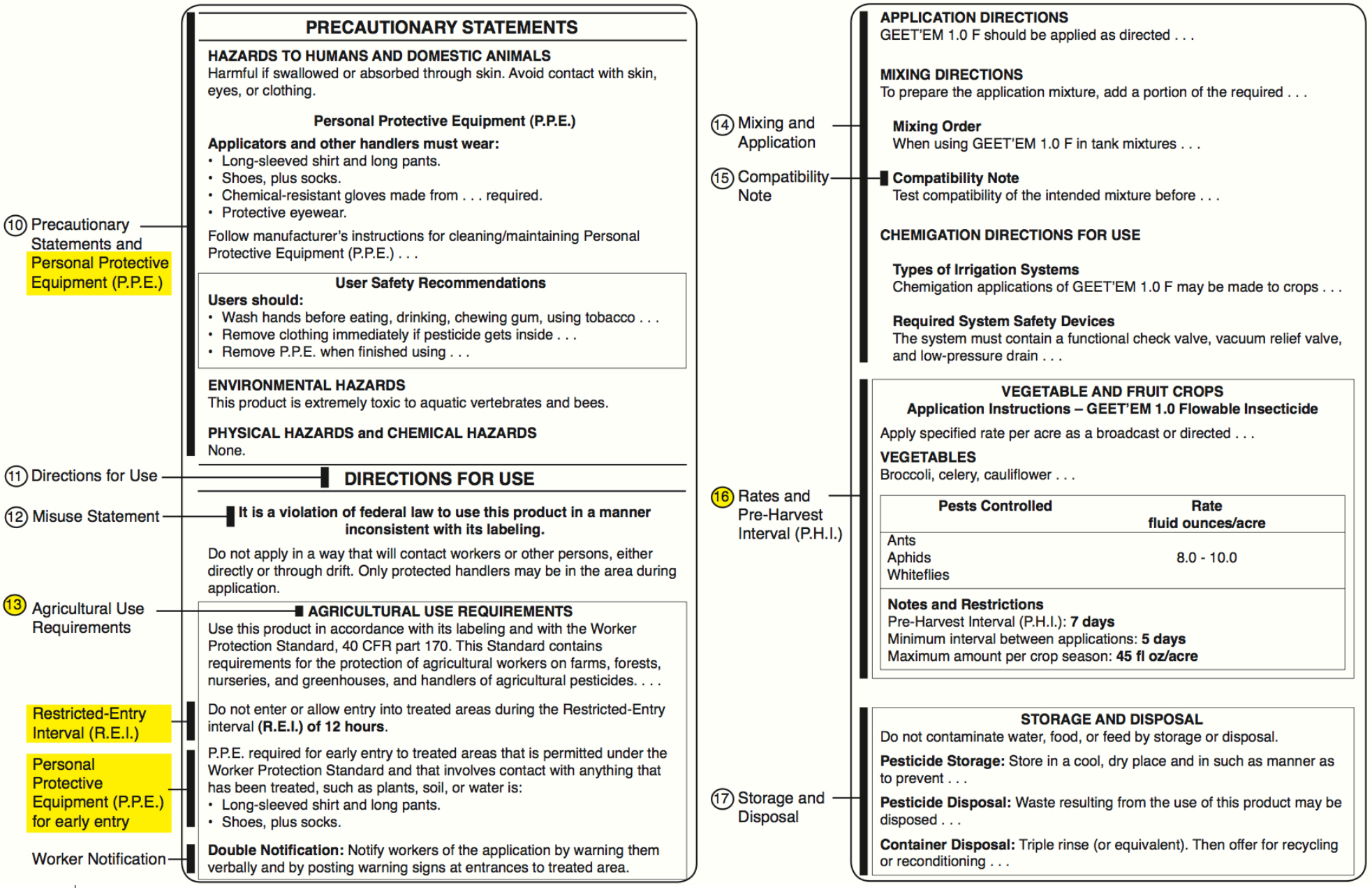
Is it a crime to apply the pesticide in a way contrary to the label?

(12) Misuse Statement (under Directions for Use (11))

How do I store and dispose of the pesticide?

(17) Storage and disposal (under Directions for Use (11))

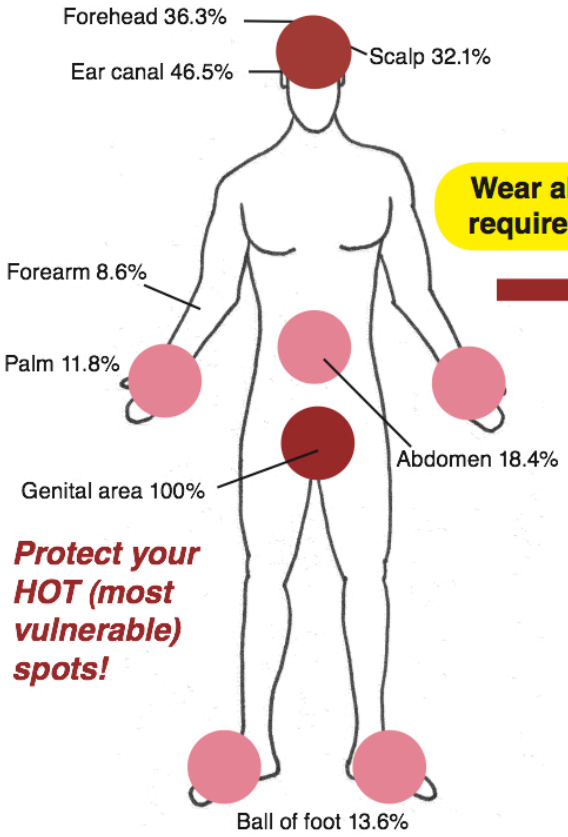


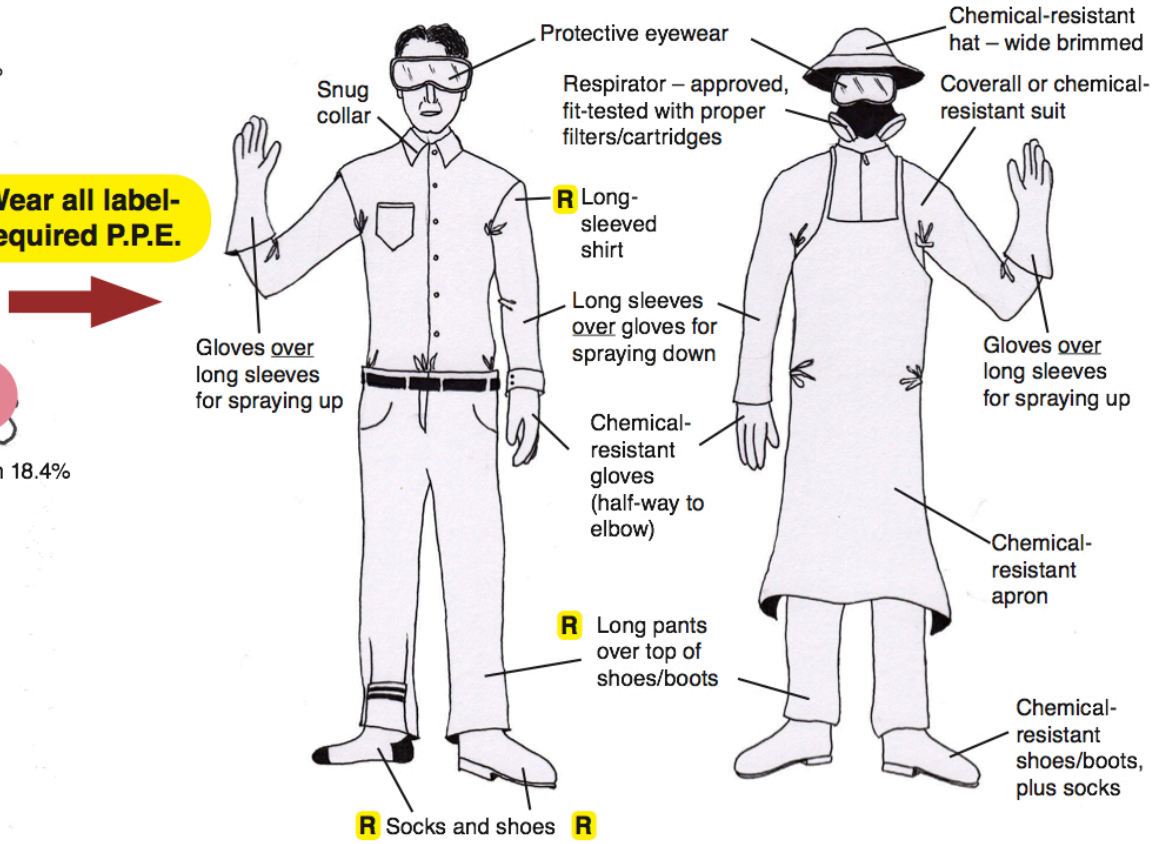


Sample label from CTAHR wall chart "Apply Pesticides Safely, Legally, Effectively."

Personal Protective Equipment (P.P.E.)

All required P.P.E. (see label) must be supplied and maintained by the employer for use during mixing, application, early entry, equipment maintenance, and cleanup.





Pesticide (%) absorbed by different parts of the body in 24 hours (if not completely washed off).

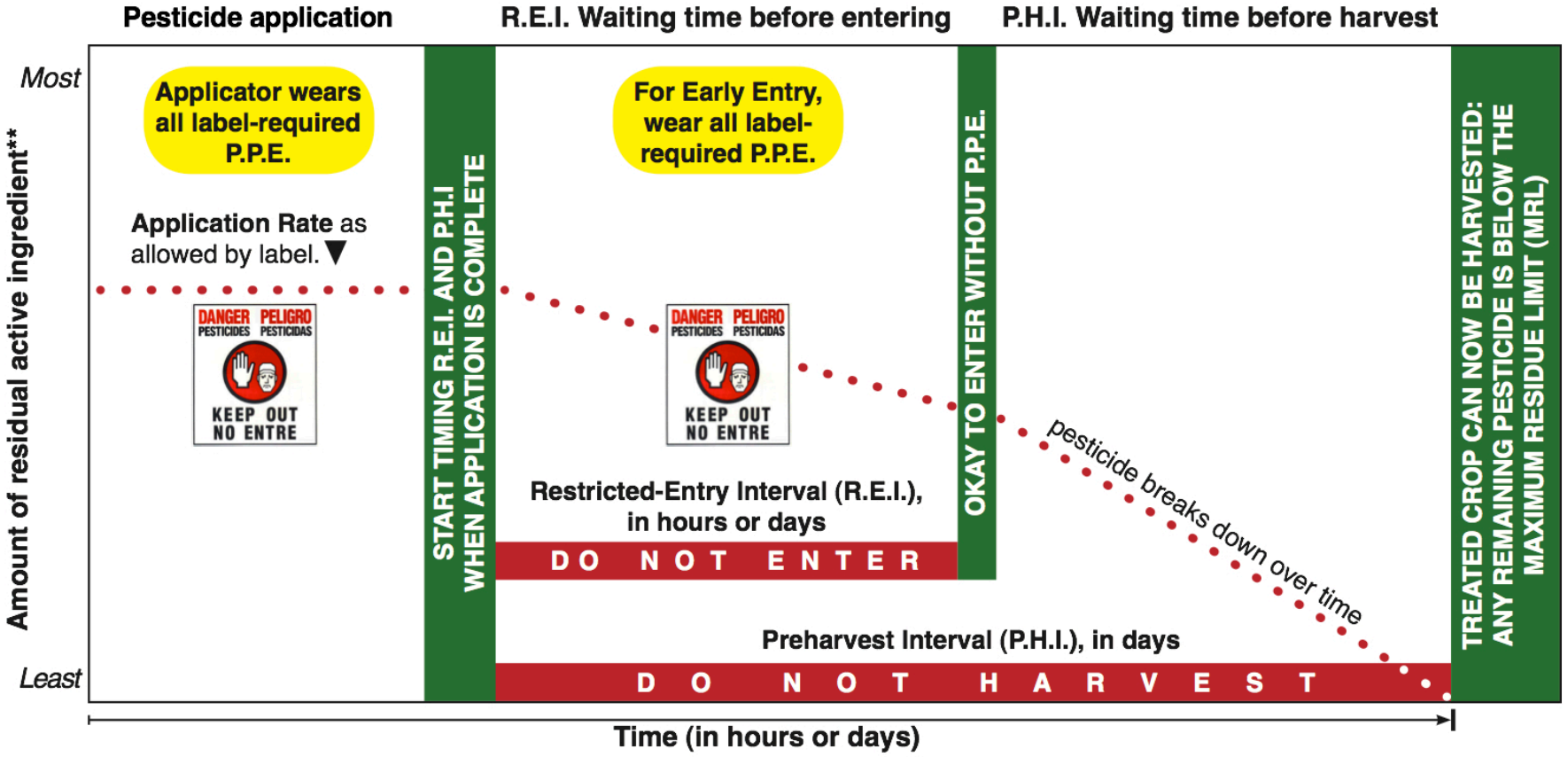
(Feldman & Maibach. 1974. Percutaneous penetration of some pesticides and herbicides in man. *Toxicology and Applied Pharmacology* 28, pp. 399–404).

Above are examples of P.P.E. that might be required by a pesticide label. The four items marked with R are required for most pesticide applications, along with a Decontamination Kit.
P.P.E., including clothes, must be washed and dried after each day's use and stored away from pesticides and other chemicals. Change gloves and respirators as per manufacturers' specifications.

Illustrations from CTAHR wall chart "Apply Pesticides Safely, Legally, Effectively."

Restricted-Entry Interval (R.E.I.) & Pre-Harvest Interval (P.H.I.)

This chart shows the breakdown of a pesticide (dotted line) from application (left), through the Restricted-Entry Interval (R.E.I.) where early-entry workers must wear P.P.E (center), until the crop can be legally harvested (right). Required waiting times (R.E.I. and P.H.I.) for each pesticide are given on the pesticide's label.



** The shape and slope of the residual active ingredient line is for illustration purposes only. Each pesticide has its own application rate, R.E.I., and P.H.I. requirements as given on the label, and it will break down at a specific rate.

Chart from CTAHR wall chart "Apply Pesticides Safely, Legally, Effectively."

On-Site Pesticide Registry Log for Pesticide Use on Food Crops, Nursery Crops, Landscapes, or Conservation Operations

Directions: Read the label on each pesticide container you are using. Below, write down information on how the label says to legally use this pesticide product. ***USE ONE SET OF SHEETS FOR EACH DIFFERENT PESTICIDE USED.*** *The circled numbers (3) refer you to the example label to show where that information is located.* ***For more information:*** http://hawaii.gov/hdoa/pi/pest/list

1) Is pesticide approved/licensed for use in Hawai'i by the Hawai'i Department of Agriculture: ❑ Yes ❑ No ❑ 25(b) **If "No," do not use in Hawai'i.**

2) Pesticide product name (3): _____ E.P.A. Registration Number (5): _____

3) Active ingredient(s) (4): _____ Formulation (3): ☐ liquid ☐ powder ☐ granule ☐ pellet ☐ other

4) Is this pesticide a Restricted Use Pesticide (RUP) (1): ☐ Yes ☐ No. If "Yes," you will need a valid RUP Applicator Certification to apply it.

5) What is the pesticide's Signal Word (6): ❑ DANGER/POISON ❑ DANGER ❑ WARNING ❑ CAUTION

6) What Personal Protective Equipment (P.P.E.) is *required* by the pesticide label (compare it to the list below). Note: By law, employers MUST provide employees with P.P.E. that is required by the label(s). (10)

Mixing	Application & Clean-Up	Early Entry	Required Personal Protective Equipment (P.P.E.)
☑	☑	☑	**Pants** (long)
☑	☑	☑	**Shirt** (long-sleeved)
☑	☑	☑	**Shoes** ☐ Waterproof ☐ Chemically resistant
☑	☑	☑	**Socks**
☑	☑	☑	**Decontamination supplies** ☑ 1 pint for eye-flushing *per person, immediately available* for handling or early-entry. ☑ At least 3 gallons of clean water for wash *for each* handler or person entering during the R.E.I. (held in a food-grade container) ☑ Soap ☑ Single-use towels ☑ clean change of clothes or coverall ☑ ALL within ¼ mile of application site

Plus, whatever additional P.P.E. is required by the label

☐	☐	☐	**Apron** (chemical resistant from neck to at least the knees)
☐	☐	☐	**Coverall** (woven cotton, polyester, cotton/synthetic material blend, or non-woven fabric, as per label)
☐	☐	☐	**Eyewear** (protective, chemical resistant) ☐ Safety glasses w/ side shields & brow protection ☐ Face shield ☐ Splash-proof goggles
☐	☐	☐	**Gloves** (waterproof or chemical resistant) ☐ Barrier laminate ☐ Butyl rubber ☐ Nitrile rubber ☐ Neoprene rubber ☐ Natural rubber ☐ Polyethylene ☐ Polyvinyl chloride (PVC) ☐ Viton ☐ *or as label requires* _____
☐	☐	☐	**Hat** (chemical resistant) ☐ Polyvinyl chloride (PVC) ☐ Plastic *and* ☐ Wide-brimmed ☐ Hood
☐	☐	☐	**Respirator - NIOSH approved** ☐ TC-84A (dust/mist mask) ☐ TC-21C ☐ TC-23C (chemical cartridge) ☐ TC-14G ☐ TC-19C ☐ TC-13F **Cartridges/pre-filters:** ☐ HE ☐ N ☐ P ☐ R ☐ 100
☐	☐	☐	**Suit** (chemical resistant) ☐ Rubber ☐ Plastic ☐ Tyvek®

7) The product CAN / CANNOT (circle) be tank-mixed with: (14) (15) ________________
(use another Registry Log for this additional product). *By law, you are required to follow the longest R.E.I. and P.H.I. of the two or more pesticides that are mixed, as well as wear the most protective of the required P.P.E. NOTE: mixing order is important for safety and effectiveness.*

8) What are the container disposal requirements? (17) ________________

9) Worker Notification (13): is a Verbal (V) and/or Posted (P) warning required? If none stated, use either Verbal or Posted:
❏ Verbal only ❏ Posted only ❏ Both

10) Do you have the Safety Data Sheet (SDS)? ❏ Yes ❏ No If "No," contact your pesticide supplier immediately and get one.

11) If you have employees, do you have a Central Notification Site for E.P.A. Worker Protection Standard poster, pesticide application information, and Emergency Medical information? ❏ Yes ❏ No If "No," you will need to establish a location and display a poster and application information.

12) If you have employees, do you have a designated decontamination site within ¼ mile of a work site? ❏ Yes ❏ No If "No," you will need to get one.

What crop or site are you applying this pesticide to? Use ONE line for EACH crop or site. The crop MUST be on label (see *Directions For Use*) (11) (16)	What is the application rate per area? Write amount and check ONE unit of measure. (see *Recommended Application*) (16)	What is the Restricted Entry Interval (R.E.I.) for this crop or site? (see *Agricultural Use Requirements*) (13)	What is the Preharvest Interval (P.H.I.) for this crop or site? (see *Recommended Application*) (16)	What is the re-treatment interval, if allowed, in a crop cycle or at a site? (see *Recommended Application*) (16)	Maximum number of allowed pesticide applications & total amount of pesticide allowed per crop season (see *Recommended Application*) (16)
Crop ______ Pest	❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal. ❏ sq. ft. ❏ acre	❏ hours ❏ days	❏ days	❏ none ❏ days ❏ weeks	application(s) ❏ crop season ❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal.
Crop ______ Pest	❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal. ❏ sq. ft. ❏ acre	❏ hours ❏ days	❏ days	❏ none ❏ days ❏ weeks	application(s) ❏ crop season ❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal.
Crop ______ Pest	❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal. ❏ sq. ft. ❏ acre	❏ hours ❏ days	❏ days	❏ none ❏ days ❏ weeks	application(s) ❏ crop season ❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal.
Crop ______ Pest	❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal. ❏ sq. ft. ❏ acre	❏ hours ❏ days	❏ days	❏ none ❏ days ❏ weeks	application(s) ❏ crop season ❏ oz. (vol.) ❏ pt. ❏ oz. (wt.) ❏ qt. ❏ lb. ❏ gal.

Pesticide Application Log for Hawai'i Conventional and Organic Farms: Requirements of Worker Protection Standard (WPS), Restricted Use Pesticide (RUP), National Organic Program (NOP), and/or Good Agricultural Practices (GAPs)

	Example	Application	Application	Application
Applicator's name/certificate #	J. Thomas / 86753009			
Crop name or site of application	Celery			
Application equipment OK? (Y / N), if N, fix or replace before using	N, had to fix hose leak	Y / N	Y / N	Y / N
Pest to be controlled	Whitefly			
Pesticide **Product or Brand name**. --- EPA Registration Number. --- Active Ingredient(s).	Geet'EM 1.F --- 8765-ZI-A --- Tri-getEEM	--- ---	--- ---	--- ---
Location of treated area (field #, location description)	#3, upper hill			
Size of area treated (sq. ft., acres)	0.75 sq. ft. or (ac.)	_____ sq. ft. or ac.	_____ sq. ft. or ac.	_____ sq. ft. or ac.
Rate of application per unit area as allowed by label (e.g., oz./acre)	1.0 oz. / ac.	_____ oz. / ac.	_____ oz. / ac.	_____ oz. / ac.
Total amount of pesticide applied (Size of area treated x Rate per unit area)	0.75 oz. / ac.	_____ oz. / ac.	_____ oz. / ac.	_____ oz. / ac.
Application date and time application finished	2 / 12 / 2013 8:15 (am) / pm	/ / 20___ _____ am / pm	/ / 20___ _____ am / pm	/ / 20___ _____ am / pm
Restricted-Entry Interval (R.E.I.): length of R.E.I. in hours plus the date and time the R.E.I. will be finished	12 (hours) / days 2 / 12 / 2013 8:15 am / (pm)	_____ hours / days / / 20___ _____ am / pm	_____ hours / days / / 20___ _____ am / pm	_____ hours / days / / 20___ _____ am / pm
Preharvest Interval (P.H.I.): length of P.H.I. in days plus date and time the P.H.I. will be finished.	7 hours / (days) 2 / 19 / 2012 8:15 (am) / pm	_____ hours / days / / 20___ _____ am / pm	_____ hours / days / / 20___ _____ am / pm	_____ hours / days / / 20___ _____ am / pm
Personal Protective Equipment (P.P.E.): Do you know and are you using the P.P.E. required by the label for mixing, application, early entry, and clean-up?	(Y) / N	Y / N	Y / N	Y / N
Worker Protection Standard (WPS) compliance: • Were employees verbally notified? --- • Was pesticide application information posted at a Central Notification Site (CNS)? --- • Were fields clearly marked with signage as required by label?	(Y) / N --- (Y) / N --- Y / N / (NA)	Y / N --- Y / N --- Y / N / NA	Y / N --- Y / N --- Y / N / NA	Y / N --- Y / N --- Y / N / NA

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