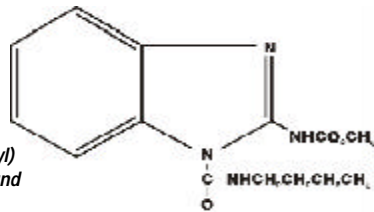




# Obituary for the fungicide Benlate

(1957 – 2002)

Pesticides come and go without much fanfare, but the announcement by DuPont this spring that it would phase out the manufacture of Benlate fungicide came as quite a surprise. (See DuPont's newsrelease on the Benlate phase out.) In its hey day, Benlate was registered in over 100 countries on hundreds of crops to control hundreds of disease-causing fungi. It was a breakthrough pesticide which for the first time could actually cure an infected plant. In its day, it was to fungicides what Roundup is to herbicides. It was huge. So, I thought a proper recitation of Benlate's legacy should be undertaken in this obituary.



My introduction to Benlate was in my undergraduate plant pathology class — Plant Path 311. It was the spring term of 1980. The professor was articulating the differences between protectant fungicides and systemic fungicides. Benlate, or the generic compound benomyl, was being touted as a new generation fungicide with almost magical systemic properties. Suffice to say, I did well in the class, but cared little about the practical implications of Benlate's properties.

In 1982 I stepped up to the plate and signed on for a graduate program in plant pathology. Soon I was scouring the literature researching various fungicidal compounds. One of them, Benlate, was constantly being reported as having unique systemic properties. Before long I was evaluating its efficacy in both the laboratory and the field. Thanks in part to successes obtained from using Benlate, my research was found useful enough to produce a thesis and graduation soon followed.

In the 1980s and early '90s I worked in Eastern Washington and saw that Benlate was being used to successfully counter a serious disease of winter wheat called foot rot. In the course of my business, I traveled often to Canada and saw how it controlled white mold in canola. This eventually led to canola becoming their number one cash

crop. In North Dakota, it first solved problems for sugar beet growers and then helped farmers get a handle on white mold in dry beans. When the epidemics of scab attacked North Dakota's wheat crop in the early 1990s, it was found to be the only practical solution for suppressing the disease until 1997. About this same time, it was the only registered seed treatment on canola for the control of virulent black leg. It was finally replaced with the introduction of Helix this past year. At the time of this writing, it is only one of two acceptable pesticides available for the control of white mold in dry beans.

So, this fine pesticide is now being phased out, the question is why? Is EPA classifying it as a dangerous chemical? No.

Are other fungicides proving more economical? Yes, but in some situations, it is still the product of choice. Indeed, until this spring a registration was still being sought by North Dakota canola growers for the control of white mold disease.

If EPA isn't targeting it, and it is still useful, then why is it being phased out? The answer is: that it is being litigated to death. In the history of pesticides, no other compound has faced more litigation and damage claims against it than Benlate. See the notable dates that follow.

## In this issue . . .

Obituary for the fungicide Benlate	1
Coordinator's Comments	2
DuPont to Phase-out Sale of Benlate	3
Not All Labels are the Same	3
Certification Now Required for Commercial Applications of General Use Pesticides	4
Request Training Materials and More On-line With Our Secure Web Server	4
Financial Responsibility Requirement Maintained—Streamlined	5
Financial Responsibility Law	5
N.D. Financial Responsibility Waiver	6
Nine Year Testing Rule to be Abolished	7
Old Pesticides — Okay to Use?	7

## Coordinator's Comments

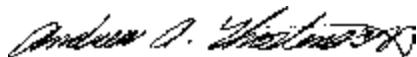
In the summer months calls here in the pesticide program office slow down to just a trickle so we try to use the time to get caught up and prepare for another training season. If you look at this issue of the Pesticide Quarterly you will note that we have much to get prepared for!

We're game for the challenge. We've already set our training schedule for 2001-2002 so have a look at our website and do some advance planning.

We are moving ahead aggressively to use the Web to become more efficient. (See the article on our on-line ordering system.) Behind the scenes we are working out the practical problems with rolling out a limited on-line testing system in 2002. There are plenty of questions that still need to be answered, but we are making good progress. Finally, we are developing an interactive computer-based training program for the fumigation category. If all goes as planned, some of you may use this to complete your training requirements in 2002.

In June we moved Arla Rudy-Malmedal to a full time staff position. She has been working for us for the past couple of years on a part time basis. She will be working on processing certifications and spearheading the financial responsibility program as before, but will spend more time developing training materials — especially computer-based ones. We're happy to have her.

May your summer be profitable and enjoyable one,



Andrew A. Thostenson  
Pesticide Program Specialist

Obituary for the fungicide Benlate

*continued from page 1*

### Notable dates in Benlate's stormy history

- **1957** – Hein Klopping, DuPont Scientist, synthesizes the compound and begins field evaluations.
- **1968** – DuPont announces impending registration of a new systemic fungicide with curative properties. The fungicide can penetrate a plant's cells and protect it from the inside, rather than just sitting on the leaf and shielding it from the outside.
- **1969** – Dupont begins marketing Benlate worldwide. Approval in the US is still pending.
- **1970** – Benlate enters the U.S. market.
- **1973** – Plant pathologists describe Benlate as the most far reaching fungicide since the introduction of Boudreaux Mix (the first fungicide used in agriculture — discovered in France during the last half of the 19th century).
- **1979** – Benlate becomes DuPont's number one best selling pesticide. Sales exceed \$100 million annually.
- **1980** – Benlate resistant strains of fungi begin to limit the fungicide's effectiveness. Sales begin to slip. DuPont Scientist Charles Delp publishes seminal white paper on fungicide resistance and proposes methods to control it.
- **Mid 1980s** – Thanks to innovative resistance management strategies, Benlate sales hold steady.
- **1987** – DuPont introduces a new Benlate formula called Benlate DF. The new DF version disperses in water more easily than the older products and therefore results in better application properties.
- **1989** – Dupont discovers herbicide contamination in the Benlate DF manufacturing process.
- **1991** – Benlate DF permanently recalled, other formulations continue to be marketed.
- **1992** – Crop damages from herbicide contamination result in over \$500 million being paid out to users of Benlate DF. DuPont takes a hard line against future claims. Litigation ensues.
- **1993** – First court case held on Benlate DF damages. Eventual payouts reach \$20 million.
- **1994** – DuPont settles over 200 court cases with over \$214 million in payouts made. Another herbicide contamination incident is claimed in a new court case filed in Hawaii.
- **1995 to 1998** – Perjury and obstruction of justice charges are launched against DuPont in Georgia, Hawaii, and Florida. An eventual \$10 million settlement is reached.
- **1996** – Woman claims birth defects from Benlate exposure. Class action cases filed across North America.
- **1999** – DuPont shareholders file fraud charges in Florida court claiming the company grossly understated the liability risk associated with Benlate litigation. Fraud charges also filed by Hawaiian growers who were unsatisfied with the 1998 settlement.
- **2000** – Dupont suffers a \$69 million judgment against it by pecan growers in Texas and later settles for an undisclosed lesser amount.
- **February 2001** – Appeals arguments are held in the Florida Supreme Court regarding the birth defect claims.
- **March 2001** – Fraud cases in Florida are still pending but settlement seems eminent.
- **April 19, 2001** – DuPont announces the world wide phase out of Benlate fungicide despite annual sales figures of \$90 million.

- **July 2001** – Litigation continues. *To date, DuPont claims over \$1 billion has been paid out or spent on litigation related to Benlate fungicide.*
- **December 31, 2001** – All corporate sales of Benlate to cease.
- **2002** – Benlate to clear all channels of commerce by year's end. EPA to revoke all Benlate tolerances at DuPont's request.

### The blame game

The death of Benlate is certainly premature. Litigation was the cause, but the underlying reasons for the litigation can be attributed to any number of human frailties: errors in judgment, greed, hysteria, as well as revenge.

No doubt DuPont at times felt the victim because whenever someone's crop hiccupped, it was writing checks or arguing in court. On the other hand, some growers were legitimately damaged and were only seeking satisfaction. Finally, still others were grasping at explanations for children born without eyes

The players who are to blame for this are legion. But the results are the same. Many people were injured directly or indirectly and a fine product is no longer available.

### The legacy of Benlate

Interestingly, when confronted with the problem of product growing pains — fungicide resistance — DuPont was at its best. In the late 1970s it used sound science to characterize the issue and find solutions. In the short run, Benlate's life was issued anew (another 20 years). In the long run, the appreciation of the causes and the management of fungicide resistance are classical studies in the science of plant pathology. Today these lessons are being used over and over again

*continued at right*

## DuPont to Phase-out Sale of Benlate

*The following is a news release from DuPont*

WILMINGTON, Del, April 19, 2001 — Today DuPont informed its customers around the world that it will discontinue the manufacture of its fungicide benomyl and will phase out sales of Benlate in all its forms from the global market. No sales will occur after December 31, 2001, and we expect all product will clear the channels of trade by the end of 2002.

DuPont advised customers that this is not a product recall, but a voluntary business decision based on a review of global market conditions and other factors. The decision is part of the recently announced restructuring to improve the overall competitiveness of its agricultural businesses.

A significant element of the reason to withdraw is that the company is no longer willing to bear the high and continuing costs of defending the product in the U.S. legal system where factors other than good science can influence outcomes. In addition, there are significant ongoing costs and resources necessary to meet increased regulatory requirements around the world and keep the product active. The company believes those resources are better applied to other areas of the business.

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in preventing the next generation of fungicides from becoming short-lived flashes in the pan.

The passing of Benlate is indeed a sad affair. A valuable tool is gone. However, the compound that Hein Kloppe discovered 44 years ago and which eventually helped nourish millions will not quickly be forgotten. It's memory will live in university classrooms, in industry board rooms, in regulatory committee rooms, and it will be taught year in and year out to applicators as an essential component of pesticide certification programs.

DuPont remains fully confident that Benlate is safe when used as directed. The 30-year-old fungicide has been an excellent crop protection option for growers worldwide.

### Not All Labels are the Same

"I used Roundup." or at least that is what your pesticide records show. But, do you know which one of the many products that have "Roundup" in the name you actually used? In today's world of ever increasing company mergers and new product markets, Roundup is not unusual for having many different labels with the same trade name. The 2001 North Dakota Weed Control Guide lists 10 different herbicides containing the name Roundup and another 31 different formulations containing glyphosate. A recent trip to Mills Fleet Farm here in Fargo found 12 more products available for home owners.

With some non-pesticide products, you can often substitute the generic brand for the usually more expensive name brand without causing harm. For example, if you are sick and ask for a "Kleenex" to blow your nose, you might find yourself sneezing into a generic tissue. This other brand may not be quite as comfortable on your nose, but the instructions for facial tissue usually do not differ. However, if you do not know what pesticide product you are using, you probably are applying the pesticide product inconsistent with its labeling.

***Be specific and read the label first.***

# Certification Now Required for Commercial Applications of General Use Pesticides

As of Aug. 1, 2001, people who apply general use pesticides for hire (commercial applicators) will be required to be certified. They will also be required to be certified to purchase general use pesticides if those pesticides are intended for commercial use. The law was passed nearly unanimously by the 2001 North Dakota Legislature. The law was formerly known as SB 2167.

The salient passages in the North Dakota Century Code can be found below. (Note: the strike-through text equals old language and the underline text equals new language.)

## **4-35-05.6**

*“Commercial applicator” means a certified applicator, ~~whether or not the applicator is a private applicator with respect to some uses,~~ who uses any pesticide ~~which is classified for restricted use,~~ for any purpose or on any property, other than as provided for by ~~subdivision b~~ a private applicator.*

## **4-35-05.2326**

*“Private applicator” means a certified applicator who uses or supervises the use of any pesticide that is classified for restricted use, to produce any agricultural commodity on property owned or rented by the applicator or the applicator’s employer or, if applied without compensation other than trading of personal services between producers of agricultural commodities, on the property of another person.*

## **4-35-09.1**

*No person who would be a Δ commercial applicator ~~if certified~~ may not purchase or use a ~~restricted use~~ pesticide without first complying with the certification standards and requirements of this chapter, or other restrictions as may be determined by the board.*

The entire text of the law is posted at: <http://ndsupesticide.org>

This will have major implications for the Certification Program. It will no doubt increase the number of commercial applicators participating in the program. How many is an open question. A modest increase is expected in traditional agriculture categories since most are already in the program. However, non-traditional or urban applicator numbers could increase substantially.

What follows are estimates that are being used for planning purposes.

- Agriculture categories—10 to 15% increase in certifications
- Non-agriculture categories:
  - Ornamental and Turf Grass or lawn care—100 to 150% increase in certifications
  - Pest Control Operators or rodent, roach, and mosquito control — 20 to 30% increase in certifications.
- Other, as yet identified — perhaps 50 or 100 new certifications in water treatment, livestock pest control, and/or oil drilling bacteria control.

Compliance with the new law will require time. The North Dakota Department of Agriculture (NDDA), which is charged with enforcing the law, has pledged flexibility. Their goal is it to get people trained and certified in major categories by April 1, 2002 and at the same time work toward full minor category compliance over the next 12 to 18 months. This does not mean the NDDA will be allowing a defacto grace period to be in effect. But it is going to try to use warnings and letters of non-compliance rather than fines as a means to get people certified.

The NDSU Training and Certification Program is gearing up to handle the influx of new applicators by offering more training sessions in both major and minor categories in the 2001-2002 training season. We will also be sending out direct mailings and newsreleases to get the word out.

We’re optimistic that we will be ready to meet the new demands placed upon us by the Legislature.

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## Request Training Materials and More On-line With Our Secure Web Server

This June the NDSU Pesticide Training and Certification Program established a secure Web server for on-line credit card ordering of certification study materials. By the end of the summer you will also be able to register for 2001-2002 Certification Trainings on-line. Simply navigate to our web site at: <http://ndsupesticide.org>. Look under “What’s Hot” or select the green “Training Opportunities” button. Follow the links to our secure server, and if you want additional information on how to use our on-line system you can find help pages as well.

This system has been established in response to your requests, so make use of it (dozens already have). You can access it 24 hours a day and it speeds up the processing of study materials dramatically. In most cases you can have study materials in your hands in three business days or less. Plus, it cuts down on mail and telephone call expenses. The time savings for us means that we will have just that much more time to respond to people who are not connected to the internet. All of this results in faster service for everyone.

## Financial Responsibility Requirement Maintained—Streamlined

As reported in the April issue of Pesticide Quarterly, the 2001 North Dakota Legislature has once again revamped the financial responsibility (FR) requirement for commercial pesticide applicators. As of August 1, 2001, applicators will have to demonstrate proof of FR by presenting evidence to the NDSU Extension Pesticide Program only at the time of certification. Thereafter, proof of FR must be made available upon demand by the North Dakota Department of Agriculture (NDDA).

Annual proof of FR will no longer need to be submitted to maintain certification. However, if in the course of a routine pesticide use inspection by the NDDA or in a random audit the NDDA finds that you have not maintained your FR, they may instantly suspend your certification and/or add additional fines.

The revised law maintains the same dollar minimums (\$100,000) and still requires only **general liability** coverage if insurance is used to demonstrate FR.

See the attached explanation and waiver available in this issue for more information or visit the Pesticide program web site at: <http://ndsupesticide.org>

# Financial Responsibility Law

## North Dakota Commercial Pesticide Certification

*Section 4-35-09.1 of the North Dakota Century Code  
as amended by the 2001 Legislative Session*

A commercial pesticide certificate may not be issued or renewed unless the applicant furnishes proof of financial responsibility or a waiver. Exemptions are allowed under this law. You may qualify for an exemption, refer to the N.D. Financial Responsibility Waiver form for exemption descriptions.

A commercial pesticide applicator must provide proof of financial responsibility on demand to the agriculture commissioner or inspectors of the North Dakota Department of Agriculture. Failure to maintain the minimum financial responsibility standards will result in immediate suspension of your certification and/or other enforcement actions.

Minimum financial responsibility must be maintained in the amount of \$100,000 and may be demonstrated as follows:

- A notarized letter from an officer of a financial institution or from a certified public accountant attesting to the existence of net assets equal to at least \$100,000, or
- A performance bond of no less than \$100,000, or
- A general liability insurance policy of no less than \$100,000

An employee of a commercial pesticide application business is not required to meet these standards separately. The employer of the applicator is responsible for providing financial responsibility documentation for employees.

NDSU Extension Pesticide Program  
PO Box 5051 NDSU  
Fargo ND 58105-5051

Phone: 701/231-7180, ext. #2  
Fax: 701/231-8474  
Email: [pesticid@ndsuext.nodak.edu](mailto:pesticid@ndsuext.nodak.edu)  
[www.ndsupesticide.org](http://www.ndsupesticide.org)

5/16/2001

# N.D. Financial Responsibility Waiver

Applicant Name \_\_\_\_\_

Commercial Pesticide Certification ID Number (If applicable) \_\_\_\_\_

Applicant Address \_\_\_\_\_  
street city state zip

Applicant Home Phone (\_\_\_\_\_) \_\_\_\_\_ E-Mail \_\_\_\_\_

Employer Business Name \_\_\_\_\_

Employer Business Address \_\_\_\_\_  
street city state zip

Employer Phone (\_\_\_\_\_) \_\_\_\_\_ Employer Fax (\_\_\_\_\_) \_\_\_\_\_

Applicant Signature \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

---

## I request that my financial responsibility requirement be waived due to the following:

1. \_\_\_ I Consult or Recommend ONLY. I will not make a commercial pesticide application.
2. \_\_\_ I am a Dealer ONLY. I will not make a commercial pesticide application.
3. \_\_\_ My status is NOT active. I will not make a commercial pesticide application.  
(If your status changes, you **must notify** the NDSU Extension Pesticide office.)
4. \_\_\_ I am a rancher or farmer that must obtain a commercial certification to control noxious weeds on leased Federal Lands.
5. \_\_\_ I am an employee of a Government Agency.
6. \_\_\_ I will commercially apply pesticides ONLY as an employee or an agent of a company or individual who has demonstrated proof of financial responsibility on my behalf.  
Complete the following:  
My employer provides financial responsibility in the following way: (choose one)  
 A notarized letter. (Attach a copy to this waiver and submit to the address below.)  
 A performance bond. (Attach a copy to this waiver and submit to the address below.)  
 A general liability insurance policy. (Complete the following or attach a copy to this waiver and submit to the address below.)  
Insurance Company Name \_\_\_\_\_  
Insurance Company Address \_\_\_\_\_  
Insurance Policy Number \_\_\_\_\_ Expiration Date \_\_\_\_/\_\_\_\_/\_\_\_\_
7. \_\_\_ I hold a Right-of-Way certification and I apply pesticides only on non-annual crop land, grasslands, or tame hay for the control of noxious weeds.

NDSU Extension Pesticide Program  
PO Box 5051 NDSU  
 Fargo ND 58105-5051

Phone: 701/231-7180 Extension - #2  
Fax: 701/231-8474  
Email: [pesticid@ndsuxext.nodak.edu](mailto:pesticid@ndsuxext.nodak.edu)  
[www.ndsupesticide.org](http://www.ndsupesticide.org)

5/16/2001

# Nine Year Testing Rule to be Abolished

Certificate holders whose certifications expire in 2002 and beyond will no longer be required to take a ninth year monitored exam to maintain their status. This will be the case for both commercial and private certificates. The rule change will streamline and reduce confusion for the recertification process. It also places additional emphasis on training or continuing education rather than testing as a means of maintaining certification.

This rule change was initially approved by the North Dakota Pesticide Control Board (NDPCB) at its December 2000 meeting in Fargo. The proposed rule was officially advertised and a hearing was held in April of 2001. No negative comments on the proposed rule were heard. In June the NDPCB approved the final rule submission to the North Dakota Attorney General and to the Legislative Council for review. If the reviews go as expected, the new rule

removing the nine-year testing requirement will be official sometime in September of 2001.

What does this mean in 2002 and beyond? It means that you will only be required to take a monitored exam when you first come into the program or if you add a category. Of course, if you let your certification expire, you will also have to take a monitored exam.

To maintain a certification, certificate holders will need to participate every three years in a recertification training, or if you are in a minor category you may recertify via a home correspondence course. If you do not participate in a training or are not eligible for a home correspondence course you will have to take a monitored exam again to maintain your certification. What follows is a table showing testing and training methods for obtaining or maintaining certification(s).

<b>Examination and Training Methods for Pesticide Certification.</b>			
Status (commercial and private)	Monitored Exam	Recertification Training	Recertification via Home Correspondence Course
New — requesting certification for the first time	X		
Currently certified and adding a new category	X		
Expired certificate	X		
Major category — recertifying*	X	X	
Minor category — recertifying**	X	X	X
<p>* Major Categories — Agricultural Pest Control, Fumigation, Research and Demonstration, Right of Way, and Seed Treatment.</p> <p>** Minor Categories — Home Industrial and Institutional, Metam Sodium, Ornamental and Turf, Public Health, Vertebrate, and Wood Preservation.</p>			

# Old Pesticides - Okay to Use?

*From the Oregon State Department of Agriculture Spring 2001 Newsletter*

Many growers may hold the philosophy, "As long as the crop is stated on the pesticide label that pesticide is legal to use on that crop." While using this philosophy in the past rarely posed problems, it may now put your crop at risk, especially when using older pesticides.

The concern stems from the fact that a tolerance for that pesticide on that crop may no longer exist. A tolerance is the amount of pesticide residue allowed to remain in or on a treated food commodity at the time of harvest. In contrast to years past, the Environmental Protection Agency (EPA) has been revoking tolerances much faster once an active ingredient is no longer registered for use on certain crops. A revoked tolerance makes any remaining pesticide residue illegal. Thus, growers may be gambling with their crop if they apply outdated pesticides and are unsure of the status of the tolerance.

Amiben (a.i. chloramben) is an example of a pesticide in which all tolerances have been revoked. Although it may not be a violation of state law to use a pesticide in which the tolerances have been revoked, it is a violation of the Federal Food Drug and Cosmetic Act Sec 408 [6a] "requirement for tolerance or exemption". Crops treated with Amiben may be prohibited from entering into commerce, subject to embargo, and possibly destroyed.

For a list of revoked tolerances see: [www.epa.gov/opp00001/tolerance](http://www.epa.gov/opp00001/tolerance)

*continued*

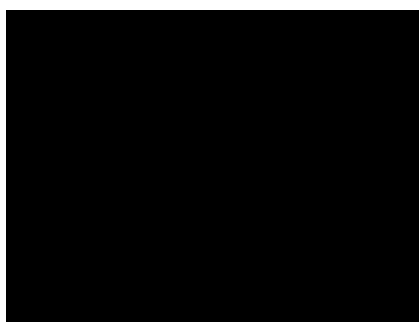
NDSU Extension Service  
Pesticide Programs  
Box 5051  
Fargo, ND 58105-5051

**Address Service Requested**

Non Profit Org.  
U.S. Postage

**Paid**

Permit No. 818  
Fargo, N. Dak.



## **Old pesticides — why does EPA revoke a tolerance?**

Under the Food Quality Protection Act (FQPA) the Environmental Protection Agency (EPA) is mandated to reassess all the pesticide tolerances and exemptions that were in effect as of 1996. This effort is designed to ensure that existing tolerances and exemptions meet the safety standard set by FQPA. During the reassessment process EPA may choose to revoke the tolerances for one of several reasons.

In some instances, EPA can propose a tolerance revocation if the pesticide is no longer being used on commodities grown within the United States, and no person has provided comment identifying a need to retain tolerances for imported foods. In these situations, regulators have determined that

tolerances are not necessary and project that retention of these unnecessary tolerances may lead to misuse of pesticides within the United States.

EPA will also propose revocations if the registration of a pesticide was canceled because the registrant failed to pay the required maintenance fee and/or the registrant voluntarily canceled all registered uses associated with the tolerance revocations for the pesticide.

Generally, EPA will only proceed with the revocation of the tolerances if (1) interested parties retract comments identifying a need for the tolerance to be retained, (2) EPA independently verifies that the tolerance is no longer needed, (3) the tolerance is not supported by data, or (4) the tolerance does not meet the requirements under FQPA.

EPA's policy is to issue a final rule revoking tolerances for residues of pesticide chemicals for which there are no active registrations under FIFRA.

**Need help with  
pesticide certification or  
general pesticide use issues?**

**Contact:**

NDSU Pesticide Training and  
Certification Program  
Box 5051, Fargo, ND 58105-5051

Tel: 701-231-7180  
Fax: 701-231-8474  
E-mail: [pesticid@ndsuext.nodak.edu](mailto:pesticid@ndsuext.nodak.edu)  
Internet: [www.ag.ndsu.nodak.edu/  
aginfo/pesticid/pesticid.htm](http://www.ag.ndsu.nodak.edu/aginfo/pesticid/pesticid.htm)