

# Pesticide Update



Structural Pest Control and Pesticides Division, [www.ncagr.com/pesticide/](http://www.ncagr.com/pesticide/)

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## N.C. Pesticide Board Adopts New Pesticide Regulations

### New Record Keeping Requirements: Worker Protection Standards For Agricultural Pesticide Applications

Effective May 1, 2009 under NC Pesticide Regulations, Section .1800 WORKER PROTECTION STANDARDS FOR AGRICULTURAL PESTICIDES, new regulation .1807 requires:

#### 02 NCAC 09L .1807 SPECIFIC INFORMATION ABOUT APPLICATIONS

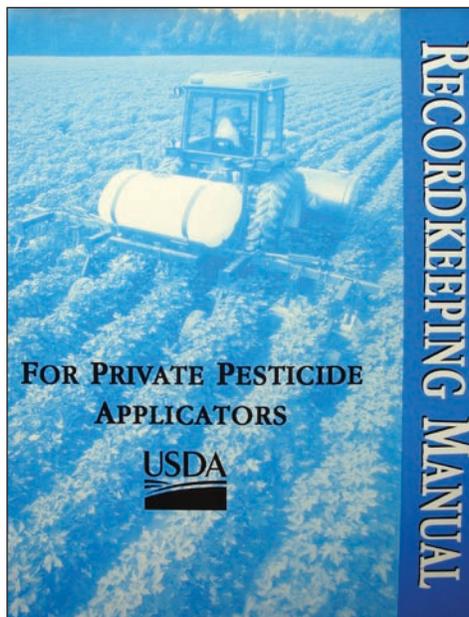
(a) Concerning application information requirements contained in Sections 170.122 and 170.222 the following is also required to be completed by the agricultural employer:

(1) In addition to the requirements of Sections 170.122(c)(3), and 170.222(c)(3), the specific time of day when each pesticide application was completed must be recorded immediately upon completion of the application. Each day of the application shall be recorded as a separate record.

(2) After the application information referenced in 1807(a)(1) and the other information in Sections 170.122(c) and 170.222(c) has been displayed for the required period of time in Section 170.122(b) and 170.222(b), the agricultural employer shall maintain the information for a period of two years from the specific time of day when each pesticide application was completed. Such information shall be available for inspection and copying by the Board or its agents upon their request.

(b) In addition to information contained in Section 170.224(b), the handler employer must make the agricultural owner aware of the specific time of day when each pesticide application was completed. The agricultural employer shall display the information immediately and shall make it part of the record required to be maintained in paragraph (a)(1) and (2) of this part.

The changes will now require growers making applications that fall under the scope of the Worker Protection Standard to add the actual "end time" of application to the records, as shown below in the example. This is in addition to the "time of the application" that is required to be posted before the application takes place under the current WPS Regulations. Also



For an example showing how to comply with the new regulations, and a sample record keeping form, see page 4.

each day of applications shall be recorded as a separate application record.

The application information must also now be maintained for a period of two years, this coincides with the USDA Requirements for Restricted-Use Pesticides. So to comply with the regulations growers must keep the information posted at a central location for 30 days after the re-entry period expires (if workers are present on their establishment) and then maintain the records for a period of two years to allow for inspection by Pesticide Inspectors with NCDA&CS.

Revised record keeping forms may be downloaded from the Structural Pest Control and Pesticides Division's web page <http://www.ncagr.gov/SPCAP/pesticides/Cmfo.htm#RecordKeeping> or from the N.C. Cooperative Extension Service.

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# New Bulk Pesticide Containment Regulations

By Mike Mitchell,  
Pesticide Environmental  
Investigative Specialist,  
and NCDA&CS



The United States Environmental Protection Agency adopted a new Pesticide Container and Containment Rule. On January 13, 2009, the North Carolina Pesticide Board adopted, by reference, the containment portion of the Rule, thereby making it also a state regulation. These regulations will become effective on August 17, 2009.

## Who Must Comply?

Refilling establishments, custom blenders, and commercial applicators (applies pesticides for compensation) must comply if they handle agricultural pesticides. Farmers will not be affected unless they fall into one of the above categories. Furthermore, this regulation only applies if you have agricultural pesticides stored in stationary tanks designed to hold undivided quantities equal to or greater than 500 gallons of liquid pesticides or equal to or greater than 4,000 pounds of dry pesticides. Or, if you own or operate an agriculture pesticide establishment that repackages such pesticides and whose main business is retail sales (i.e. greater than 50 % of total annual revenue generated from retail sales).

## Why New Regulations

The new regulations were developed to protect the environment from agricultural pesticide releases at bulk storage sites and also from agricultural pesticide spills and leaks resulting from pesticide refilling and dispensing operations. This protection is achieved by the construction and maintenance of secondary containment units and/or pads.

## What Is Covered?

The new regulations address both secondary containment for stationary containers, and containment pads for pesticide dispensing areas.

Stationary containers in affected facilities (see Who Must Comply) must have secondary containment. Multiple stationary containers may be protected within one containment unit. A stationary container

is defined as a container that is fixed at a facility, or a non-stationary container that remains at a facility for at least 30 consecutive days and contains pesticide during that time. The new regulation exempts some stationary containers. Stationary containers exempted in the new regulation include: empty containers, containers holding only rinsate or wash water (and so labeled); containers holding pesticides which are gaseous at atmospheric temperature and pressure; and containers dedicated to non-pesticide use (and so labeled).

Dispensing areas in affected facilities must have containment pads. Containment pads are required if refillable containers are being emptied, cleaned or rinsed; if agricultural pesticides are dispensed from a transport vehicle for purposes of refilling a refillable container; if agricultural pesticides are dispensed from any other container for the purpose of refilling a refillable container for sale or distribution; or if agricultural pesticides are dispensed from a stationary container designed to hold undivided quantities equal to or greater than 500 gallons liquid or 4,000 pounds dry for any purpose.

There are also sections of the rule that mandate operational procedures. The owner or operator of the facility must manage all structures in a manner that prevents pesticides and mixtures from escaping. All spills and leaks must be collected and recovered in a manner that ensures protection of human health and the environment. All cleanup must occur no later than the end of the day and all pesticides and materials containing pesticide residues that are collected must be managed according to label instructions and applicable Federal, State and

local laws and regulations. Additionally, all transfers of pesticides between containers and/or vehicles must be attended at all times and all lockable valves must be locked when unattended. Locking an entire facility will satisfy this requirement.

The new rule also addresses requirements for inspection, maintenance, and recordkeeping. All structures and containers must be inspected at least

monthly whenever pesticides are present. If upon inspection it is determined that repairs are needed, they must be initiated no later than the end of the day and completed repairs must be affected within a time frame that is reasonable taking into account the availability of materials, staff and equipment. No additional pesticides may be stored in or on the structure until suitable repairs have been made. In addition to applicable Pesticide Producer Establishment record keeping requirements, facilities must also keep records of inspections and maintenance for three years. These records must include the name of the person conducting the inspection and the maintenance, date of inspections and maintenance, conditions noted and maintenance performed. Also, records of the construction date of structures must be kept for as long as the structure is in use, and for three years afterwards.

## The Complete Story

This article is only a brief overview of the new containment rule. For additional information, or for specific details regarding the new rule, contact Mike Mitchell, NCDA&CS at 919-733-3556 ext. 275 or visit the EPA's websites shown below for additional information.

[http://www.epa.gov/pesticides/regulating/regulations\\_at\\_a\\_glance.htm](http://www.epa.gov/pesticides/regulating/regulations_at_a_glance.htm)

(Note: the website shown above outlines the entire rule. See Table 7 for information regarding Containment Structures)

<http://www.epa.gov/pesticides/regulating/containers.htm>

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=93dee353f2abe7469a3a51f5b2fb7a7c&rgn=div6&view=text&node=40:23.0.1.1.15.5&idno=40>

# New Record Keeping Requirements:

Below is an example showing how to comply with the new regulations.

FIELD ID/LOCATION: 52-48 Old creek Field (1)

Applicator Name and Certification Number	Mo/Day/Year & Time	EPA Reg. Number	Active Ingredients	Brand Name	Crop, Commodity, Stored Product, or Site
Bob B. Smith 200028265	5/3/09 (3)(a) 10am (3)(b) end time: 2:00pm	241-337	Pendimethalin	Prow/3.3EC	cotton
	5/3/09 (3)(a) 10am (3)(b) end time: 2:00pm	100-642	Fluometuron	Cotoran 4L	cotton
(2)	(3)	(4)	(5)	(6)	(7)

(1) Identify the location of the application (not the farm or business). A field may be identified on a farm map, by a USDA map and number, by a common field name (for example, 52-48 Old Creek Field), or by a legal description. If the location treated is a greenhouse or storage facility, give it a unique name or number. If treating a section of a greenhouse, record the section or bed as part of the greenhouse location.

(2) If the name and certification number are the same as the name and certification number of the person on the applicator information form on page 4, then you may record the letter listed for the applicator. If anyone else is applying the pesticide, record the applicator's name and certification number.

(3) Fill in the month, day, and year of application.

(a) WPS requires you to post the time the application is to be made prior to the application, so record time here.

(b) You must now add the actual end time of the application to the application information.

For more information please contact the NCDA & CS – Pesticide Section, Compliance Monitoring & Field Operations at (919) 733-3556.

## Recordkeeping Form for the USDA Restricted-Use Pesticides Regulation and the Worker Protection Standard

Maintain records of all pesticide applications for a minimum of 2 years.

Field ID/location of Treated Area (1)  \_\_\_\_\_

(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
 Date (mo/day/yr)	 Time Planned  Time Completed	 Restricted Entry Interval (REI)	 Crop or Commodity Treated	 Brand Name(s)	 EPA Registration Number(s)	 Active Ingredient(s)	Size of Area Treated	Total Amount Applied**	Applicator's Name & Certification Number
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								

 Worker Protection Standard (WPS) information must be posted *before* pesticide application and remain posted for 30 days after the end of the Restricted Entry Interval (REI). After this time the records are required to be maintained for 2 years. All other information must be recorded within 14 days of application. If you apply a tank mix of pesticides with different REIs, write down the longest REI.

\*\*Multiply the rate of application that you used by Size of Area Treated (item 9) to get Total Amount Applied (item 10). The Total Amount Applied is not the quantity after water or a carrier is added.

Note: For applications made to less than 1/10-acre, indicate "spot treatment" within Crop or Commodity Treated (item 5) and record the Location of Treated Area (item 1). Record the Date, Brand Name, EPA Reg. No., and Total Amount Applied (items 2, 6, 7, and 10).

# New Record Keeping Requirements For Aerial Applicators

Effective May 1, 2009 the record keeping requirements for aerial applicators have been updated to include the time each application was completed and each day of application recorded as a separate record. Regulation changes are notated in **red** in below:

## SECTION .1000 - AERIAL APPLICATION OF PESTICIDES

### 02 NCAC 09L .1002 GENERAL REQUIREMENTS

(a) All agricultural aircraft operations in North Carolina shall comply with the Federal Occupational Safety and Health Act of 1971 (OSHA), the North Carolina Occupational Safety and Health Law, all regulations promulgated thereunder and the Federal Aviation Regulations part 137. In any case of conflict, a provision of the aforementioned authorities takes precedence over any of these Rules.

(b) Each aerial application business shall have a licensed contractor. The contractor shall be responsible for the compliance of the business with the North Carolina Pesticide Law of 1971 and all regulations promulgated thereunder except where the responsibility is specifically designated to another person(s) by these Rules.

(c) All agricultural aircraft operations (pilot or contractor) shall keep a written record to be completed within 72 hours after each application. This requirement must be fulfilled **as soon as** requested by an employee of the Pesticide Section for the purposes of a pesticide incident investigation. The record shall show the following:

- (1) name of contractor;
- (2) name and address of the person for whom the pesticide was applied;
- (3) identification of farm or land sites treated with pesticide(s);
- (4) name of crop which was treated;
- (5) total number of acres treated;
- (6) **the year, month, date, and the specific time of day when each pesticide application was completed;**
- (7) the brand name of the pesticide(s) and EPA registration number;
- (8) amount of formulated product or active material applied per acre (must specify);
- (9) total gallons or pounds per acre of



the final tank mix applied per acre;

(10) name of pilot;

(11) signature of person completing this record.

(d) **Each day of application shall be recorded as a separate record.**

(e) The pilot shall, prior to application, learn and confirm:

- (1) the boundaries and exact location of the target area(s),
- (2) the identity of nontarget areas and safety hazards located on or adjacent to the target areas.

(f) Spray and spreading equipment shall be rinsed after each agricultural aircraft operation except when the next agricultural aircraft operation will be made using the same pesticide, or if another pesticide, one which by its manufacturer's recommendations is compatible with that previously in the equipment, and will not result in any adverse effects or illegal residues. Rinsing shall be conducted in an area where an environmental hazard will not be created by the drainage or disposal of waste materials and conducted with methods which will not create an environmental or human hazard.

(g) During application, the flow and mixture of the pesticide(s) shall be uniform. Pilots and contractors shall utilize equipment which will maintain a uniform mixture and flow during application.

(h) Pilots and contractors shall use and operate, in any agricultural aircraft operation, aircraft equipped with spray or spreading equipment suited, according to its manufacturer's recommendations for the pesticide(s) to be applied. All aerial spray

or spreading equipment shall be free of leaks and shall have a positive shutoff system to prevent leaking and dissemination of pesticides on any nontarget areas over which the flight is made. Such equipment shall not allow spillage, dripping and backflow or create a hazard from vapors or drift.

(i) The loading area shall be kept reasonably free of pesticide contamination.

(j) No pesticide(s) shall be applied by an aerial applicator while any persons other than those assisting in the application are in the target area.

(k) The shape of the tank or hopper of the spray or spreading equipment shall be such as to allow complete drainage during flight and on ground.

(l) The contractor or pilot shall immediately notify the Secretary of the Board, or designated alternate, of any emergency or accidental release of pesticide(s) from the application or auxiliary equipment. They shall provide the following information:

- (1) the name of the pilot,
- (2) the contractor involved,
- (3) the name of the property owner or operator,
- (4) the location of the incident,
- (5) the name of the pesticide,
- (6) the estimated amount of pesticide involved,
- (7) the estimated size of the area that received the spill,
- (8) the description of what is located within 300 feet from the edge of the spill in all directions,
- (9) the number of humans or animals known to have been contaminated,
- (10) the weather conditions at the site of the emergency or accidental release of pesticide(s).

*History Note: Authority G.S. 143-458; 143-463; 143-466;*

*Eff. July 2, 1976;*

*Amended Eff. May 1, 2009; February 1, 1989; January 1, 1985; August 1, 1982; March 1, 1981.*

**Also effective May 1, 2009 under NC Pesticide Regulations, Section .1800**

*Please see Aerial Applicators, page 6*

# New Bulk Storage Regulations

On January 13, 2009, the North Carolina Pesticide Board adopted, by reference the containment portion of the United States Environmental Protection Agency's new Pesticide Container and Containment Rule, thereby making it also a state regulation. This regulation will become effective on August 17, 2009. Regulation changes are notated in **red** in below:

## 02 NCAC 09L .0810 ADOPTION BY REFERENCE

The North Carolina Pesticide Board hereby adopts by reference, including subsequent amendments, Part 165 of Title 40: Protection of Environment of the Code of Federal Regulations, entitled "Pesticide Management and Disposal Subpart E –Standards for Pesticide Containment Structures."

Copies of this material may be obtained at no cost from the U.S. Government Printing Office website, [www.gpoaccess.gov/cfr/index.html](http://www.gpoaccess.gov/cfr/index.html).

*History Note:* Authority G.S. 143-441; 143-461; Eff. April 1, 2009.

## 02 NCAC 09L .1901 DEFINITIONS

All specific words or terms used in this Section other than those defined in this Rule shall have the same definitions as shown in the North Carolina Pesticide Law of 1971, G.S. 143-460. The rules contained in this Section shall be deemed to be minimum for storage.

(7) Bulk Storage. Commercial Storage of any pesticide held in stationary pesticide containers designed to hold undivided quantities equal to or greater than 500 gallons (1,890 liters) of liquid pesticide or equal to or greater than 4,000 pounds (1,818 kilograms) of dry pesticide are subject to the regulations in this Rule unless any of the following conditions exists:

- (a) The container is empty, that is, all pesticide that can be removed by the methods such as draining, pumping, or aspirating has been removed (whether or not the container has been rinsed or washed).
- (b) The container holds only pesticide rinsates or wash waters, and is labeled accordingly.
- (c) The container holds only pesticides which would be gaseous when released at atmospheric temperature and pressure.
- (d) The container is dedicated to non-pesticide use, and is labeled accordingly.

*History Note:* Authority G.S. 143-437; 143-441; 143-461; 143-466; Eff. January 1, 1984; Amended Eff. April 1, 2009; November 1, 1989; November 1, 1988.



## NEW STATE BULK STORAGE REGULATIONS - are now found in the Sub-Section .1914

### 02 NCAC 09L .1914 BULK STORAGE REQUIREMENTS

(a) Outlets, filler and access ports shall be locked at all times when not in use. Keys to the outlet, filler and access ports shall be in the possession of the purchaser and authorized employees only. Locks on ports are not required if bulk tanks are stored inside a facility utilizing security precautions that prevent unauthorized access to the bulk pesticide storage area.

(b) All bulk pesticide storage tanks must display the appropriate signal word as shown on the label on all sides exposed to view. The words shall be either stenciled directly on the containers or storage tanks or placed on a sign of durable construction which is firmly attached to the containers and storage tanks. All letters of said words shall be a minimum of four inches in height and one inch in width, and shall be printed in contrasting colors to the containers and storage tanks which are readily visible.

(c) All bulk storage areas shall be posted with a durable sign stating "PESTICIDE STORAGE," "AUTHORIZED PERSONNEL ONLY," "IN CASE OF EMERGENCY CALL \_\_\_\_\_"

(d) Pesticide applicators utilizing bulk storage containers shall be subject to the same requirements as set forth in this Rule.

*History Note:* Authority G.S. 143-441; 143-461; Eff. April 1, 2009.

For more information please contact the NCDA & CS – Pesticide Section, Compliance Monitoring & Field Operations at (919) 733-3556.

# New Record Keeping Requirements For Commercial Applicators And Public Operators Applying Restricted Use Pesticides

Effective April 1, 2009 the record keeping requirements for commercial applicators and public operators, has been updated to include the time each application was completed and each day of application recorded as a separate record. Regulation changes are notated in red in below:

## 02 NCAC 09L .1402 RECORD KEEPING REQUIREMENTS

All licensed pesticide applicators, as defined in G.S. 143-460 which includes public operators, utilizing ground equipment shall keep for three years and make available to the commissioner for like period records of all applications of restricted use pesticides showing the following:

- (1) name of licensed pesticide applicator or licensed public operator;
- (2) name and address of the person for whom the pesticide was applied;
- (3) identification of farm or site(s) treated with pesticide(s);
- (4) name of crop, commodity, or object(s) which was treated with pesticide(s);

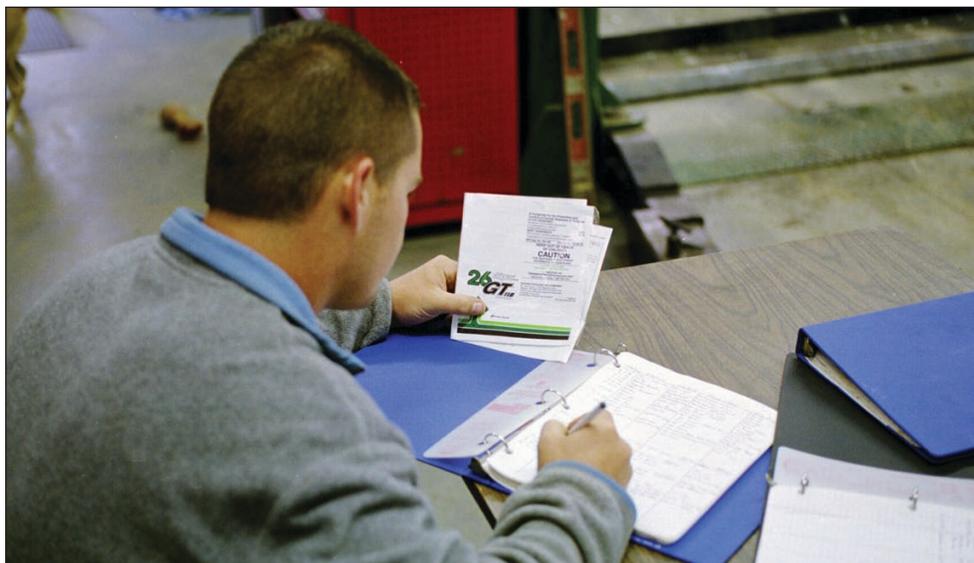


Photo: Tom Bowman

- (5) approximate number of acres or size or number of other object(s) treated;
- (6) the year, month, date and the specific time of day when each pesticide application was completed and each day of application shall be recorded as a separate record;
- (7) the brand name of the pesticide(s) and EPA registration number(s);
- (8) amount (volume or weight) of

pesticide formulation(s) or active ingredient(s) applied per unit of measure; and  
 (9) name(s) of person(s) applying pesticide(s).

History Note: Authority G.S. 143-458; 143-463; 143-466(a); Eff. October 21, 1977; Amended Eff. April 1, 2009.

For more information please contact the NCDA & CS – Pesticide Section, Compliance Monitoring & Field Operations at (919) 733-3556.

## Aerial Applicators, from page 4

### WORKER PROTECTION STANDARDS FOR AGRICULTURAL PESTICIDES, new regulation .1807 requires specific record keeping and display information for agricultural applications:

#### 02 NCAC 09L .1807 SPECIFIC INFORMATION ABOUT APPLICATIONS

(a) Concerning application information requirements contained in Sections 170.122 and 170.222 the following is also required to be completed by the agricultural employer:

- (1) In addition to the requirements of Sections 170.122(c)(3), and 170.222(c)(3), the specific time of day when each pesticide application was completed must be recorded immediately upon completion of the application. Each day of the application shall be recorded as a separate record.
- (2) After the application information referenced in 1807(a)(1) and the other information in Sections 170.122(c) and 170.222(c) has been displayed for the required period of time in Section

170.122(b) and 170.222(b), the agricultural employer shall maintain the information for a period of two years from the specific time of day when each pesticide application was completed. Such information shall be available for inspection and copying by the Board or its agents upon their request.

(b) In addition to information contained in Section 170.224(b), the handler employer must make the agricultural owner aware of the specific time of day when each pesticide application was completed. The agricultural employer shall display the information immediately and shall make it part of the record required to be maintained in paragraph (a)(1) and (2) of this part.

For more information please contact the NCDA & CS – Pesticide Section, Compliance Monitoring & Field Operations at (919) 733-3556.

# College team works to ensure farmworkers stay healthy when dealing with pesticides

Art Latham

NCSU College of Agriculture & Life Sciences Perspective Online

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A College of Agriculture and Life Sciences team is working to make crop fields safer for Spanish-speaking laborers through bilingual pesticide safety training.

Dr. Greg Cope, Julia Storm and Catherine LePrevost of the College's Environmental and Molecular Toxicology Department are developing "Pesticides and Farmworker Health: A Toolkit to Enhance Pesticide Safety Training for Hispanic/Latino Workers." The three-year project is funded by a \$223,785 NC Pesticide Board Pesticide Environmental Trust Fund grant.

Cope is associate professor, department Extension leader and N.C. State University agromedicine coordinator; Storm is an agromedicine information specialist, and LePrevost is a doctoral candidate and project coordinator.

LePrevost and Buhler discuss warning notices.

"The project is necessary and timely for several reasons," says Cope. "Pesticide products and their use in agricultural practice have changed since our original series was developed. The U.S. Environmental Protection Agency is evaluating changes to the Worker Protection Standard involving hazard communication, and relevant stakeholders have expressed the need for effective pesticide safety training resources for farmworkers to augment the crop sheets."

Says Storm, "We are developing innovative materials for crop-specific pesticide safety training for Latino farmworkers based on the latest research in hazard recognition and hazard communication as well as our own product development testing. The product we are developing is more visual and comprehensive than existing crop sheets in our state and others and addresses preferences expressed by farmworkers."

Based on the success of their 1998-2003 bilingual publication series, "Pesticides and Human Health" -- which covered tobacco, green peppers, cucumbers, Christmas trees, sweet potatoes, apples, tomatoes and grapes -- the team decided to enhance farm worker pesticide safety training by developing the toolkit.

- The toolkit includes: updated, improved, culturally appropriate, illustrated, low-literacy crop sheets and posters in Spanish and English that include information about toxicity signal words printed on pesticide labels, such as "caution," "warning" and "danger";
- information on restricted entry intervals, or the time period, based on a pesticide's toxicity, during which workers can't enter a pesticide-treated area;
- symptoms of acute health effects for pesticides most commonly used in many hand-labor-intensive crops in North Carolina;
- lesson plans for Extension and outreach educators, including a set of interactive activities from which trainers can choose to reinforce lesson learning objectives and assess most appropriate learning for a low-literacy audience with lower levels of formal education;
- a color flip chart with crop-specific images and scenarios for each crop that provides trainers with appropriate questions for engaging workers while displaying visual cues;
- references to more training resources.

"Because this is a low-literacy population and a Latino audience,



From left are Dr. Greg Cope, Environmental and Molecular Toxicology Department; Catherine LePrevost, project coordinator; and Dr. Wayne Buhler, Extension specialist, Horticultural Science Department. Cope and Buhler are listening to LePrevost's presentation of the bilingual pesticide safety training project.

traditional lecture methods such as PowerPoint presentations are less appropriate," says LePrevost.

"We are developing resources and educational tools based on basic and adult education principles and culturally appropriate design," she says. "For adults, lessons should validate learners' knowledge and experiences by providing opportunities to contribute these aspects to the training. So the lesson takes on a guided discussion format in which the trainer engages farmworkers in a conversation about pesticide safety."

Assisting the team are Cintia Aguilar, Cooperative Extension's Latino Affairs facilitator; Cesar Asuaje, bilingual farm safety educator, University of Florida Cooperative Extension, who also collaborated on farmworker focus groups; and N.C. Farmworker Health Program consultants from the state Health and Human Services Department. The team field tested toolkit prototypes with 25 farmworkers through focused small-group discussions to assess learning and preferences.

The team also consults with crop specialists for current use information for commonly used pesticides for each crop in the series. College consultants for the tobacco crop sheet in progress include Dr. Clyde Sorenson, entomology professor; Dr. Loren Fisher, associate professor and extension crop science specialist; and Dr. Asimina Mila, assistant professor and extension tobacco specialist.

The team will later include crops covered in their previous series -- tobacco, Christmas trees, sweet potatoes, green peppers, apples, cucumbers, tomatoes and grapes -- and several new ones: blueberries, landscape horticulture and strawberries.

"Some of these crops, like tomatoes, blueberries and strawberries, have a greater proportion of female workers," notes LePrevost. "To be sure the established prototype effectively communicates information to both men and women, we'll begin field testing the materials with a group of women working in tomatoes in 2009."



LePrevost and Buhler discuss warning notices.

# The Label Is The Law! (part 2)

[This is part 2 of the article discussing Signal Words on pesticide labels. Part 1 appeared in the Summer 2008 Pesticide update, which can be found at <http://www.ncagr.gov/SPCAP/pesticides/documents/Pesticideupdatesummer08.pdf>]

By Cam McDonald, Certification & Training Specialist, NCDA&CS

In the first part of this article, I explained how 5 acute toxicity studies are used for determining the toxicity of a pesticide product; the results of these studies are then used to assign the appropriate Signal word to the product. The acute (short-term exposure) toxicity studies include: Acute Oral (swallowing), Acute Dermal (contact with skin), Acute Inhalation (breathing), Primary Eye, and Primary Skin. The acute toxicity studies are directly related to the 4 main routes of pesticide exposure (oral, inhalation, ocular, and dermal). The Signal Word is determined by the most severe toxicity category assigned to the five acute studies or by the presence of methanol in concentrations of 4% or greater. The Signal Words and associated toxicity categories are as follows:

- Toxicity Category I..... DANGER**
  - Toxicity Category II..... WARNING**
  - Toxicity Category III..... CAUTION**
  - Toxicity Category IV.... None Required\***
- \*If a Signal Word is used, it must be "CAUTION."**

If methanol is present at concentrations of 4% or greater, regardless of the toxicity category results, the Signal Word must be "DANGER." In addition to the Signal Word "DANGER," pesticide products classified as Toxicity Category I for Acute Oral, Acute Dermal or Acute Inhalation Studies are also required to use the word "POISON" along with the skull and crossbones symbol .

Table 2 shows how the Toxicity Categories are used for assigning the appropriate Signal Word to a pesticide product. Product A (Table 2) must bear the Signal Word, CAUTION, due to the fact that the most severe Toxicity Category from the 5 studies is III (for Acute Oral, Acute Inhalation, and Primary Eye). Product B must bear the Signal Word, WARNING, since the most

**Table 2 - Examples of Signal Word Determination**

Type of Study	Product A	Product B	Product C*	Product D	Product E*
Acute Oral	III	IV	I	III	III
Acute Dermal	IV	III	III	IV	III
Acute	III	IV	III	III	III
Primary Eye	III	II	I	I	III
Primary Skin	IV	IV	II	IV	III
Special Inert, e.g., methanol	No	No	No	No	Yes*
CORRECT SIGNAL WORD	CAUTION	WARNING	DANGER (Poison with Skull & Crossbones) 	DANGER	DANGER (Poison with Skull & Crossbones) 

severe Toxicity Category is II (for Primary Eye). Products C, D, and E must all bear the Signal Word, DANGER. Product C must bear the Signal Word, DANGER, due to being Category I (for Acute Oral and Primary eye). Product D must bear DANGER due to being in Toxicity Category I (for Primary Eye). Product E must bear the Signal Word, DANGER, due to the presence of methanol in a concentration greater than 4% in the product.

In addition to the Signal word, DANGER, Products C and E must bear additional labeling. They must also bear the Skull & Crossbones symbol and the word, POISON (which must appear in red). Product C must bear the additional labeling as a result of being in Toxicity Category I for the Acute Oral Toxicity study. Product E must bear the additional labeling because it contains methanol at greater than 4% concentration.

A Signal Word is required for all registered pesticide products unless the pesticide product meets the criteria of Toxicity Category IV by all routes of exposure. If the manufacturer or registrant desires to use a Signal Word on a Toxicity Category IV product, they must use CAUTION as the Signal Word.

EPA requires that the Signal Word appear on the front panel of the label. Additionally, the EPA request that the Signal Word appear on a separate line from the required Child Hazard Warning statement, Keep Out of Reach of Children. The EPA also request that the Signal Word also appear in the Precautionary Statements section of a label immediately below the subheading "Hazards to Humans and Domestic Animals."

EPA also prefers that the Signal Word appear in all capital letters.

Signal Words are not randomly assigned. Many scientific studies are required to insure that the proper Signal Word is placed on a pesticide product. The studies are directly related to the main routes of pesticide exposure (oral, inhalation, ocular, and dermal) and provide important information regarding the toxicity (potential of a pesticide to cause adverse effects) of a pesticide product. The Signal Word on a pesticide product is there to help the applicator, and is an important indicator of the toxicity of the product. If you have the option of choosing between different pesticide products to complete a spray task, and the products have different Signal Words, the Signal Word is an excellent way to pick the least toxic product to apply.

# North Carolina Pesticide Board Actions

At the January 2009 through March 2009 meetings of the North Carolina Pesticide Board, the following settlement agreements, including license suspensions and monetary penalties totaling \$8,200.00 were approved for alleged violations of the NC Pesticide Law of 1971. Consent to the terms of the settlement agreement does not constitute an admission of guilt to any alleged violation.

**John F. Ireland**, Dunn, NC, for the alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and applying a pesticide(s) under such conditions that drift from pesticide(s) particles or vapors results in adverse effect. Mr. Ireland agreed to pay a monetary penalty of \$500.00.

**Samuel B. Church**, Fleetwood, NC for the alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and for alleged violations of the Worker Protection Standard. Mr. Church agreed to pay a monetary penalty of \$1,200.00.

**Wade Lamb**, New Bern, NC for the alleged violation(s) of providing or making available a restricted use pesticide to a non-certified applicator. Mr. Lamb agreed to pay a monetary penalty of \$900.00.

**James A. Sparks**, Columbia, NC for alleged violation(s) of disposing of pesticides or pesticide containers in such a manner as may cause injury to humans, vegetation, crops, livestock, wildlife, or to pollute any water supply or waterway. Mr. Sparks agreed to pay monetary penalties totaling \$1,600.00.

**Benjamin L. Lynch**, Mill Spring, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Lynch agreed to pay a monetary penalty of \$300.00.

**David V. Walton**, Lumber Bridge, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Walton agreed to pay a monetary penalty of \$400.00.

**Bobby H. Pipkin**, Blounts Creek, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and applying a restricted use pesticide without the proper license or certification. Mr. Pipkin agreed to pay a monetary penalty of \$500.00.

**Jonathan N. Berrier**, Brevard, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and applying a pesticide(s) under such conditions that drift from pesticide(s) particles or vapors results in adverse effect. Mr. Berrier agreed to pay a monetary penalty of \$700.00.

**Edward L. Williams, Jr.**, Williamston, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Williams agreed to pay a monetary penalty of \$500.00.

**Ronnie R. Bowes**, Roxboro, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and for alleged violations of the Worker Protection Standard. Mr. Bowes agreed to pay a monetary penalty of \$1,200.00.

**Conael W. Hughes**, Elizabeth City, NC for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and applying a restricted use pesticide without the proper license or certification. Ms. Hughes agreed to pay a monetary penalty of \$400.00.

## For More Information

### Pesticide schools and materials for certification and recertification:

CONTACT: Dr. Wayne Buhler, Dept. of Horticultural Science,  
Box 7609, NCSU, Raleigh, NC 27695.  
Phone (919) 515-3113

### Certification, licensing, and recertification credits or testing:

CONTACT: Pesticide Section, NCDA&CS,  
1090 Mail Service Center, Raleigh, NC 27699-1090.  
Phone (919) 733-3556

### Private applicator recertification classes:

CONTACT: Pesticide Section Homepage [www.ncagr.gov/SPCAP/pesticides/](http://www.ncagr.gov/SPCAP/pesticides/)

### Commercial applicator and dealer recertification classes:

CONTACT: Pesticide Section Homepage [www.ncagr.gov/SPCAP/pesticides/](http://www.ncagr.gov/SPCAP/pesticides/)

### Pesticide container recycling:

CONTACT: Henry Wade, Pesticide Section, NCDA&CS, 1090 Mail Service Center,  
Raleigh, NC 27699-1090.  
Phone (919) 733-3556

### Pesticide waste disposal:

CONTACT: Derrick Bell, Pesticide Section, NCDA&CS,  
1090 Mail Service Center, Raleigh, NC 27699-1090.  
Phone (919) 733-7366 or (919) 715-9023.

Send your suggestions for topics for future Pesticide Update articles to Cam McDonald at e-mail address: [cam.mcdonald@ncmail.net](mailto:cam.mcdonald@ncmail.net)

## Pesticide Section

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<http://www.ncagr.gov/SPCAP/pesticides/>

Pesticide Update is a biannual report of  
the Pesticide Section.



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