

Pesticide Update



Structural Pest Control and Pesticides Division, www.ncagr.com/pesticide/

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New Bystander Risk Mitigation Measures For Soil Fumigants

By Dr. Bob Bruss
*Risk Assessment and Environmental Fate
Team Manager, NCDA&CS*

The EPA released final Reregistration Eligibility Decisions (REDs) in 2009 for many soil fumigants that will have a significant impact on production practices for several key crops in North Carolina including tobacco, peanuts, strawberries, tomatoes and forestry seedlings. The new safety measures for soil fumigant pesticides are intended to increase exposure protection for agricultural workers and bystanders - people who live, work, or otherwise spend time near fields that are fumigated. The 2009 REDs apply to products than contain the following fumigant active ingredients:

- Chloropicrin
- Dazomet
- Metam sodium/potassium (including methyl isothiocyanate or MITC)
- Methyl bromide

Iodomethane is a fairly new soil fumigant that was first registered in 2007. Although iodomethane was not included in the recent REDs, the EPA provided the registrant with guidance on expected standards for bystander protection. Thus, iodomethane products already have labels with mitigation measures similar to the new requirements for the older compounds. Products that contain only 1,3-dichloropropene are not subject to implementation of the new RED requirements at this time. In 1998, 1,3-dichloropropene went through the reregistration process and it will be up for registration review in 2013.

The high pest control benefits of fumigants results in widespread use and potential scenarios for bystander exposure. As gases, fumigants move from the soil to the air at the application site and may pose risks to workers. Bystanders, who are not involved in the fumigant applica-

tion but who live, work, or are otherwise located in nearby areas, may also be exposed to airborne fumigants that move off the application site. Bystanders include agricultural workers in nearby fields who are not involved with the fumigant application. The incident rate of exposure to bystanders, although relatively rare in North Carolina, shows that fumigants have the potential to move off-site for periods of several hours to days after application at concentrations which could be detrimental to human health. These effects may range from mild and reversible eye irritation to more severe adverse health conditions, depending on the fumigant and level of exposure.

As a result, EPA is requiring a suite of complementary mitigation measures to protect handlers, reentry workers, and bystanders from risks resulting from exposure to the soil fumigants. These measures are designed to work together to address all risks, with special focus on the acute human inhalation risks that have been identified in the revised risk assessments for these fumigants. The risk mitigation measures include:

Buffer Zones – Areas around treated fields that prohibit entry for 48 hours after application unless individuals are wearing personal protective equipment (PPE) that meets clearly defined specifications. The size of the buffer zone depends on the size of the fumigated area, the application rate of the fumigant, the application method and the use of emission-control measures such as tarps. Detailed product labels will contain tables that list buffer zone distances based on these critical parameters. The buffer distance value obtained from the table may be reduced further based on credits for certain environmental parameters such as high clay content, high organic matter or low soil temperatures at application.

Difficult-to-Evacuate Sites (DES) – Soil fumigation will not be allowed within 1/8 to 1/4 mile of certain locations such as schools, state-licensed daycare centers, nursing homes, hospitals and prisons if the facilities are occupied during the application and the 36 hour period following the application. Fumigations that require a buffer zone of 300 ft. or less will only have a DES restriction of 1/8 mile, while fumigant application parameters that mandate a larger

*Please see Risk Mitigation,
page 7*

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Rule to Protect the Carolina Heelsplitter Freshwater Mussel in Union County

By Dr. Henry Wade, Environmental Programs Manager, NCDA&CS

The Carolina heelsplitter currently only exists in North Carolina in Union County. This mussel species was listed as an endangered species in 1993 and its critical habitats were designated in 2002 by the US Fish and Wildlife Service. The North Carolina Pesticide Board first considered adopting a rule to protect the mussel from specific pesticides in 2007. The Pesticide Advisory Committee of the Board and a subcommittee worked on developing a draft rule. A recommendation was made to the Board by the committee that ultimately led to the adoption of 2 NCAC 9L – Interim Protection Measures for the Carolina Heelsplitter Mussel, which became effective on March 1, 2010.

This rule is applicable to Duck, Goose, and Waxhaw creeks and joining streams. Farmers, commercial applicators, and anyone else who uses a pesticide outdoors containing an active ingredient listed in Table 1 are required to comply with this rule. The benefits of this rule are to protect the Carolina heelsplitter and to improve the water quality of the streams while allowing the continued use of these pesticides outside of the pesticide use limitation areas.

Pesticide Use Limitation Areas

Table 1 contains pesticide active ingredients that have specific limitations on pesticide use in order to protect the federally-listed endangered species Carolina heelsplitter (*Lasmigona decorata*) in Union County, NC, in the vicinity of:

- (1) the main stem of Goose Creek from the NC Highway 218 bridge, downstream to its confluence with the Rocky River;
- (2) the main stem of Duck Creek, from the Mecklenburg/Union County line, downstream to its confluence with Goose Creek; and
- (3) the main stem of Waxhaw Creek, from NC Highway 200 bridge, downstream to the North Carolina/South Carolina State line.

Pesticides with Additional Use Limitations

Effective March 1, 2010, the application of any of the following pesticides in the vicinity of the areas identified above must



The Carolina heelsplitter freshwater mussel

not occur within the areas identified by the codes in Table 1.

Code/Limitations:

1x - Within the pesticide use limitation areas previously described, and one-half mile up all streams that join the area, this pesticide shall not be applied within 20 yards from the edge of water for ground applications and within 100 yards for aerial applications;

2x - Within the pesticide use limitation areas previously described, and one-half mile up all streams that join the area, this pesticide shall not be applied within 40 yards from the edge of water for ground applications and within 200 yards for aerial applications;

3z - Within the pesticide use limitation areas previously described, this pesticide shall not be applied within 100 yards from the edge of water for ground applications and within one-fourth mile for aerial applications.

The new brochure for the Carolina heelsplitter in Union County has been completed. You can find it on our website by clicking on <http://www.ncagr.gov/SPCAP/pesticides/chs>; then click on "current brochure."

Table 1

Pesticide Active Ingredient & Code	
Azinphos-methyl 2x	Malathion 2x
Benomyl 1x	Methidathion 2x
Captan 1x	Methomyl 1x
Carbaryl 2x	Mevinphos 2x
Carbofuran 1x	Naled 1x
Chlorpyrifos 3z	Parathion (ethyl) 2x
Diazinon 2x	Pendimethalin 2x
Dicofol 2x	Permethrin 1x
Dimethoate 2x	Phorate 1x
Endosulfan 2x	Phosmet 1x
Esfenvalerate 1x	Phosphamidon 1x
Ethion 2x	Propiconazole 1x
Ethoprop 1x	Pyrethrins 2x
Fenamiphos 2x	Terbufos 2x
Fonophos 2x	Trichlorfon 2x

If you have any questions regarding this new regulation, please contact Dr. Henry Wade, environmental programs manager with the Structural Pest Control and Pesticides Division, at 919-733-3556.

New Regulations in Effect for Pesticide Containment Structures

By Mike Mitchell & Cam McDonald
NCD&CS

Last year the NC Pesticide Board adopted by reference new pesticide containment regulations; these regulations became effective on August 17, 2009. The purpose of the regulations is 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. The new regulations address both secondary containment for stationary containers, and containment pads for pesticide dispensing areas.

- **Do I have to comply with the new regulations?** You must comply with the new regulations if you are a refilling establishment, custom blender, or a commercial applicator and handle agricultural pesticides. Farmers will not be affected unless they fall into one of the above categories.
- **What else is covered by the new regulations?** The regulations mandate operational procedures for the owner or operator of affected facilities; and addresses requirements for inspection, maintenance, and recordkeeping.

This article is only a reminder that new containment rules are currently in effect. This article is not intended to be a compliance guide for the new regulations; the links that follow will provide additional information and specific details regarding who and



what is covered by the new pesticide containment regulations. For additional information, or for specific questions regarding the new rule, contact Mike Mitchell, NCD&CS at 919-733-3556 ext. 275 or visit the following EPA websites for additional information.

- http://www.epa.gov/pesticides/regulating/regulations_at_a_glance.htm (Note: this website 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>

Pesticide Disposal Assistance Program

- Statewide hosting of collection events
 - Special case onsite evaluation
- Household hazardous waste assistance



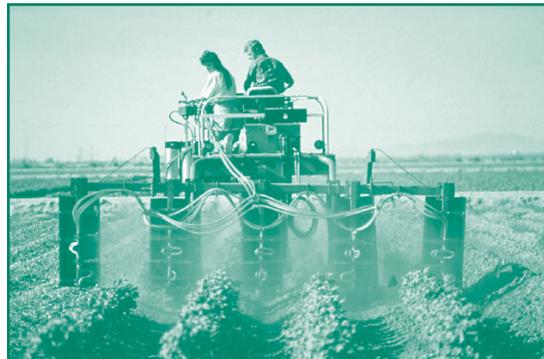
For a collection site near you go to:
www.ncagr.com/pdap

For pesticide disposal assistance call:

919-733-3556

North Carolina Department of Agriculture & Consumer Services

Steve Troxler, Commissioner



“Spray it Safe”

Remember: Always inform your employees before you spray ... It's the law!

Agricultural employers are required by the Worker Protection Standard to inform their employees of areas to be treated or where pesticides have been recently applied. “Workers must be notified of the application by warning them orally or by posting warning signs at the entrances to the treated areas.” Notification requirements are found on the pesticide label under “Agricultural Use Requirements.”

Potential Requirement for NPDES Permits for Pesticide Applications in, over, and near Waters of the United States

By Dr. Henry Wade, Environmental Programs Manager, NCDA&CS

On November 27, 2006 the Environmental Protection Agency (EPA) issued a final rule, Application of Pesticides to Waters in the United States in Compliance with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), clarifying two specific circumstances in which a Clean Water Act (CWA) permit is not required to apply pesticides to or around water. They are: 1) the application of pesticides directly to water to control pests; and 2) the application of pesticides to control pests that are present over or near water, where a portion of the pesticides will unavoidably be deposited to the water to target the pests.

The rule confirmed EPA's past operating approach that pesticides registered under FIFRA for application to or near aquatic environments are not subject to National Pollutant Discharge Elimination System (NPDES) permit requirements. The rule became effective on January 26, 2007.

Clarifying when the CWA applies to pesticide use is critical because confusion over when a permit is required could impact public health officials' efforts to prevent or respond to an infestation of mosquitoes that may carry the West Nile virus, or to control an invasive species that may damage valuable natural resources.

On January 19, 2007, EPA received petitions for review of the Application of Pesticides to Waters of the US in Compliance with FIFRA rule from both environmental and industry groups. The case, National Cotton Council and others versus EPA, was assigned to the US Sixth Circuit Court of Appeals to determine if it was a valid rule.

Since 2007, a decision was made by the Sixth Circuit that the final rule was not a reasonable interpretation of the CWA and thus not a valid rule. EPA was issued a stay on the November 27, 2006 rule until April 9, 2011, so CWA pesticide permits could be developed for all biological pesticide and chemical pesticide applications when such applications are made in or over, including near, waters of the US.

The following categories are covered by

Categories covered by the Court's decision when pesticides are applied in, over, or near waters of the US:

- Mosquito and other aquatic nuisance insect control
- Aquatic weed and algae control
- Area-wide and ditch bank pest control
- Aquatic nuisance animal control

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Agricultural irrigation return flows and agricultural runoff will not require NPDES permits as they are specifically exempted from the CWA. Currently, pesticide drift is not a part of the Court's decision.

In November 2009, CropLife America, American Farm Bureau Federation, and others petitioned the US Supreme Court to review the decision by the US Sixth Circuit Court of Appeals. On February 22, 2010, the US Supreme Court announced it would not review the case.

EPA plans, before the ruling takes effect (April 9, 2011), to issue a final general NPDES permit for covered pesticide applications, to assist authorized states to develop their NPDES permits, and to provide outreach and education to the regulated community. EPA will work closely with state water permitting programs, the regulated community and environmental organizations in developing a general permit that is protective of the environment and public health.

EPA has been working with its Office of Water Regional staffs to develop a proto-

type for a Pesticide General Permit for use in four states, as well as territories, tribal lands, and certain federal lands that do not have NPDES permitting authority. Each of the remaining 46 states (includes NC) will be working with their EPA Regional offices to develop a Pesticide General Permit that meets EPA's approval. A NC Pesticide General Permit must be as restrictive as the one EPA is now developing.

Once entities responsible for pesticide applications in aquatic sites have been approved to operate under a NC Department of Environment and Natural Resources' Pesticide General Permit, some entities will be required to perform some activities that are currently under consideration, such as integrated pest management, equipment maintenance, adverse incident reporting, annual reports, and recordkeeping.

EPA plans to issue a public notice in the Federal Register of the draft Pesticide General Permit in May 2010. The public comment period for this notice will be in June. If you have comments that you would like for EPA to consider, this would be the best time for you to offer recommendations on this issue because it will establish minimum requirements for a NC Pesticide General Permit. A permit for use in NC will be developed before April 2011.

More information will be forthcoming on this issue in future editions of this newsletter.

Pesticide Disposal Assistance Program Helps North Carolina Citizens with Pesticide Waste Problems

By Ken Crabtree and Jeremy Maciejewski, Pesticide Disposal Specialists, NCDA&CS

The routine work of the Pesticide Disposal Assistance Program (PDAP) consists of 1-day agricultural waste collections arranged by county extension offices, assisting with special 1-day Household Hazardous Waste (HHW) programs or pickups from permanent HHW collection centers. The PDAP is a service of the North Carolina Department of Agriculture and Consumer Services that is the oldest program of its kind in the U.S. (since 1980) and annually collects over 135,000 pounds of waste pesticides.

However, the PDAP team occasionally encounters a situation that transcends the expectations and conditions of an organized collection program. A farmer passes away and many years later his family decides to clean out that old shed containing unused farm supplies. After inspecting the piles of damaged pesticide containers, the family realizes they need help and a call is placed to PDAP. The team consisting of Derrick Bell, Ken Crabtree and Jeremy Maciejewski responded not once but twice to similar requests for special assistance in 2009.

On April 16th, 2009, Mr. David Morrison of the Scotland County Cooperative Extension Service was contacted by a farmer's widow with pesticides on her property. Mr. Morrison asked PDAP to assist him in finding a solution to the problem. The PDAP promptly scheduled a pick-up time in conjunction with a previously scheduled biennial Collection Day in Scotland County set for April 20th.

The PDAP arrived early on the April 19th to inspect the site, take photos and begin removal of some of the material. (Photo 1)

Some of the pesticide materials and hazards located in the building consisted of a 5ft black snake, pendimethalin, gramoxone, carbofuran, atrazine, and a 25 lb methyl bromide cylinder typically used for fumigation. (Photo 2)

Mr. Morrison assisted the PDAP in bagging and shoveling the material at the site. (Photo 3)

On April 20th, Mr. Morrison and the PDAP returned to the farm site to complete the cleanup. The collected material was then given to the Hazardous Material contractor present at the scheduled Scotland County Collection Day.

The PDAP later notified Mr. Morrison that approximately 1,500 lbs of pesticides were removed from the property. Mr. Morrison acknowledged PDAP's "invaluable service and proactive program" in a memo to Commissioner Steve Troxler of NCDA&CS.

On August 17th, 2009, the NCDA&CS Structural Pest Control and Pesticides Division Pesticide Disposal Assistance Program (PDAP) received another phone call requesting assistance with the disposal of some pesticides located at a farm site in Harnett County. The resident (another wife of a deceased farmer) informed the PDAP that her family had grown tobacco, cotton, and other farm commodities on the property in the past.

On August 27th, Ken Crabtree of the PDAP inspected the farm site to prepare for the disposal event. The material was located in a dilapidated barn and surrounded by old hay bales. (Photo 4)

Please see Disposal, page 6



Photo 1



Photo 2



Photo 3

Pesticide Disposal, from page 5

Upon first inspection it was thought to be 800-900 lbs. of 1.4% maneb, a fungicide with a low hazard. (Photo 5)

Mr. Crabtree informed the resident when the PDAP would be able to assist her in the removal of the pesticides from the property.

On October 29th, 2009, the PDAP took photos and began work bagging the disintegrated maneb bags only to find that the bags underneath were mixed with DDT, parathion, endrin, toxaphene, methoxychlor, and malathion dust. (Photo 6)

PDAP personnel promptly donned their negative pressure respirators to avoid inhalation of the pesticides. (Photo 7)

After completion, it was determined that approximately 2,800 lbs. of pesticides were collected. (Photo 8)

The resident was happy to see that the PDAP was able to assist her in the disposal of the pesticides that had been in the barn for many years. (Photos 9 & 10)

The PDAP provides residents an outlet to dispose of pesticides through its proactive innovative program.

It is the combined efforts of the PDAP, Cooperative Extension, and property owners that make it possible to help keep the environment safe for all.

The PDAP continues to serve and help the residents of North Carolina find solutions to their pesticide disposal needs.



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10

Temik on Tobacco Phase-Out

By Lee Davis

Pesticide Registration Manager, NCDA&CS

A long-time workhorse for North Carolina tobacco growers is being phased out. Once existing stocks of Temik Brand 15G are exhausted, its use on tobacco will no longer be legal. This phase out is one result of an extensive review of aldicarb (the active ingredient in Temik) by the Environmental Protection Agency (EPA). Based on information evaluated during this review, the EPA has concluded that the current labeled uses of aldicarb pose unacceptable risks to human health, wildlife, and the environment in general. To help bring these risks down to what the EPA considers acceptable, tobacco use is being eliminated. Applications to several other crops such as coffee, ornamentals, pecans, sugarcane, sorghum, and alfalfa grown for seed are also being cancelled. Uses on many other crops are also being altered in order to help reduce exposure risks even more.

On September 23, 2009 the EPA cancelled the following Special Local Need registrations that allow the use of Temik Brand 15G (EPA Reg.# 264-330) on tobacco.

NC-780021 (flea beetle control)

NC-820008 (aphid control)

According to the EPA cancellation order, "existing stocks already in the hands of dealers or users can be distributed, sold, or used legally until they are exhausted, provided that such further sale and use comply with the EPA-approved label and labeling of the affected product." Therefore, existing stocks of this product already in the hands of dealers or growers in North Carolina can continue to be sold and used under the conditions of these Special Local Need registrations until exhausted. For the purposes of this cancellation order, product with a date prior to September 8, 2009 printed on the label is considered "existing stocks" and can be sold and used for the Special Local Need purposes. Product labeled with a date on or after September 8, 2009 is considered newly produced stock and can not be use.

It is important to remember that a copy of the Special Local Need labeling must be in the possession of the user at the time of application. All instructions on the labeling must be followed. If you would like to read more about the EPA's decision regarding future uses of aldicarb, go to http://www.epa.gov/pesticides/reregistration/REDs/aldicarb_red.pdf. For questions regarding the phase out on tobacco contact Lee Davis, NCDA&CS at (919)733-3556 ext. 301.

Risk Mitigation, from page 1

buffer will require a ¼ mile DES restriction.

Posting Requirements – In order to take appropriate action, individuals need to be aware when approaching the boundary of a buffer zone for a fumigated area. The soil fumigant REDs have very specific requirements for information that must be included on buffer zone signs. Posting will be required at all usual points of entry or approach routes to the buffer zone unless a physical barrier (such as a fence) blocks access to the buffer or the owner/operator controls all of the area within 300 ft. of the buffer.

Agricultural Worker Protections – ‘Handlers’ are workers assisting with any field aspect of the fumigant process such as application, monitoring air concentrations, or tarp management activities. The REDs include new requirements for PPE (especially respirators), restricted entry intervals and tarp perforation/removal procedures to prevent handler exposure.

Applicator and Handler Training Programs – The REDs for the soil fumigants (786 pages) and even product labels (projected at over 30 pages for each product) are imposing documents that would require considerable review for an unaided applicator to determine the information that is relevant to their situation. As such, the EPA is requiring extensive formal training for anyone supervising a fumigant application as well as additional training that is focused on the special needs of handlers. Registrants of fumigant products are responsible for the development and the conduct of the comprehensive training programs for supervisors/applicators which is required once every three years. While the registrant is responsible for developing the handler protection program, it is the responsibility of the supervisors/applicators to make sure their workers have received this training within 12 months preceding the participation in field fumigation activities.

Good Agricultural Practices – Fumigant labels already contain many non-binding suggestions for agronomic practices. These recommendations promote soil retention of the applied fumigant for optimum pest control which coincidentally corresponds with minimizing atmospheric dissipation and the likelihood of bystander exposure. The REDs extend this concept by making certain good agricultural practices mandatory. In addition, this will promote

consistency in use directions for all fumigant products.

Application Method, Practice and Rate Restrictions – The EPA is imposing limitations on certain fumigant materials to minimize the amount of gas escaping from the soil to the atmosphere. The maximum use rate for some crops will be reduced for many fumigant products. However, the new rate structure still contains the amount typically used for most North Carolina field applications. All field applications of methyl bromide products in North Carolina will require the use of tarps.

Restricted-use Pesticide Classification - Metam sodium/potassium and dazomet will become restricted-use pesticides. All other soil fumigants used in North Carolina already have a restricted-use classification.

Emergency Preparedness and Response Requirements – Despite best intentions, certain application scenarios combined with unexpected weather conditions may lead to off-target movement of fumigant gases. The REDs contain expectations for mandatory measures to promote early detection and appropriate response to vapors drifting outside of the managed area. Applicators will have the option to monitor the perimeter of the buffer zone for escaping volatiles or promote neighbor awareness through the pre-application notification of essential information. A written emergency response plan is required that would be triggered if fumes are detected by neighbors or the monitoring program. Registrants are expected to develop and provide training materials to first responder agencies in high fumigant use areas.

Notice to State and Tribal Lead Agencies – EPA has encouraged state lead agencies to consider adopting a mandatory pre-notification system for impending fumigations. The NCDA&CS does not plan to require pre-notification of fumigant applications unless it becomes apparent that such a system is needed to promote compliance with requirements of the REDs.

Site Specific Fumigant Management Plan – Written site specific fumigant management plans (FMP) will be mandatory to organize the multitude of details associated with the soil fumigation process and promote consistency for compliance reviews. The FMP will be a comprehensive listing of

information on the fumigation site, the applicator, handlers, training programs, application procedures, emergency response plan and buffer zone details. Information on over 20 Good Agricultural Practice items will be required to be documented in the FMP. Registrants, public institutions and regulatory agencies are developing FMP templates and checklists to help with the implementation of RED requirements.

Implementation of the REDs for soil fumigants is planned to be phased in over the 2010 and 2011 seasons according to the following schedule:

2010 Mitigation Targets

- Handler respiratory protection
- Tarp perforation and removal restrictions
- Reentry restrictions
- Good Agricultural Practices (GAPs)
- Fumigant Management Plans (FMPs)
- RUP classification
- Registrant-provided handler information
-

2011 Mitigation Targets

- Buffers and buffer posting
- Restrictions near difficult to evacuate sites
- Emergency preparedness and response
- Registrant-provided training and community outreach programs
-

What is actually accomplished in 2010 will be based on when revised labels make it to the marketplace. Products with new labels may not be available this season and the targeted implementation schedule may be delayed for as much as a year. An applicator is only expected to follow the directions on the products that are being applied.

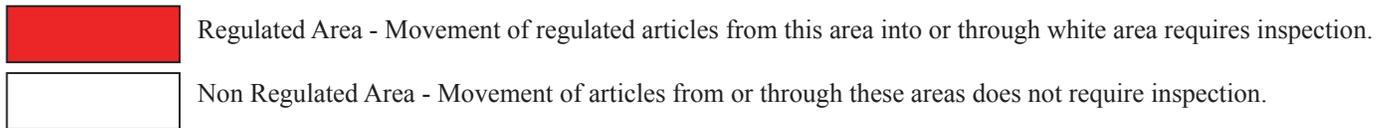
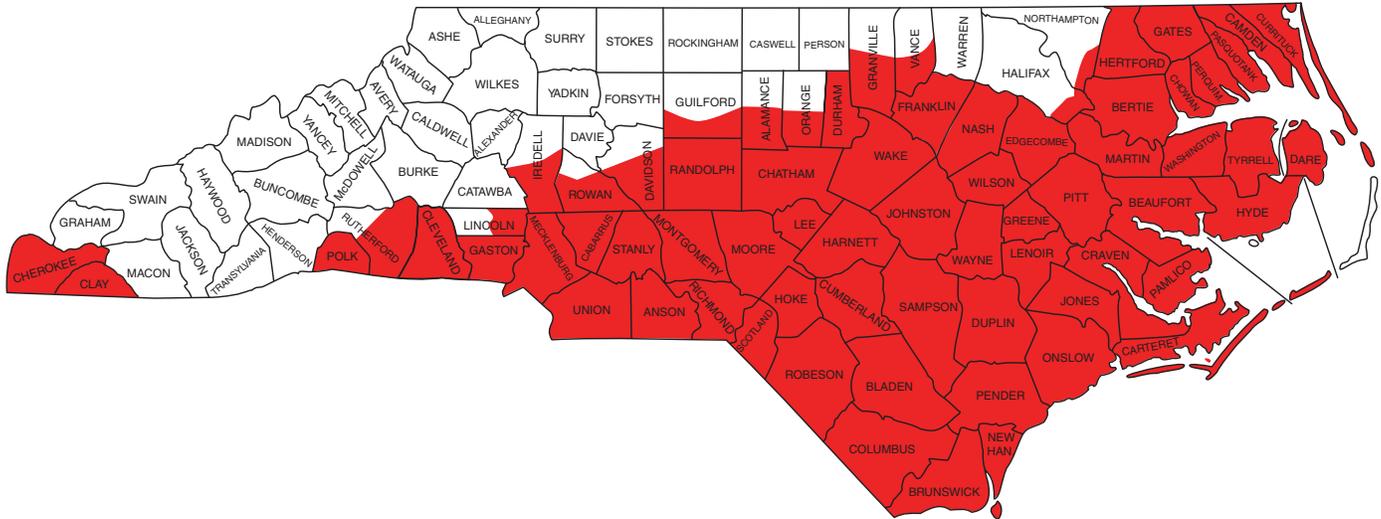
Additional background on the REDs for soil fumigants can be found at the website listed below. The site contains additional links to more detailed information on many of the sections in this article. The EPA plans to make FMP templates available at this same web location.

http://www.epa.gov/pesticides/reregistration/soil_fumigants

Imported Fire Ant Quarantine Area

North Carolina - 2010

<http://www.ncagr.gov/plant/entomol/ifamap.htm>



1/2010

Quarantine area for the imported fire ant expanded

RALEIGH -- The N.C. Department of Agriculture and Consumer Services is expanding a state quarantine for the imported fire ant in a continuing effort to monitor and address this pest. With the expansion, the quarantine now includes portions or entire areas of 70 counties.

The quarantine expansion means residents and business owners in all of Currituck, Durham and Hertford counties, and portions of Alamance, Granville, Guilford, Iredell, Rutherford and Vance counties will now need to obtain a permit before moving plants, sod and related equipment into or through non-infested areas. Effective immediately, the imported fire ant quarantine is revised to include the addition of:

- * Currituck County - The entire county.
- * Durham County - The entire county.
- * Hertford County - The entire county.
- * Alamance County - The area south of Interstate 85 from the Guilford County line

to the Orange County line.

- * Granville County - The area south of U.S. 158 from the Person County line to the Vance County line.

- * Guilford County - The area south of I-40 from the Alamance County line to the Forsyth County line.

- * Iredell County - The area south of I-40 from the Davie County line to the Catawba County line.

- * Rutherford County - The area south and east of N.C. 108 from the Polk County line to the junction of U.S. 64 E. to the McDowell County line.

- * Vance County - The area south of I-85 from the Warren County line to the Granville County line.

Items requiring a permit include sod, soil, hay and straw, nursery plant material, logs or pulpwood with soil, and soil-moving equipment. Movement of infested materials could result in the establishment and

secondary spread of the pest to non-infested areas. Businesses and individuals within the quarantined areas will need to obtain a permit to move these materials through or to non-quarantined areas. Certificates can be obtained from a local plant protection specialist or by contacting the Plant Protection Section at (800) 206-9333 or (919) 733-6932.

“Failure to obtain the needed inspections and certifications may result in the issuance of a stop-sale notice and rejection or destruction of the regulated article,” said Gene Cross, director of the NCDA&CS Plant Industry Division. “Fire ants can be harmful to humans and livestock. It is critical we continue proactive efforts to slow down fire ant movement into non-infested areas of the state.”

For a map of the quarantine area, go to <http://www.ncagr.com/plantindustry/plant/entomology/documents/FireAntMap2010.pdf>.

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.

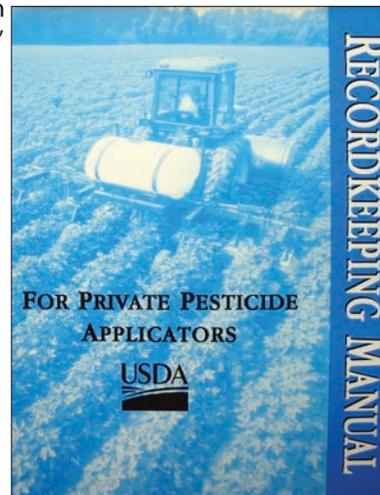
(b) In addition to information contained in Section 170.224(b), the handler employer must make the agricultural owner aware of the specific time of day when each pesticide application was completed. The agricultural employer shall display the information immediately and shall make it part of the record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



For an example showing how to comply with the new regulations, and a sample record keeping form, see page 10.

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);
- (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.

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).

Developed by Wayne G. Buhler, Ph.D., NC State University, in collaboration with the Structural Pest Control and Pesticides Division, NCDA&CS.

AG-689W

E08-50268

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 noted 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.

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 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.

Please see Aerial Applicators, page 13

Aerial Applicators, from page 12

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

Pesticide Board from page 14

pesticide(s) particles or vapors results in adverse effect. Mr. Barringer agreed to pay a monetary penalty of \$300.00.

Roger G. Liles, Littleton, 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. Liles agreed to pay a monetary penalty of \$300.00.

Shane M. Revelle, Murfreesboro, NC, for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Revelle agreed to pay a monetary penalty of \$350.00.

Ryan E. Cooper, Elizabeth City, NC, for alleged violation(s) of applying a pesticide without a license. Mr. Cooper agreed to pay a monetary penalty of \$600.00.

Ronald D. Morse, Jr., Cove City, NC, for alleged violation(s) of applying a pesticide without a license. Mr. Morse agreed to pay a monetary penalty of \$600.00.

Jack L. Reynolds, Charlotte, NC, for alleged violation(s) of applying a pesticide without a license. Mr. Reynolds agreed to pay a monetary penalty of \$400.00.

Voluntary Purchasing Groups, Inc., Bonham, TX, for alleged violation(s) of distributing, selling or offering for sale a pesticide which is adulterated. Voluntary Purchasing Groups, Inc. agreed to pay a monetary penalty of \$600.00.

William J. Brinkley, Dover, 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. Brinkley agreed to pay a monetary penalty of \$700.00.

Roger D. Molt, Plymouth, 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. Molt agreed to pay a monetary penalty of \$800.00.

Arnold D. Smith, Roseboro, 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. Smith agreed to pay a monetary penalty of \$800.00.

Steven M. Mastrangelo, Forest City, NC, for alleged violation(s) of applying a pesticide without a license. Mr. Mastrangelo agreed to pay a monetary penalty of \$400.00.

William G. Hipp, Fuquay-Varina, 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. Hipp agreed to pay a monetary penalty of \$750.00.

Michael W. Ferrell, Jr., Stem, NC, for alleged violation(s) of applying a pesticide without a license. Mr. Ferrell agreed to pay a monetary penalty of \$400.00.

Ben H. Graning, Sylva, NC, for alleged violation(s) of using a pesticide in a man-

ner inconsistent with its labeling and applying a pesticide without a license. Mr. Graning agreed to pay a monetary penalty of 1,000.00.

Pesticide Section

North Carolina Department of
Agriculture & Consumer Services
Structural Pest Control and
Pesticides Division
James W Burnette Jr., Director

1090 Mail Service Center
Raleigh, NC 27699-1090
(919) 733-3556
FAX (919) 733-9796

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

Pesticide Update is a biannual report of the Pesticide Section.



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North Carolina Pesticide Board Actions

At the May 2009 through November 2009 meetings of the North Carolina Pesticide Board, the following settlement agreements, including license suspension and monetary penalties totaling \$20,000 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.

Ronald L. McDonald, St. Pauls, 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. McDonald agreed to pay a monetary penalty of \$200.00.

Terry L. Saunders, Inman, SC, for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Saunders agreed to pay a monetary penalty of \$600.00.

Roderick V. Leary, Edenton, NC, for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling and for alleged violation(s) of the Worker Protection Standard. Mr. Leary agreed to pay a monetary penalty of \$800.00.

Donald L. Parks, Elizabeth City, NC, for alleged violation(s) of providing or making available a restricted use pesticide to a non-certified applicator. Mr. Parks agreed to pay a monetary penalty of \$1,700.00.

Brian D. Hopkins, Columbia, NC, for alleged violation(s) of providing or making available a restricted use pesticide to a non-certified applicator. Mr. Hopkins agreed to pay a monetary penalty of \$1,200.00.

Roy H. James, Columbia, 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. James agreed to pay a monetary penalty of \$300.00.

Martha Calderon, Morganton, 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. Ms. Calderon agreed to pay a monetary penalty of \$1,200.00.

Alton R. Hamill, Enfield, NC, for alleged violation(s) of providing

or making available a restricted use pesticide to a non-certified applicator. Mr. Hamill agreed to pay a monetary penalty of \$1,200.00.

David A. Sherrill, Ellerbe, NC, for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Sherrill agreed to pay a monetary penalty of \$600.00.

S. Stuart Pierce, Jr., Ahoskie, NC, for alleged violation(s) of providing or making available a restricted use pesticide to a non-certified applicator. Mr. Pierce agreed to pay a monetary penalty of \$800.00.

Wepak Corporation, Charlotte, NC, for alleged violation(s) of distributing, selling or offering for sale a pesticide which is misbranded. Wepak Corporation agreed to pay a monetary penalty of \$600.00.

William C. Thompson, III, Kings Mountain, NC, for alleged violation(s) of applying a pesticide without a license. Mr. Thompson agreed to pay a monetary penalty of \$300.00.

Jon L. Oatman, Tilly, AR, for alleged violation(s) of using a pesticide in a manner inconsistent with its labeling. Mr. Oatman agreed to pay a monetary penalty of \$600.00.

William Ward, III, Ahoskie, 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. Ward agreed to pay a monetary penalty of \$300.00.

Wepak Corporation, Charlotte, NC, for alleged violation(s) of distributing, selling or offering for sale a pesticide which is adulterated. Wepak Corporation agreed to pay a monetary penalty of \$1,000.00.

Floors and Courts, Inc., Kinston, NC, for alleged violation(s) of distributing, selling or offering for sale a pesticide which is adulterated. Floors and Courts, Inc. agreed to pay a monetary penalty of \$600.00.

George L. Barringer, Salisbury, 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

Please see Pesticide Board, page 13

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/SP-CAP/pesticides/

Commercial applicator and dealer recertification classes:

CONTACT: Pesticide Section Homepage www.ncagr.gov/SP-CAP/pesticides/

Pesticide container recycling:

CONTACT: Dr. 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) 733-3556.

Send your suggestions for topics for future Pesticide Update articles to Cam McDonald at e-mail address: cam.mcdonald@ncagr.gov