



Key to Pesticide Safety and Education

The Pesticide Label

April–June 2016

IN THIS ISSUE:

Regulatory Updates.	1
Respirator Buyers Beware	2
Search for Mosquito Repellents On-line.	3
Laundering Pesticide-contaminated Work Clothes (recertification article).	4
Recertification credits may be earned by certified applicators	4
Maintaining Clothing and Personal Protective Equipment (recertification article).	13
Hurricane Season in Hawaii starts June 1.	16
A Summary of Revisions to the Worker Protection Standard—2015 (recertification article).	16
Illustrated Glossary (recertification article).	22
Articles in Previous Issues	24

Regulatory Updates

EPA revised the Worker Protection Standard for Agricultural Pesticides

In 1992, the U.S. Environmental Protection Agency (EPA) issued a comprehensive regulation called the *Worker Protection Standard for Agricultural Pesticides* (WPS). The WPS covers pesticides used in the outdoor and enclosed space production of plants on farms, forests, and nurseries, as well as greenhouses. The WPS requires agricultural employers to take steps to reduce pesticide-related risks when agricultural workers and pesticide handlers are exposed to these pesticides. The EPA has made several changes to the WPS since it was fully implemented in 1995. On November 2, 2015, the

EPA revised the WPS, making significant changes to the rule's requirements. Most of the revised provisions will become effective January 2, 2017; there are four provisions that are delayed until January 2, 2018. The EPA intends to revise the current "How to Comply Manual" to provide an updated resource; it will be posted on their website when it becomes available.

A summary of the changes starts on page 16 as a recertification article.

Special Local Needs Registrations

New or Renewed since the last issue of this newsletter

None.

Continued on page 16

Respirator Buyers Beware

Source: April 29, 2016 email message from the Centers for Disease Control and Prevention (CDC). The CDC is a part of the U.S. Department of Health and Human Services. “NIOSH” stands for “National Institute for Occupational Safety and Health.” It is a part of the CDC.

NIOSH has become aware of a counterfeit N95 Respirator on the market. The manufacturer Zubi-Ola is selling N95 respirators and marketing them as NIOSH-approved even though Zubi-Ola is not a NIOSH approval holder or a private label holder.

In addition, NIOSH was made aware of manufacturers misrepresenting the NIOSH-approval. These manufacturers include:

- 1.) Wein Products—All approvals for Wein Products were rescinded in 2011. However, the manufacturer’s website continues to state the ViraMask N99ESC is certified by NIOSH. [View the user notice announcing the rescission.](#)
- 2.) Steelpro Safety—Steelpro Safety is a private label holder of Fido Masks. In 2014, Fido rescinded the certificates of approval for their respirators, but Steelpro’s website continues to state that respirator models, F720V and F333V, meet NIOSH standards. [View the user notice announcing the rescission.](#)
- 3.) Handan Hengyong—All certificates of approval for Handan Hengyong were voluntarily rescinded as of September 2014. Handan Hengyong continues to include information on its website misleading end users to believe that their respirators are NIOSH-approved. [View the user notice announcing the rescission.](#)

NIOSH contacted these manufacturers and requested they remove all misleading information from their website including all references to NIOSH and to 42 CFR 84.

How can you be sure your respirator is truly NIOSH-approved?

Check the respirator approval markings or [Certified Equipment List](#).

Additional information is available on the NIOSH [Trusted Source Page](#).

We will continue to post counterfeit respirators or those misrepresenting the NIOSH approval on our [counterfeit respirator page](#).

* * *

Search for Mosquito Repellents On-line

<https://www.epa.gov/insect-repellents/find-insect-repellent-right-you>

EPA's webpage, *Find the Insect Repellent that is Right for You*, lets you search for a mosquito repellent labeled for spraying or rubbing on the skin. It will sort combinations of your choice of six active ingredients and the number of hours to expect protection from mosquitoes or ticks, either 4 hours or less, 5–8 hours, 9–12 hours, or 13–16 hours.

The screenshot shows the EPA website's search tool for insect repellents. The header includes the EPA logo and navigation links. The main heading is 'Find the Insect Repellent that is Right for You'. Below this, there's a search form with two main questions: 'How much time will you need to be protected from biting insects?' and 'Do you need protection from mosquitoes, ticks or both?'. The first question has a dropdown menu set to 'Any'. The second question has a dropdown menu set to 'Mosquitoes and ticks'. Below these questions, there's a note: 'All products work against mosquitoes, and not all against ticks.' and a section for refining the search with options like 'Active Ingredient' and 'Protection Time'. A 'Which product are you interested in?' field is also present.

A search result looks like this:

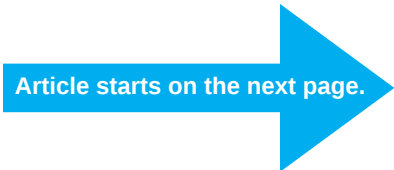
Some repellents are not sold in Hawaii.

Product Name	Hourly Protection Time for Mosquitoes	Hourly Protection Time for Ticks	Active Ingredient	%	Company Name	EPA Registration Number
OFF! Deep Woods Sportsmen Insect Repellent II	9	*	DEET	31	S. C. Johnson & Son, Inc.	4822-397
Avon Skin-So-Soft SSS Bug Guard Plus IR3535 Expedition Insect Repellent SPF 30 Sunscreen Spray Very Water Resistant Unscented	10	12	IR 3535	19.7	Avon Products, Inc.	806-32
B-Bite Free Insect Repellent Spray	10	10	DEET	98.1	Faulkwood Chemical, LLC	54287-2-85230

* * *

Laundering Pesticide-contaminated Work Clothes (recertification article)

Article starts on the next page.



The recertification article is on the next eight pages. It is a reprint of a leaflet titled Laundering Pesticide-contaminated Work Clothes (A. Thostenson, C. Ogg, K. Schaefer, M. Wiesbrook, J. Stone, and D. Herzfeld. January 2016, North Dakota State University). It's about using a washing machine to wash pesticide residue from protective clothing, like shirts, pants, socks, or coveralls made of woven cloth. The original leaflet may be downloaded from

<https://www.ag.ndsu.edu/pubs/plantsci/pests/ps1778.pdf>

It is not about cleaning personal protective equipment (PPE) coated with or made of metal, plastic, or rubber such as gloves, boots, safety glasses, goggles, respirators, aprons, or liquid-proof coveralls, jackets, or pants. To learn about cleaning and maintaining PPE, read the article Maintaining Clothing and Personal Protective Equipment which starts on page 13.

Recertification credits may be earned by certified applicators

who score at least 70% on the open-book quiz about the recertification articles in this newsletter. These articles have a title followed by “(recertification article).” However, credits may not necessarily apply to the following categories: Private 2, Private 3, Commercial 7f, and Commercial 11. (The credits are also known as *continuing education units* or *CEU* credits.) The quizzes are administered by the Hawaii Department of Agriculture’s staff. See the full explanation and a link to the list of available quizzes at the bottom of the Department’s webpage <http://hdoa.hawaii.gov/pi/pest/pesticide-applicator-certificationrecertification-2/> under the subtitle “QUIZ SESSIONS.”

To ask about earning recertification credits, call one of the Department’s phone numbers:

Kauai applicators—Call the Honolulu office, either directly (808) 973-9409 or 973-9411, or through the Kauai State Toll Free Access number 274-3141; and then enter extension 39409 or 39411 followed by “#.”

Oahu applicators—Call the Honolulu office directly (808) 973-9409 or 973-9411.

Maui, Molokai or Lanai applicators—Call the Honolulu office, either directly (808) 973-9409 or 973-9411; or through the Maui State Toll Free Access number 984-2400 and then extension 39409 or 39424 followed by “#.”

Hawaii island applicators—Call the Hilo office directly (808) 974-4143 or (808) 333-2844.

* * *

PS1778

Laundrying Pesticide-contaminated Work Clothes

Andrew Thostenson

Pesticide Program Specialist, North Dakota State University

Clyde Ogg

Pesticide Specialist, University of Nebraska-Lincoln

Kristine Schaefer

Pesticide Program Manager, Iowa State University

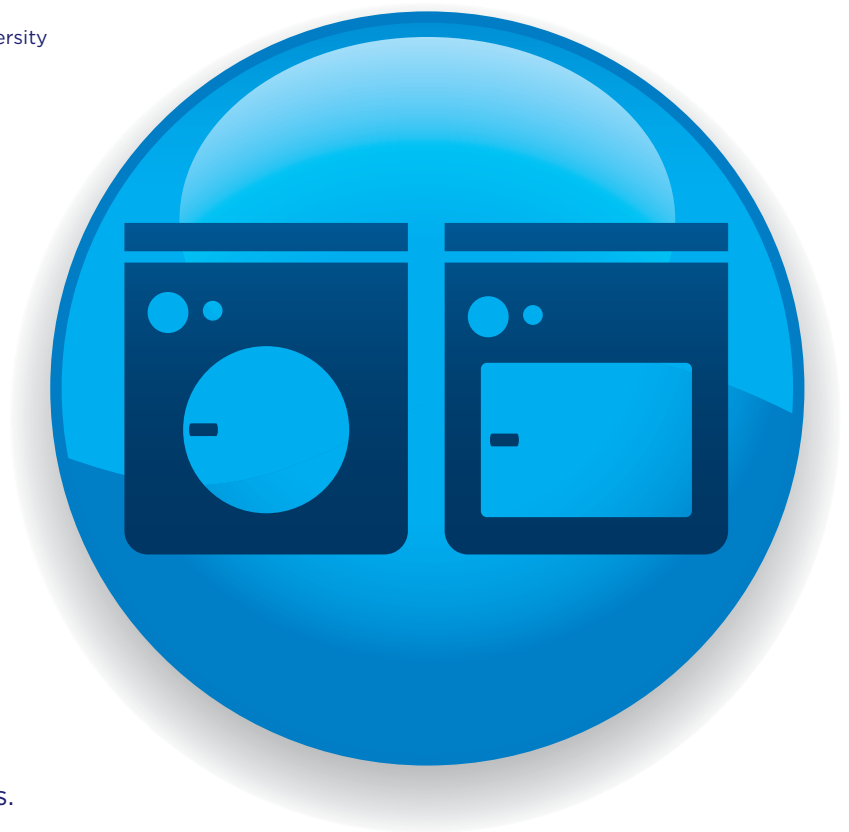
Michelle Wiesbrook

Pesticide Specialist, University of Illinois

John Stone

 Pesticide Safety Education Program Coordinator,
Michigan State University

Dean Herzfeld

 Pesticide Safety Education Coordinator,
University of Minnesota


Personal protective equipment (PPE) is the last line of defense to protect the body from pesticide exposure. Often, conventional work clothing is the primary form of PPE.

Work clothes also are worn under more extensive garments such as aprons, chaps or chemical-resistant suits.

Ultimately, work clothes will become contaminated with pesticides as part of the handling, loading, mixing and application process. Therefore, you need to handle and wash work clothing carefully.

NDSU EXTENSION
SERVICE

Some common-sense approaches for cleaning pesticide-soiled clothing include:

- **Reviewing the pesticide label** to determine if the clothing can be washed and if so, how (This is a legal requirement.) **(Figure 1)**
 - If garments are heavily contaminated, laundering them may not be an option.
“Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate.”
 - If the label allows you to launder clothes that are not heavily contaminated, look for and follow label statements that direct you to use special procedures.
“... use detergents and hot water. Keep and wash PPE separately from other laundry.”
- **Handling, segregating, storing and washing clothes** in a manner that will minimize contamination in the home and/or exposure to skin
- **Using optimum wash settings** to remove pesticide contaminants from garments
- **Decontaminating the washing machine** before using it for other household clothing
- **Notifying commercial laundering firms** that they will be handling pesticide-contaminated garments if you send your contaminated clothing to them
- **Checking with the manager or owner** of a laundromat or public washing facility about prohibitions or special handling policies if you plan to wash your contaminated clothing at those facilities

Figure 1.
Consult the pesticide label for washing prohibitions or special laundering instructions.
(NDSU photo)



Minimize Pesticide Residues in the Home and Avoid Human Exposure

Pesticide labels require pesticide applicators, handlers and workers to protect themselves and others from exposure to pesticides. Thus, pesticide-contaminated clothing should be handled as follows:

- While outdoors, shake, sweep or dust off the clothing with compressed air and remove any dry material from the clothing. Pay special attention to cuffs and pockets where residues often collect.
- Remove clothing outside the home or establish a changing place in the home that can be decontaminated easily after each use.
- Launder clothes as soon as possible. Studies indicate that holding clothes for 24 hours or more significantly reduces the washing efficiency.
- If you don’t wash clothes immediately:
 - Store them outside the home in a garage, shop or porch if possible. Otherwise, store them in a designated area in the home that can be decontaminated easily after each use.
 - Store separately from other household clothing in a plastic garbage bag or sealed, dedicated container. **(Figure 2)**



Figure 2. Plastic storage bin with sealable lid available at most home improvement stores.
(NDSU photo)

- Contaminated clothes should be washed separately from other household laundry.
- The person responsible for washing clothes should avoid skin exposure from the contaminated clothing by wearing a long-sleeved shirt and waterproof gloves when loading the washing machine. **(Figure 3)**



Figure 3.
Wear a long-sleeved shirt and waterproof gloves to minimize skin exposure when loading the washer with pesticide-contaminated clothing.

(NDSU photo)

Use Optimum Wash Settings and Decontaminate Washer After Use

- If available, read the manufacturer's directions for operating your particular machine. The directions often provide tips and detailed descriptions on how to achieve the best results. **(Figure 4)**
- Load only a few items into the washing machine. The washer provides the best agitation and dilution when it is loaded to no more than 50 to 75 percent of its clothing capacity.
- Use the maximum amount of detergent the machine's manufacturer recommends.
- **Detergents and supplemental wash tips:**
 - Use high-quality detergents and avoid products termed "gentle detergents" that are designed for fragile fabrics or baby clothing.
 - Liquid or dry detergents provide similar wash efficiency when used with sufficient water volume, duration, agitation and temperature.

Tips continue on Page 4

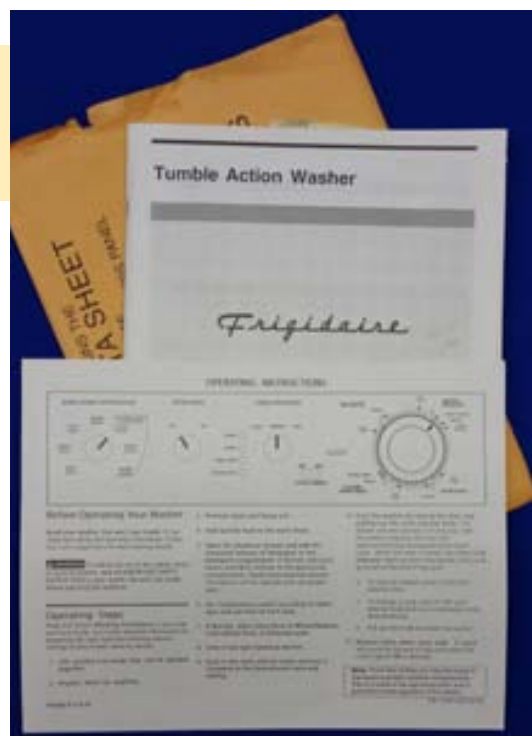


Figure 4. User manual.

(NDSU photo)

- Bleach or ammonia has not been demonstrated to help remove pesticides consistently. (Figure 5)
 - Pre-treating garments with stain-removal products does not improve wash efficiency significantly.
 - Fabric softeners do not help remove pesticide residues.
 - Pouches or pods containing detergents have not been evaluated for their ability to remove pesticides from fabrics.
- Use the highest water setting available, regardless of load size, to maximize dilution.
 - Use hot water. High temperatures disperse detergents and pesticides more efficiently than warm water, and especially more than cold water.
 - Use a pre-rinse/soak before initiating the wash cycle. Research shows this aids in removing pesticide residues.
 - Use an aggressive wash cycle that lasts at least 20 minutes. You may need to reset the wash cycle manually to achieve this with older and/or basic machines.
 - Use a high-speed spin. If this feature is not available, reset the machine manually to increase the spin time to further remove moisture and contaminants from the clothing.
 - Run one additional empty cycle without clothing, using detergent and hot water, before using the washer for household laundry.
 - If practical, dry clothes outside on a clothesline. Otherwise, dry clothes in a dryer or hang inside.



Figure 5. Bleach, ammonia, fabric softener and stain treatment products do not improve wash efficiency.

(NDSU photo)

Additional Points to Consider

Research on laundering pesticide-contaminated work clothing primarily was conducted in the 1980s and early 1990s. Since then, significant changes have occurred in pesticide toxicity and formulation, detergents, washing machines and clothing design/finishing.

Pesticide toxicity

Generally, pesticides used today are of lower toxicity and less persistent in the environment, and the amount of active ingredient necessary to control pests is significantly lower. Pesticide manufacturers and equipment suppliers also have made important advancements in formulation/packaging and engineering controls to further reduce applicator exposure.

Still, pesticides are considered toxic agents, and many pose a health risk to applicators and other individuals who may come in contact with them, especially if label instructions and best management practices are not followed. The development of a good laundering routine continues to play an important role in protecting the applicator and other members of the household.

Laundry detergents

Laundry detergents are different than the ones used in the above studies. The detergents no longer contain phosphates due to environmental concerns. Significant improvements in detergent performance have occurred in recent years, particularly in their ability to tolerate hard water, disperse contaminants and break down quickly after use. In addition, consumers are moving increasingly to liquid-based detergents because they are easier to use.

Also, manufacturers are selling encapsulated, highly concentrated liquid detergents in water-dissolvable pouches or pods. (Figure 6)

Pods have not been evaluated for efficacy in removing pesticides from contaminated clothing. Regardless of what detergent is employed, if it is used in conjunction with other proper laundering procedures, work clothes that are lightly or moderately contaminated can be cleaned to acceptable levels for future use.



Figure 6.

Dry detergent, liquid detergent and detergent-containing pods.

(NDSU photo)

Washing machine design

Since the 1990s, the trends have been toward:

- **Digital controls**, which enable a wide array of customizable wash settings (Figure 7). These features add multiple possibilities for improving pesticide removal from clothing. They include:
 - A programmable pre-soak cycle
 - A wash cycle that easily can be set for aggressive agitation and extended for an hour or more (Note: A more conventional wash cycle may last only 20 to 30 minutes.)
 - Customizable spin setting duration and speed
 - Rinse cycle duration and intensity can be varied
 Thus, the rinse cycle can be extended for several minutes and/or you can use an additional rinse cycle.

- **Steam-assisted cleaning, which traditionally has been used in commercial laundries**

It is becoming widely available to consumers. Steam cleaning has not been evaluated for removing pesticide contaminants, however.

- **Superheated water being used in some washers to sanitize heavily soiled garments**

A heating element in the machine takes water from the domestic hot water line and heats it to temperatures of 150 to 160 F. The feature is especially useful for cleaning heavily soiled diapers or reducing allergens in bedding. (Figure 8, Page 6) This option likely would improve the removal of pesticides from garments, but it has not been evaluated.



Figure 7.

Front-load washing machine with digital controls.

(NDSU photo)

Figure 8.
Digital control set
to "Sanitary."
(NDSU photo)



- **Front- or top-load machines without agitators**

These are becoming widely available, but comparisons have not been made regarding their relative efficiency in removing pesticide contaminants from clothing.

- **Basic, mechanically controlled machines posing challenges for cleaning pesticide-contaminated clothing (Figure 9)**

Often, high-temperature washes and rinses are not available in certain models, and water-saving settings may not be adjustable. In these situations, increasing the duration of the wash cycle or using two wash cycles partially may offset these limitations, but the efficacy of these substitutions have not been evaluated.

- **Water and energy conservation are national priorities**

In some drought-stricken parts of the country, water shortages mandate conservation, so the practices and principles outlined in this publication may conflict with these directives. Research has demonstrated that lowering water quantity and

temperature likely will reduce the effectiveness of pesticide removal from clothing. In these situations:

- Applicators should redouble efforts to avoid pesticide contamination during handling, loading, mixing and application of pesticides.
- To get the best wash efficiency, use loads closer to the 75 percent maximum capacity recommendation.
- Extending soak, wash and rinse cycle times with digitally controlled machines partially may offset the need for high temperatures and high water volumes, but no research has been done in this area.

Clothing Type and Design

Most of the recommendations listed in this publication have not been tested with some of the new "breathable" or synthetic fabrics. Likewise, many of the water/chemical-repellent finishes developed during the last two decades have not been evaluated. In these situations, users should check with the manufacturer of these products for cleaning recommendations.



Figure 9. Basic/mechanical control panel.
(NDSU photo)

For More Information on Pesticide Safety

Illinois

Pesticide Safety Education Program

University of Illinois Extension
1201 S. Dorner Drive
Urbana, IL 61801

Phone: (217) 244-2123

Web: www.pesticidesafety.illinois.edu

Iowa

Pesticide Safety Education Program

Iowa State University Extension and Outreach
109 Insectary
Ames, IA 50011-3140

Phone: (515) 294-1101

Web: www.extension.iastate.edu/psep

Michigan

Pesticide Safety Education Program

Michigan State University Extension
Food Safety & Toxicology Bldg.
1129 Farm Lane Road, Room B18
East Lansing, MI 48824-1302

Phone: (517) 353-5134

Web: www.pested.msu.edu

Minnesota

Pesticide Safety & Environmental Education

University of Minnesota Extension
495 Borlaug Hall
1991 Upper Buford Circle
St. Paul, MN 55108

Phone: (612) 625-9728

Web: www.extension.umn.edu/agriculture/pesticide-safety

Nebraska

Pesticide Safety Education Program

University of Nebraska-Lincoln Extension
377C Plant Sciences Hall
Lincoln, NE 68583-0971

Phone: (402) 472-1632

Web: <http://pested.unl.edu>

North Dakota

Pesticide Training and Certification Program

North Dakota State University Extension Service
Walster Hall 205
NDSU Dept. 7060, PO Box 6050
Fargo, North Dakota 58108-6050

Phone: (701) 231-7180

Web: <http://ndsupesticide.org>

Nationwide

National Pesticide Information Center

Oregon State University Extension and Outreach
310 Weniger Hall
Corvallis, OR 97331-6502

Phone: (800) 858-7378

Web: <http://npic.orst.edu>

Other State and Territory Pesticide Safety Education Programs

<http://npic.orst.edu/mlr.html>



The NDSU Extension Service does not endorse commercial products or companies even though reference may be made to trade names, trademarks or service names.

For more information on this and other topics, see www.ag.ndsu.edu

NDSU encourages you to use and share this content, but please do so under the conditions of our Creative Commons license. You may copy, distribute, transmit and adapt this work as long as you give full attribution, don't use the work for commercial purposes and share your resulting work similarly. For more information, visit www.ag.ndsu.edu/agcomm/creative-commons.

North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, race, religion, sex, sexual orientation, or status as a U.S. veteran. Direct inquiries to: Vice Provost for Faculty and Equity, 201 Old Main, (701) 231-7708 or Title IX/ADA Coordinator, 102 Old Main, (701) 231-6409.

County Commissions, NDSU and U.S. Department of Agriculture Cooperating.
This publication will be made available in alternative formats for people with disabilities upon request, (701) 231-7881.

25M-1-16

Maintaining Clothing and Personal Protective Equipment (recertification article)

At the end of each workday, wash all work clothes and personal protective equipment. Some items, such as clothes and coveralls, can be washed



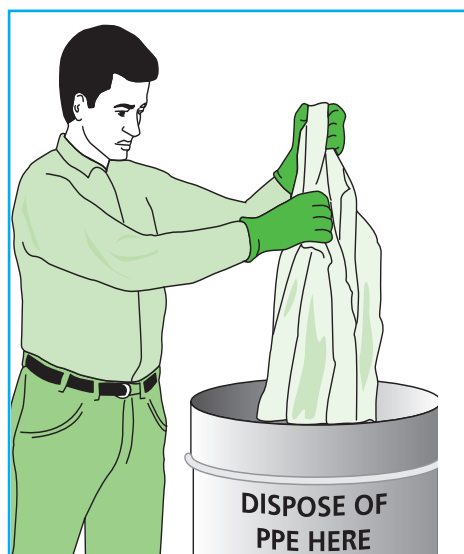
Wash pesticide-contaminated work clothes separately from other laundry.

using a washer and dryer. Other items, such as gloves, protective suits, goggles, aprons, boots, and eyewear, require hand washing. Wear protective gloves when handling contaminated items. Rinse and discard disposable items. Dispose of any nonreusable or contaminated item carefully to prevent cross-contamination or contamination of others who might handle the discarded item. Dispose of heavily contaminated items as household hazardous waste.

Nonwoven Clothing

Coveralls may be either a one-day disposable item or a reusable garment. For reusables, make sure to check the PPE manufacturer's use limitations and laundering instructions. Replace these garments regularly and at any sign of wear. If any PPE cannot be cleaned properly, dispose of it according to applicable federal, state, tribal, and local regulations. Follow manufacturers' instructions, if any, for the service life of reusable nonwoven garments. Pay close attention when reusing these items, and be ready to change them whenever you think that the inside surface may be contaminated.

If using disposable garments, render them unusable and discard. If they are heavily contaminated with high-risk pesticides, handle them appropriately and take them to a household hazardous waste facility.



Discard contaminated PPE in the appropriate container.

Continued on page 14

Continued from page 13

Boots and Gloves

Be sure to clean boots and gloves, even if they are worn only briefly. Before taking your gloves off, wash them thoroughly. Wash both the inside and outside of boots and gloves once removed. Inspect these items and discard if there is any sign of wear or if they leak. Hang or leave to dry. Gloves are not designed to be reused over and over again. Replace them often to ensure protection of your hands. Properly cared for, boots should last multiple seasons. Sun will degrade rubber materials quickly, so store gloves and boots out of the sun.



Jack Kelly Clark, University of California Statewide IPM Program

Clean goggles, face shields, and respirator bodies and facepieces in detergent and hot water.

Eyewear and Respirators

Most eyewear, respirator bodies, facepieces, and helmets are designed to be cleaned and reused. These items can last many years if they are good quality and are maintained according to the manufacturer's directions.

Respirators require more maintenance than most PPE. When you have finished using your respirator, remove and properly dispose of any expendable components, such as filters, cartridges, or canisters. Wash the facepiece according to the respirator manufacturer's directions. Take care to clean under and around gaskets and valves. Allow to air dry. Store cleaned respirators, as well as replacement purifying elements, in a clean, dry place that is not exposed to sunlight or extreme temperatures. Make sure that the rubber facepiece is not distorted when stored so that it maintains its shape.

Do not store any protective equipment—including respirators—with or near pesticides or other chemicals.

Wearing PPE can reduce the potential for dermal, inhalation, ocular, and oral exposure, thereby lowering the chances of pesticide injury, illness, or poisoning.

Consult the pesticide label for the minimum PPE required by law. In order to appropriately select and wear PPE, you must understand both its protections and its limitations. Then determine what protective equipment you need for the pesticide task at hand. Personal protective equipment reduces your exposure to pesticides but does not necessarily eliminate it. Maximize your safety by following certain good work practices when using pesticides.

Contact your Cooperative Extension pesticide safety education program for assistance in the selection, use, and maintenance of PPE for handling pesticides. Check the "Agricultural Use Requirements" box on the label and the WPS requirements for any other statements about PPE use in farms, forests, nurseries, or greenhouses.

* * *

Hawaii Landscape Plant Pest Guides

Hawai'i Landscape Plant Pest Guide is a series of five leaflets published by the College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa. The guides cover diseases, insects, and mites that can damage groundcovers (including grasses), ferns, shrubs, palms, and trees grown in Hawaii's landscapes. To help you identify problems, each features color photographs and brief descriptions which are followed up by a summary of techniques and strategies for managing the problems. Following are brief comments and links to downloadable versions of the guides.

*Hawai'i Landscape Plant Pest Guide: **Parasitic Seed Plants and Fungi*** (PD-110). Scot Nelson. January 2015. 4 pages.

<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-110.pdf>

This guide covers four groups of disease-causing agents: *Cassytha filiformis* & *Cuscuta* species (the green, yellow or orange stringy growth on live plants); fairy rings; *Korthalsella* species (Hawaiian mistletoe); and honeydew & sooty mold.

*Hawai'i Landscape Plant Pest Guide: **Plant Diseases*** (PD-105). Scot Nelson. January 2015. 11 pages.

<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-105.pdf>

This guide covers 14 groups of disease-causing agents: algal leaf spots; anthracnose; bacterial leaf spots & blights; black spot of rose; cankers; coconut heart rot; herbicide injury; leaf spots; powdery mildews; planting too deeply; root knot; root rots; rusts; and stem bleeding or gummosis of palm.

*Hawai'i Landscape Plant Pest Guide: **Chewing Insects*** (IP-37). Arnold Hara and Ruth Niino-DuPonte. February 2015. 11 pages.

<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/IP-37.pdf>

This guide covers 11 insects: banana moth caterpillar; beet armyworm; black twig or coffee borer; Chinese rose beetle; citrus leafminer; coconut leafroller; cypress roach or Pacific beetle cockroach; eucalyptus longhorned borer; green garden looper; monkeypod caterpillars; and New Guinea sugarcane weevil.

*Hawai'i Landscape Plant Pest Guide: **Sucking Insects*** (IP-36). Arnold Hara and Ruth Niino-DuPonte. February 2015. 16 pages.

<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/IP-35.pdf>

This guide covers eight insect types: aphids; foliar and root mealybugs; armored and soft scales; southern green stinkbug; spiraling whitefly; and thrips.

*Hawai'i Landscape Plant Pest Guide: **Mites and Gall-Forming Insects*** (IP-35). Arnold Hara and Ruth Niino-DuPonte. February 2015. 3 pages.

<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/IP-35.pdf>

This guide covers mites and insects: coconut mite; erythrina gall wasp; and hibiscus erineum mite.

A Summary of Revisions to the Worker Protection Standard—2015 (recertification article)

Article starts on the next page.

The recertification article is on the next five pages. It is a reprint of a leaflet titled A Summary of Revisions to the Worker Protection Standard—2015 (Frederick M. Fishel. University of Florida. December 2015).

The revisions apply in Hawaii unless superseded by current rules made specifically for Hawaii.

The original leaflet may be downloaded from this University of Florida webpage: <http://edis.ifas.ufl.edu/pi017>.

Continued from page 1

Expired or Expiring April 1–September 30, 2016

For users of the product **Dibrom® Concentrate** (Amvac Chemical; 5481-480)—to treat **plastic bait traps, fiberboard blocks, or similar dispensers, telephone or light poles or other inanimate objects, non-food tree trunks or limbs**—as permitted by the SLN label **HI-000005**—is not allowed on or after the expiration date **4/20/2016**.

For uses of the product **Prozap® Zinc Phosphide Oat Bait** (HACCO; 61282-14)—to treat **rangeland, pasture, uncultivated agricultural areas, and rural**

non-crop sites surrounding residential and resort areas—as permitted by the SLN label **HI-010001**—is not allowed on or after the expiration date **7/26/2016**.

For users of the product **Dupont™ Assure® II Herbicide** (DuPont; 352-541)—to treat **corn**—as permitted by the SLN label **HI-110001**—is not allowed on or after the expiration date **8/1/2016**.

For user of the product **GoalTender®** (Dow AgroSciences; 62719-447)—to treat **non-bearing pineapple**—as permitted by the SLN label **HI-070001**—is not allowed on or after the expiration date **8/17/2016**.

* * *

Hurricane Season in Hawaii starts June 1

June–November is hurricane season in Hawaii. This is when pesticide storage structures are more likely to sustain wind and flood damage. Consider moving pesticides, fertilizers, and fuels in low-lying areas to a safer storage on higher ground. Or, at least move any chemicals from the floor or low shelves to higher ones. Repair, strengthen or rebuild a storage structure if it's not ready to resist heavy rains, high winds, or flooding.

Here's a note from the Central Pacific Hurricane Center Tropical about preparing for tropical storms:

In Hawaii, mountainous terrain accelerates hurricane and tropical storm winds causing extremely high winds that can destroy buildings, structures, trees, vegetation and crops.

Heavy and prolonged rains can accompany all types of tropical cyclones including hurricanes, tropical storms, and tropical depressions. Even the weakest tropical depressions can bring torrential rains and flash flooding to the Hawaiian Islands.

When forming a disaster preparedness plan, consider each factor and how it could affect your family and property.

<http://www.prh.noaa.gov/cphc/> June 26, 2016

* * *

A Summary of Revisions to the Worker Protection Standard—2015¹

Frederick M. Fishel²

This document highlights the changes to the Worker Protection Standard (WPS) since it became a federal regulation in 1992 and became fully implemented in 1995. This fact sheet summarizes those changes through November 2015.

Background

In 1992, the US Environmental Protection Agency (EPA) issued a comprehensive regulation called the Worker Protection Standard for Agricultural Pesticides (WPS). The WPS covers pesticides used in the outdoor and enclosed space production of plants on farms, forests, and nurseries, as well as greenhouses. The WPS requires agricultural employers to take steps to reduce pesticide-related risks when agricultural workers and pesticide handlers are exposed to these pesticides. The EPA has made several changes to the WPS since it was fully implemented in 1995. On November 2, 2015, the EPA revised the WPS, making significant changes to the rule's requirements. Most of the revised provisions will become effective January 2, 2017; there are four provisions that are delayed until January 2, 2018. The EPA intends to revise the current "How to Comply Manual" to provide an updated resource; it will be posted on their website when it becomes available.

Training

It is required that the full safety training for workers and handlers be conducted annually. Previously, the training was necessary only once every five years. There is no grace period for when workers may be trained; they must be trained prior to working in an area where a pesticide has been used or a restricted-entry interval (REI) has been in effect in the past 30 days. Formerly, there was a five-day grace period for the required training. For handlers, as previously required, training must be conducted prior to performing any handling activity. Only those who are certified applicators, state/tribal/federal-approved trainers, and persons who have completed an EPA-approved train-the-trainer course are qualified to administer training. The training content for both workers and handlers will be expanded to include more items and is expected to be implemented in January 2018. Formerly, there was no requirement for keeping records of the training; it was strictly voluntary (Figure 1). The revised standard dictates that records be kept for 2 years, and a copy of the training record must be provided to workers and handlers upon their request.

Hazard Communication

Employers must display application information and safety data sheets (SDSs) at a central location within 24 hours of the end of a pesticide application and before workers enter the treated area (Figure 2). The application information and

1. This document is PI261, one of a series of the Agronomy Department, UF/IFAS Extension. Original publication date December 2015. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Frederick M. Fishel, professor, Agronomy Department, and director, Pesticide Information Office; UF/IFAS Extension, Gainesville, FL 32611.

SDSs must be displayed for 30 days after the REI expires, must be kept for 2 years from the end of the REI, and must be made available to workers, handlers, designated representatives (identified as such in writing), or treating medical personnel upon request. Previously, the posting and recordkeeping of SDSs was not required.

WORKERS/ HANDLERS WPS TRAINING ATTENDANCE SHEET

Name of Agricultural Facility:		Training date:
Address:		
Trainer's Information Please provide the following:		WPS Training Resource Check mark (✓) all that apply:
Trainer's Name:		☐ Audiovisual EPA Approved training Material (VHS, DVD or CD-ROM format)
TTT Certification date and/or Certified Applicator License No.:		☐ EPA flip chart materials
Trainer's Signature:		☐ Extension Service training session
		☐ Trainer session
		☐ Other _____
Trained Workers/ Handlers Information (Información sobre el Obrero/Manejador Entrenado)		
Print Full Name (Nombre Completo)	Specify the classification: (Especifique su clasificación) W= Worker (Trabajador) & H= Handler (Manejador)	Signature (Firma)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

WPS PESTICIDE SAFETY TRAINING

- Agricultural workers must be trained before the 8th work day of entry into a treated area on the Agricultural Establishment, where and in what form pesticides may be encountered during work activities. (40CFR section 179.120).
- Agricultural handlers must be trained before any handling activity is performed. (40CFR section 179.220).
- Workers and handlers must each be trained at least once every 5 years. You may keep this record as training evidence.

The entire copies of this suggested form please e-mail: wpstools@ufl.edu or contact (352) 419-0028

Figure 1. Keeping training records is a new WPS requirement.
Credits: UF/IFAS Pesticide Information Office



Figure 2. Posting SDS is a new WPS requirement.
Credits: UF/IFAS Pesticide Information Office

Notification of Treated Area

Warning signs must be posted if the REI is greater than 48 hours for outdoor applications or greater than 4 hours

for enclosed space applications, including greenhouses. Otherwise, warning signs can either be posted or delivered through oral notification unless the product label requires both forms of notification. Formerly, there was an option to give oral notification, regardless of the REI's duration for outdoor applications made to farms, forests, and nurseries while all applications made in greenhouses required signs to be posted. The required content for the WPS field warning signs remains unchanged; the red circle containing a stern-faced man with an upraised hand is still used (Figure 3). Agricultural employers must provide application information on treated areas that the commercial pesticide handler may enter (or walk within ¼ mile of). Commercial handler employers must notify agricultural employers before the application begins for certain changes in the application plan and within 2 hours of the end of the application for most other changes in the plan, unless the only change was less than 1 hour difference in application time.



Figure 3. Warning sign design remains unchanged under the revised WPS.

Credits: UF/IFAS Pesticide Information Office

Minimum Age

Previously, there was no minimum age for handlers and early-entry workers; however, the revised WPS mandates that handlers and early-entry workers must be at least 18 years old. Members of the owner's immediate family are exempt from this and most other requirements of the WPS.

Entry Restrictions during Applications for Outdoor Production

Agricultural employers must prohibit entry to some outdoor areas during outdoor applications. For all outdoor areas, no entry is allowed into the treated area or the application exclusion zone, which is an area of up to 100 feet around the application equipment, during pesticide application on farms, forests, and nurseries. The size of the application exclusion zone depends on the type of application. Formerly, application exclusion zones did not exist in farms and forests, although the 0–100-foot exclusion zone has always been in effect for nursery applications.

Suspended Applications

Under certain circumstances, handlers must suspend applications. If a worker or other person is in the application exclusion zone, the application must be suspended; however, previously there were no requirements to suspend applications. Handlers must always apply pesticides in a manner that prevents workers from coming into contact with the pesticide, either directly or through drift.

Exemptions and Exceptions

The certified crop advisors and their employees must use pesticide product label-required personal protective equipment (PPE) while working in a field during an REI. The former WPS language allowed certified crop advisors to choose PPE for themselves and their employees when working in a field during an REI. They were also exempted from providing decontamination supplies and emergency assistance for themselves and employees. Under the revised WPS, certified crop advisors may still make decisions for themselves about what PPE to wear and whether to carry decontamination supplies, but their employees are no longer exempt. However, the revised WPS now permits all crop advisors (certified or non-certified) and their employees who perform crop advising tasks during the REI to choose between the PPE for handlers, the PPE for early-entry workers, or a “generic” or “universal” set of PPE that can be used in all situations (this set of PPE consists of coveralls, shoes and socks, gloves made of any waterproof material, and eye protection if the labeling of the applied pesticide requires protective eyewear for handlers). The revised WPS also requires that early-entry workers be orally notified of application specifics, tasks to be performed, conditions of the early-entry exception, and hazard information from the pesticide product label.

Basic Pesticide Safety Information

As previously required, safety information must be displayed at a central location on the agricultural establishment (Figure 4). The revised standard now requires that, in addition to displaying information at a central location, this information must also be displayed at sites where decontamination supplies are located, if the decontamination supplies are at a permanent site or at a location with 11 or more workers or handlers. This information may be displayed in any format. It does not have to be a poster as in the past; however, these seven concepts about preventing pesticides from entering the body must be included:

- “Avoid getting on your skin or into your body any pesticides that may be on plants and soil, in irrigation water, or drifting from nearby applications.
- Wash before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Wear work clothing that protects your body from pesticide residues, such as long-sleeved shirts, long pants, shoes, socks, and hats or scarves.
- Wash or shower with soap and water, shampoo your hair, and put on clean clothes after work.
- Wash work clothes separately from other clothes before wearing them again.
- Wash immediately in the nearest clean water if pesticides are spilled or sprayed on your body. As soon as possible, shower, shampoo, and change into clean clothes.
- Follow directions about keeping out of treated or restricted areas” (EPA 2015).



Figure 4. Information displayed at a central location on an agricultural establishment.

Credits: UF/IFAS Pesticide Information Office

In addition, the following must be included in the safety display:

- Instructions for employees to seek medical attention as soon as possible if they have been poisoned, injured, or made ill by pesticides.
- The name, address, and telephone number of the state or tribal regulatory authority.
- The name, address, and telephone number of a nearby operating medical care facility.

The basic pesticide safety display revision will be required after January 2, 2018.

Personal Protective Equipment (PPE)

This latest revision to the WPS will incorporate some of the Occupational Safety and Health Administration (OSHA) regulations for respirator use (Figure 5). Agricultural employers were already required to provide the label-required respiratory protection, but now they will be required to provide handlers with respirators, fit testing, training, and medical evaluation whenever the pesticide product label requires the handler to wear a respirator. This amendment will also now require a recordkeeping of the completion of the fit test, training, and medical evaluation. Previously, the WPS did not require fit testing, training, or a medical evaluation for respirator wearers, and no recordkeeping was required.



Figure 5. Respirator use must conform to OSHA standards in the revised WPS.

Credits: UF/IFAS Pesticide Information Office

In the past, exceptions to the labeling-specified PPE existed for handlers when using closed systems, including enclosed cabs. Under the revised WPS, a closed system must meet a broad performance-based standard and basic operating standards. This is interpreted to mean that handlers must be provided with written operating instructions and training in the use of the closed system. Also, in enclosed cabs, handlers must wear the labeling-specified respiratory protection except when the only labeling-specified respiratory protection is a particulate filtering facepiece respirator (National Institute of Occupational Safety and Health approval number prefix TC-84A). The PPE requirement exception in enclosed cabs remains unchanged.

If product labeling requires eye protection, pilots in open cockpits may wear a helmet with lowered face shield instead of label-required eye protection. As stated in the previous WPS, gloves are optional when entering and leaving aircraft unless required by the product label.

Decontamination Supplies

A new provision now specifies the quantity of water that must be available at the beginning of the work period for routine washing and emergency eye flushing: 1 gallon for each worker and 3 gallons for each handler and early-entry worker. Those quantities must be available regardless of the use of natural waters for decontamination. As an element in the mandated safety training, workers and handlers must be trained to use the nearest clean water source in case of emergency. Specific eye washing materials and directions for handlers are defined in the revised WPS. A system capable of delivering 0.4 gallons per minute for 15 minutes, or allowing 6 gallons of water to flow gently for about 15 minutes at a mix/load site is required if handlers use products requiring eye protection or use a pressurized closed system (Figure 6). One pint of water in a portable container must be available to each handler applying pesticides if eye protection is required by product labeling.

Emergency Assistance

As the previous WPS stated, employers should provide prompt transportation to a medical facility for emergencies (Figure 7). The updated WPS stipulates that employers must provide the product SDS and other information, including the name, EPA registration number, and active ingredient of the product, as well as the circumstances leading to the exposure to the medical personnel treating the victim.



Figure 6. Eye-washing capacities at facilities with mix/load sites are specified in the revised WPS.

Credits: UF/IFAS Pesticide Information Office



Figure 7. Prompt transportation to a medical facility is required for accident victims.

Credits: UF/IFAS Pesticide Information Office

Revised/New WPS Definitions

- **Immediate family:** expanded from spouse, parents, stepparents, foster parents, children, stepchildren, foster children, brothers, and sisters to now also include all in-laws, grandparents, grandchildren, aunts, uncles, nieces, nephews, and first cousins.
- **Enclosed space production:** production that is indoors or in a structure or space that is covered in whole or in part by any nonporous covering and that is large enough to permit a person to enter.
- **Employ:** to obtain, directly or through a labor contractor, the services of a person in exchange for a salary or wages, including piece-rate wages, without regard to who may pay or who may receive the salary or wages. It includes obtaining the services of a self-employed person, an

independent contractor, or a person compensated by a third party, except that it does not include an agricultural employer obtaining the services of a handler through a commercial pesticide handler employer or a commercial pesticide handling establishment. Previously, there was no definition of “employ,” although some aspects of employment were covered in the terms, “agricultural employer” and “handler employer.”

Additional Information

Florida Department of Agriculture and Consumer Services, Division of AES, Bureau of Licensing and Enforcement: Agricultural Worker Safety. <http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Environmental-Services/Business-Services/Agricultural-Worker-Safety> (accessed December 2015).

References

United States Environmental Protection Agency. 2015, *Office of Pesticide Programs: Revised Worker Protection Standard*. <http://www.epa.gov/pesticide-worker-safety/revisions-worker-protection-standard> (accessed December 2015).

Illustrated Glossary (recertification article)

The definitions in this glossary are intended to help you understand the terms used on pesticide labels. Other definitions may be available for these terms.

Rinsate: water or another liquid used to rinse out pesticide remaining in an empty container being made ready for disposal.

Image from University of Kentucky



Example from a fungicide label:

*Fill the container $\frac{1}{4}$ full with water and re-cap. Shake for 10 seconds. Pour **rinsate** into application equipment or a mix tank or store **rinsate** for later use or disposal.*

Washwater: water used to clean contaminated equipment.

Image from University of Kentucky



Example from a fungicide label:

*For terrestrial uses: Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the main high water mark. Drift and run off may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment **wash water** or **rinsate**.*

Placard: A notice for public display, like a small card, sign, or plaque fixed to a wall.

Shipping container image from U.S. Coast Guard. Yellow circle and placard added.



Example from the label a fumigant:

*Upon receipt of the railcar, railroad boxcars, shipping containers and other transport vehicles, a Certified Applicator and/or persons with documented, authorized training must supervise the aeration process and removal of the **placards**.*

Continued on page 23

Continued from page 22

Nonrefillable container: a pesticide container designed and constructed for one-time use and which the chemical manufacturer does not intend to be filled again for *sale* or *distribution*.



Example from the label of an insecticide:

*For rigid **nonrefillable** containers 5 gallons or less: Container Disposal: Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill or by incineration, if allowed by state and local authorities.*

WARNING!

State of Hawaii Department of Health prohibits burning of containers in the open.

Consult the Department's Clean Air Branch for details.

health.hawaii.gov/cab/files/2013/05/openburningfaq_2012.pdf

Refillable container: a pesticide container which the chemical manufacturer intends to be filled with the pesticide product more than once for *sale* or *distribution*.

Shipping container image from U.S. Coast Guard. Yellow circle and placard added.



Example from the label of a fumigant:

*Cylinder Return: **Refillable container.** When cylinder is empty, close valve, screw safety cap onto valve outlet and replace protection bonnet. Follow registrant's instructions for return of empty or partially empty cylinders. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose. Always follow the proper cylinder handling directions.*

Note to our newsletter readers: In this example, the word "registrant" refers to the company that makes the pesticide product.

Stover: the leaves, stalks, and cobs of corn plants left in a field after harvesting the grain and sometimes used to feed livestock.

<http://www.county-guide.ca/2015/01/20/rolling-in-corn-stover/45646/>



Example from the label of a herbicide used to treat "field corn":

*Do not graze, feed forage, grain or fodder (**stover**) from treated areas to livestock within 30 days of [herbicide product name] application.*

Articles in Previous Issues

Recertification articles are underlined.

You may download the issues free of charge from <http://pestworld.stjohn.hawaii.edu/pat/oldissue.html>.

2014 October–December issue

- Regulatory Updates, p.1
- Preparing an effective pesticide spray mixture: part one, p.2 (recertification article)
- Preparing an effective pesticide spray mixture: part two, p.7 (recertification article)
- Illustrated Glossary, p.6 (recertification article), for these terms: *clod*, *precipitate*, *direct reading detection device*, and *barrier laminate*
- Cancellation of selected d-Con® rodenticide products, p.16
- Coffee berry borer found on Oahu, p.14
- Coconut rhinoceros beetle update, p. 15
- Previous recertification articles, p.19.

2015 January–March issue

- Regulatory Updates, p.1
- Adjuvants: making pesticides more effective, p.2 (recertification article)
- Adjuvants: what to add and when, p.8 (recertification article)
- Paraquat dichloride: one sip can kill, p.12 (recertification article)
- Illustrated Glossary, p.17 (recertification article), for these terms: *tiller*, *canopy*, *interiorscape*, *space spray*
- EPA registers new alternative to neonicotinoids, p.14
- Hawaii turf pest management survey, p.16
- Previous recertification articles, p.19

2015 April–December issue

- Regulatory Updates, p.1
- Engineering Controls for Pesticide Exposure, p.2 (recertification article)
- Reducing Spray Drift: Windbreaks and Buffer Zones, p.7 (recertification article)
- Labeling Secondary Containers and Service Containers, p.10 (recertification article)
- Illustrated Glossary, p.18 (recertification article), for these terms: *organic-vapor-removing cartridge*, *prefilter*, *canister*, *lamina*, *petiole*, *pressure rinsing nozzle*
- Previous recertification articles, p.20

2016 January–March issue

- Regulatory Updates, p.1
- Rodents and Rodent Control in Hawaii, p.3 (recertification article)
- Selecting a prefilter for your respirator, p.8 (recertification article)
- Pesticide shelf life, p.10 (recertification article)
- Pesticide storage and security, p.12 (recertification article)
- Illustrated glossary, p.26 (recertification article), for these terms: *foundation*, *footing (footer)*, *slab*, *crawl space*, *stoop*
- Issues with “least toxic pesticides” and applied as “last resort”, p.15
- Scope of illness tied to 2 common herbicides, p.18
- How to manage herbicide resistance, p.20
- Spraying by the numbers, p.21
- The use of economic thresholds in integrated pest management: a difference of opinion, p.22
- Previous recertification articles, p.28

* * *

This newsletter is published by the College of Tropical Agriculture and Human Resources' *Pesticide Risk Reduction Education* program. • <http://pestworld.stjohn.hawaii.edu/epp/pat.html> • cynagami@hawaii.edu • 808-956-6007 • Pesticide Safety Education Program, Department of Plant and Environmental Protection Sciences, University of Hawaii at Manoa, 3190 Maile Way Room 307, Honolulu, HI 96822.

Mention of a trademark, company, or proprietary name in this newsletter does not constitute an endorsement, guarantee, or warranty by the University of Hawaii, College of Tropical Agriculture and Human Resources, Cooperative Extension Service or its employees and does not imply recommendations to the exclusion of other suitable products or companies.

CAUTION! Pesticide use is governed by state and federal regulations. Pesticides and pesticide uses mentioned in this newsletter may not be approved for Hawaii. They are mentioned for information purposes only and should not be considered as recommendations. Read the pesticide's labeling to ensure that the intended use is included on it and follow all labeling directions.