

Herbicide / Drift / Grapes Perspective

11-3-12

Lincoln, NE

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Pesticide Drift can be a VERY Emotional Issue!!



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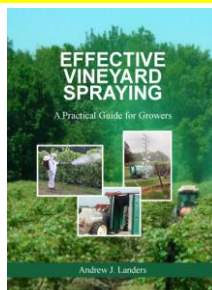
Think, before pointing fingers!



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Excellent Resource for Proper Vineyard Spraying



<http://www.effectivespraying.com/>

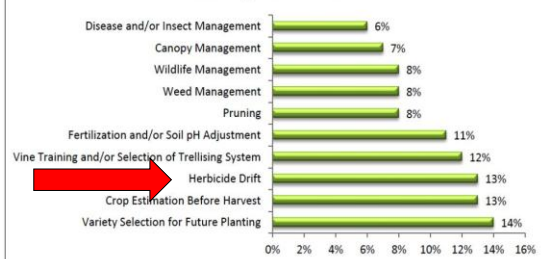
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Approx. \$61 with postage.

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2011 NASS Illinois Vineyard & Winery Survey

Ranking of Most Challenging Vineyard Management Tasks



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2011 NASS Illinois Vineyard & Winery Survey

Percent of Vineyards Reporting Damage and Acres Affected by Herbicide Drift From 2007 to 2011^a

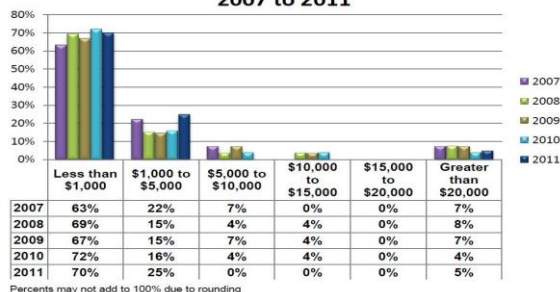
Region	2007		2008		2009		2010		2011	
	% of Vineyards Reporting	Acres Damaged	% of Vineyards Reporting	Acres Damaged	% of Vineyards Reporting	Acres Damaged	% of Vineyards Reporting	Acres Damaged	% of Vineyards Reporting	Acres Damaged
Northern	5%	26	5%	25	5%	16	5%	10	2%	5
Central	7%	28	6%	29	6%	27	7%	23	6%	23
South Central	7%	31	9%	34	9%	35	7%	29	7%	24
Southern	5%	7	4%	6	4%	10	5%	10	3%	10
STATE	24%	92	24%	94	24%	88	24%	72	18%	62

^a Statistics were based on reporter's recollection of damage prior to 2011 and percents were calculated using the 2011 vineyard count.

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2011 NASS Illinois Vineyard & Winery Survey Estimated Damage Due to Herbicided Drift from 2007 to 2011



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History of the Big Three

1941 2,4-D, 2,4,5-T and MCPA Patents filed by Imperial Chemical Industries in England. Patents were not published until 1945 after the war.

1945 2,4-D marketed in U.S. by AmChem for public testing under the brand name "WEEDONE"

1967 Dicamba Introduced by Velsicol Chemical Corporation as Banvel, later manufactured and marketed by Sandoz AG (now Syngenta AG). Now marketed in USA and Canada by BASF, and elsewhere by Syngenta.

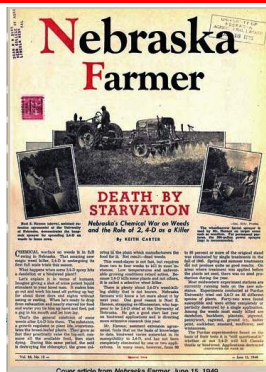
1974 Roundup herbicide introduced by Monsanto

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One of the first farmers in the nation to try 2,4-D was Carl H. Leonard of Wayne County, Nebraska. In 1947, *Nebraska Farmer* magazine reported, "[Last season,] he had cockleburrs in the corn rows that got ahead of the cultivators. The weeds were about as tall as the corn in the rows. One spraying of these cockleburrs with 2,4-D ended their earthly pilgrimage."

http://www.livinghistoryfarm.org/farming1the40s/pests_03.html



Cover article from Nebraska Farmer, June 15, 1949.

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Current Iowa Law

21-45.27(206) Use of high volatile esters. The use of high volatile esters formulations of 2,4-D and 2,4,5-T, the alcohol fraction of which contains five or fewer carbons, shall be prohibited in the counties of Harrison, Mills, Lee, Muscatine and that part of Pottawattamie county west of Range 41 West of the 5th P.M. to become effective upon filing.

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Dr. Bob Skirvin, Univ. of IL. at Urbana - Champaign

Genetic Engineering Produces 2,4-D Resistant Grape

10-14-08 University of Illinois announces that Dr. Bob Skirvin has used genetic engineering to produce "Improved Chancellor", a 2,4-D resistant Grape

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Dow AgroSciences

- New 2,4-D Choline chemistry to be pre-mixed with glyphosate for GMO herbicide tolerant corn, soybeans and cotton.
- 2,4-D Choline chemistry shown to have 90% less volatility than the conventional 2,4-D low volatile ester
- Available in 2013 for Corn
- Available in 2015 for Soybeans

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<http://www.enlist.com/>

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Engenia – New low volatile dicamba for release in 2014 on soybeans

Engenia will use BAPMA, N, N-Bis-(aminopropyl) methylamine. BAPMA "is a tridentate amine, that provides strong and effective binding of dicamba spray residues.

40% less volatile than current formulations

Roundup Ready 2 Xtend scheduled for release in 2014 for GMO herbicide tolerant soybeans.

Low volatile dicamba & Roundup & polyplastic polymer in mix to reduce volatility of new dicamba over 90%



PHENOXY Drift



2,4-D & dicamba (Banvel)

Hormone-Type Herbicides

Common Name	Trade Names	Common Use Sites
2,4-D	2,4-D, LV-4, LV-6, Salvus, Savage, Weedone and other names	Corn, sorghum, cereals, fallow, noncropland, pasture, rangeland, lawn and turf
2,4-DB	Butrol, Butoxone, Butrac	Soybean and alfalfa
MCPA	MCPA Amine, MCPA Ester, Rhumene and other names	Cereals, lawn and turf
MCPB	Thiostol	Controls Canada thistle
Picoprop	MCPP	Lawn and turf
dicamba	Banvel, Clarix, Dactol and Vanquish	Lawn and turf
clopyralid	Stinger, Reclaim and Transline	Corn, pasture, rangeland and noncropland
fluoroxypyr	Starane and Vista	Cereals and noncropland
picloram	Tordon	Pasture, rangeland and noncropland
triclopyr	Garlon and Remedy	Pasture, rangeland and noncropland
quinclorac	Paramount	Sorghum and fallow
amino pyralide	Milestone, Milestone VM	range, pasture, industrial

Common Tank Mixes of Hormone-Type Herbicide

Common Name	Trade Names	Common Use Sites
Triclopyr + 2,4-D	Crossbow and Chaser	Pasture, rangeland, noncropland and turf
Picloram + 2,4-D	Grazon P & D	Pasture and rangeland
Clopyralid + triclopyr	Redeem and Confront	Pasture, rangeland, noncropland and turf
2,4-D + dicamba	Weedmaster	Pasture, rangeland, fallow and noncropland
2,4-D + clopyralid	Curtail	Cereals, pasture, rangeland and noncropland
2,4-D + MCPA + dicamba	Trimec and Mec Amine	Lawn and turf
2,4-D + amino pyralide	Forefront R&P	range and pasture
fluoroxypyr + amino pyralide	ClearWave	wheat

Phenoxy Herbicide Injury can:

1. Reduce Yield
2. Reduce Fruit Quality
3. Affect Ripening
4. Reduce Winter Hardiness
5. Reduce Overall Growth
6. Affect Next Year's Growth
7. Kill the Plant

The dose & timing determines the poison.

Phenoxy Symptoms



Uneven
Ripening

Poor Pollination



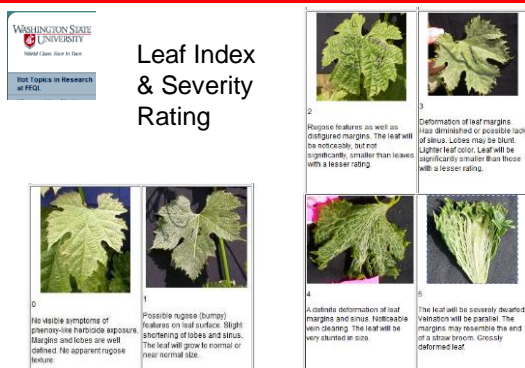
Phenoxy Injury cont....



2,4-D injury to successive nodes. The dose & timing determines the extent of the injury.



Typical symptom of Dicamba injury causing leaf to cup downwards.



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Washington State Department of Agriculture
Leaf Indexing Report Form

Completed forms should be mailed to:
WSDA Pesticide Management Division
21 N. 1st Ave., Suite #236
Yakima, WA 98902

Phone: 509-225-2647 Fax: 509-575-2210

Name / Contact: _____
Phone #: _____
Vineyard Name: _____
Location: _____
County: _____
Section: _____ Township: _____ Range: _____

Varieties Affected

Variety	Bud Break	Bloom	Set	Pea Size

Location (Block, Row): _____
Make observations at least once a week/ One variety per sheet

Variety	Year	Emergent Leaf Position	Observation Date	Any Phenoxy Symptoms Observed? Yes or No	Severity Rating Scale 0-5	Did it Rain? Yes or No	Date	Amount	Duration	Wind Dir.
I Basal										

IOWA STATE UNIVERSITY Extension and Outreach <http://feql.wsu.edu/eb/leafindex.pdf> 20

PHENOXY DRIFT MANAGEMENT

May/June Highest Damage Potential.

Keep dicamba 1 mile away from grapes.

Keep 2,4-D ½ mile away from grapes.
(suggest using 2,4-D amine instead of Low Vol Ester)

Dicamba and/or 2,4-D not a problem from dormancy to bud break.

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What is Spray Drift

The EPA defines spray or dust drift as: "the physical movement of pesticide droplets or particles through the air at the time of pesticide application or soon thereafter from the target site to any non- or off-target site. Spray drift shall not include movement of pesticides to non- or off-target sites caused by erosion, migration, volatility, or windblown soil particles that occurs after application or application of fumigants unless specifically addressed on the product label with respect to drift control requirements."

IOWA STATE UNIVERSITY Extension and Outreach EPA (PR Notice 2001-X) 12-19-01 22

Pesticide Drift is Not Trespassing

Pesticide that drifts onto an organic farm is negligence -- not trespassing -- the Minnesota Supreme Court said Wednesday

Environmental lawyers said the decision provides important clarification of the legal recourse for Minnesotans who have been harmed by drifting pollution, anything from pesticide to soot. Rather than simply proving that drift has occurred, which is what the Appeals Court decided in the pesticide case, plaintiffs must prove negligence and, in order to win damages, they also have to prove harm.

Supreme Court rejects pesticide trespass 8-1-12 Minneapolis Star Tribune:
<http://www.startribune.com/local/164607876.html?refer=y>

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Table 1. Herbicides that have potential to injure grapes.

Growth regulators			ALS inhibitors			
2,4-D	Dicamba	Others	Glyphosate	Sulfonylurea	Imidazolinone	Others
Amine 4	Banvel	Bronate*	Roundup	Ally	Arsenal	Gramoxone
Barrage	Clarity	Crossbow*	Rodeo	Ally Extra	Assert	Aim
Esteron 99	Rave*	Curtail*	Roundup Ultra	Amber	Beyond	Boa
Formula 40		Landmaster*	Roundup	Canvas	Pursuit	
Hi Dep		MCPA	UltraMax	Cimarron	Raptor	
LV-4		RT Master	Roundup	Express	Plateau	
LV-6		Starane	WeatherMax	Finesse		
Saber		Tordon	Landmaster*	Glenn		
Salvo		Turflon	Glyphos	Harmony Extra		
Savage		Trinec	Glypro	Harmony GT		
Tricep			RT Master	Oust		
Weedar 64			Touchdown	Peak		
Weed-B-Gon				Rave*		
Weedmaster						
Weedone						

This list is not all-inclusive; other herbicides also may injure grapes.
*A prepackage mixture containing a growth-regulator herbicide as at least one active ingredient.

From: Preventing Herbicide Drift & Injury in Grapes, Oregon State Univ. 3/04

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Misc. Herbicide Drift Injury



Callisto Injury
Pigment Inhibitor



FIGURE 107. Symptoms of Accent injury.



FIGURE 108. Symptoms of Firststate injury.

Sulfonyleurea Herbicide Injury
Midwest Grape Production Guide

Root Update Herbicide Injury Examples



Gramaxone Injury
Michigan State Univ.



Simazine (Princep) Injury

How to
reduce the
potential of
herbicide
drift.

Protecting Pesticide Sensitive Crops

Clyde L. Ogg, Extension Pesticide Education Coordinator; Erin C. Bauer, Extension Associate; Greg R. Kruger, Extension Cropping Systems Specialist; Pierce J. Hansen, Extension Assistant; Janet R. Hygstrom, Project Coordinator; and Craig L. Romary, Environmental Programs Specialist, Nebraska Department of Agriculture

This NebGuide examines how to protect sensitive crops, such as those found on organic and traditional commercial farms or in vineyards, from pesticide injury.

Pesticide sensitive crops, such as grapes in vineyards or fruit, vegetable, and ornamental crops grown on organic or traditional commercial farms, are becoming more common in the landscape. Consumer demand has created markets for these products, and sales of these crops have contributed to the state's agricultural economic diversity. Even though any agricultural crop can be damaged by pesticide drift, these crops are especially sensitive to injury by pesticides; the potential for economic loss is significant. For example, grapes have an annual fruit value of \$4,000 to \$5,000 per acre and the processed value can be up to 10 times higher (Figure 1).



Figure 1. Fruit crops such as grapes contribute to Nebraska's agricultural economic diversity (Lance Fox, Kansas Department of Agriculture).

<http://www.ianrpubs.unl.edu/eublic/live/g2179/build/g2179.pdf>



Iowa Department of Agriculture and Land Stewardship Bill Northey, Secretary of Agriculture



\$5 each

Sensitive Crops Directory

Applicators
Search for Sensitive Crops & Apianes

Producers
Register Sensitive Crops & Apianes

Sensitive Crops and Apianes
The Iowa Department of Agriculture and Land Stewardship has created a registry for producers to list the locations of their pesticide sensitive crops and for applicators to list the locations of their apianes. This registry will be used to create an on-line directory for use by pesticide applicators to identify the locations of sensitive crops and apianes and minimize the potential for pesticide drift damage.

Sensitive Crops
The Sensitive Crops Directory will provide pesticide applicators with the locations of those crops that are most susceptible to pesticide drift damage. The intended crops for inclusion in the registry are vineyards (minimum one acre), orchards (minimum one acre), certified organic crops (minimum one acre), and fruit and vegetable crops (minimum one acre). The crops at each registered location must be intended for commercial use, be susceptible to pesticide drift damage, and meet the minimum acreage requirements. The registry will accommodate the registration of multiple sensitive crop locations under one producer. If multiple crops are located in the same location, only the primary crop for that location need be listed.

http://www.agriculture.state.ia.us/Horticulture_and_FarmersMarkets/sensitiveCropDirectory.asp



<http://www.driftwatch.org/>



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Signs are worth a 1,000 words!³

Avoid Drift Prone Areas



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Buffers R Good!



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Share the map of your vineyard with neighbors and Ag Dealers.



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<http://maps.google.com/>

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Reducing The Risk Of Phenoxy Damage

1. Consider using a herbicide with a different active ingredient, such as glyphosate (Roundup), when you are trying to control difficult weeds such as blackberry or poison oak.
2. Fall applications of glyphosate tend to be more effective than spring applications.
3. If you need to use a phenoxy herbicide, decrease the risk of volatilization by using an amine (dimethylamine salt) formulation instead of an ester formulation.
4. Consider making applications in early spring before grapevines begin to grow or in the fall after their leaves have dropped.
5. Always use extreme caution when making applications where desirable vegetation is present and temperatures start warming up.
6. Monitor wind speed and direction closely.
7. Read and follow all label directions and precautions before using any pesticide.
8. Adding a spray-disking agent (drift retardant) may reduce spray drift, although recent evidence suggests some drift retardants may break up or lose their chemical integrity when applied or repeatedly passed through a spray pump.

Communicate With Your Neighbor

Let your neighbors know you have grapevines and that they are very sensitive to some herbicides. Recommend spraying before the vines bloom or use an alternative to phenoxy herbicides. Suggest spraying when the wind is calm or blowing away from your vineyard.

Who to Call If You Think Your Grapes Have Herbicide Effects

If you suspect that your vineyard is affected by a herbicide drift, contact the Pesticide Services of the Oklahoma Department of Agriculture, Food, and Forestry at 405-521-3864 for assistance, or visit our website to download a complaint form.

Use pesticides safely!

Read and Follow Directions



OKLAHOMA DEPARTMENT OF AGRICULTURE, FOOD AND FORESTRY
PO Box 13884
Oklahoma City OK 73153-8804
405-521-3864
Web Address
www.oda.state.ok.us

This publication is authorized by Toxic Pesticide Compensation Department of Agriculture, Food, and Forestry

Source: Revised Edition and Photo Credits
Oklahoma Department of Agriculture, Food, and Forestry

Protecting Oklahoma's Vineyards from Phenoxy (Hormone) Herbicide Effects



Wine grapes are a small acreage crop in Oklahoma, and are often surrounded by field or turf crops. Grapevines are very susceptible to certain herbicide drift. Many farmers do not realize the hazard that herbicides present to grapes.

Damaged Vines By Phenoxy Herbicide

Damage is often caused by Phenoxy (hormone) type herbicides which include 2,4-D, 2,4-DB, MCPA, MCPB, MCPP, Dicamba, Picloram, Clopyralid, and Trifluralin. Some of the trade names are Banvel, Basagran-M, Thibitol, Crotoneb, Garlon, Grazon ET, GrazonNVL, Reclaim, Reclaim, Renovo, Rhoxone, Turbide.

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<http://www.oda.state.ok.us/forms/cps/grapebroc.pdf>

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Some Grapes Show a Higher Tolerance to Phenoxy Herbicides Than Others

Brianna Cayuga White Chambourcin
Corot Noir Espirit Frontenac GR-7
LaCrescent LaCrosse Marechal Foch
Marquette Mars Noiret Prairie Star
Seyval St. Croix Traminette Valvin
Muscat Vignoles

But, don't bet the farm on these ratings!

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Table 4. Relative Disease Susceptibility and Chemical Sensitivity among Grape Cultivars.
The relative ratings in this chart apply to an average growing season under conditions usually favorable for disease development. Any given cultivar may be more or less severely affected depending on conditions.

	Susceptible or Sensitive to											
Cultivar	Black rot	Downy mildew	Powdery mildew	Bacterial	Phomopsis	Esca	Crown gall	Anthracnose	Sulfur ¹	Copper ²	2,4-D ³	dicamba ⁴
Aurora	+++	++	++	+++	+	+++	++	+	No	++	?	?
Baro Noir	+++	+	++	++	+	++	+++	+	No	?	?	?
Brianco	+	+	+	+	?	?	?	?	?	?	?	+
Cabernet Franc	+++	+++	+++	+	?	?	+++	++	No	?	+	+++
Cabernet Sauvignon	+++	+++	+++	+	+++	+++	+++	?	No	+	+	?
Canadice	+++	++	+	++	?	?	++	++	?	?	+	?
Catawba	+++	+++	++	+	+++	+	+	++	No	++	++	++
Cayuga White	+	++	+	+	++	+	+++	+++	No	+	+	+++
Chambourcin	+++	+	+++	++	+	?	++	+	Yes	?	+++	++
Chancellor	+	+++	+++	+	+++	+	+++	++	Yes	+++	++	?
Chardonnay	++	++	++	++	+++	++	++	+	No	?	++	+++
Chardonnay	++	+++	+++	+++	+++	+++	+++	+++	No	+	++	+++
Concord	+++	+	++	+	+++	+++	+	+	Yes	+	+++	++
Corot noir	+	+++	+	+	++	+	+	+	No	?	++	+++
Cynthiana/Norton	+	++	+	+	+	?	+	+	Yes	?	+++	+++
DeChasse	+	++	++	+	+++	+++	++	++	Yes	+	+	++
Delaware	++	+++ ⁵	++	+	+++	+	+	++	No	+	+++	?
Edelweiss	?	?	?	?	?	?	?	?	?	?	+	?
Emmet Seedless	+++	++	+++	+	?	?	+	?	?	?	+	?



The End

Thank You

