

Weed Control Options with Grapes

3-25-10

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Herbicide Control Ratings

Excellent	90% +
Good	80 – 90%
Fair	70 – 80%
Poor	< 70 %

Suppression – Poor to fair control and/or slows rate of growth.

Back Pack Pump Sprayers



Solo 425 DLX
90 psi max, pressure regulator
sprayer wt = 11 lbs.
Approx. \$120

Jacto CD 400
4 gal. internal pump, 3
nozzles
Approx. \$100.00



Berthoud Workhorse C-18
45 psi, mist nozzle, 4.75 gal.
Sprayer Weight = 10.85 lbs
Approx. \$160









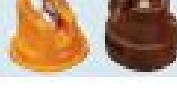
Nozzle Selection is Important!



Droplet Size Matters!



TeeJet® Broadcast Nozzle Selection Guide

		HERBICIDES		FUNGICIDES		
		SOIL APPLIED	POST-EMERGENCE		CONTACT	SYSTEMIC
			CONTACT	SYSTEMIC		
	Turbo TeeJet Reference page 9		VERY GOOD	VERY GOOD	VERY GOOD	VERY GOOD
	Turbo TeeJet at pressures below 30 PSI (2.0 bar) Reference page 9	GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT
	Turbo TwinJet Reference page 10	GOOD	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
	Turbo TwinJet at pressures below 30 PSI (2.0 bar) Reference page 10	VERY GOOD	VERY GOOD	EXCELLENT	VERY GOOD	EXCELLENT
	Turbo TeeJet Induction Reference page 11	EXCELLENT		EXCELLENT		EXCELLENT
	XR, XRC TeeJet Reference pages 12-13		EXCELLENT	GOOD	EXCELLENT	GOOD
	XR, XRC TeeJet at pressures below 30 PSI (2.0 bar) Reference pages 12-13	GOOD	GOOD	VERY GOOD	GOOD	VERY GOOD

Mathematical Calculations

fluid ounce = 6 teaspoons
= 2 tablespoons
= 29.57 milliliters

Cup = 8 fluid ounces
= 0.5 pint
= 16 tablespoons

1 gallon = 128 fluid ounces
= 8 pints
= 4 quarts
= 3.785 liters

acre = 43,560 square feet
= 0.405 hectares
= 4047 square meters

1% solution = 1.28 oz. per gallon = 32 oz. per 25 gallons
= 7.28 tsp. per gallon = 1 qt. per 25 gallons
= 2.56 tbsp. per gallon

area of a circle = radius squared x 3.1416 or
diameter squared x 0.7854

area of a rectangle = length x width

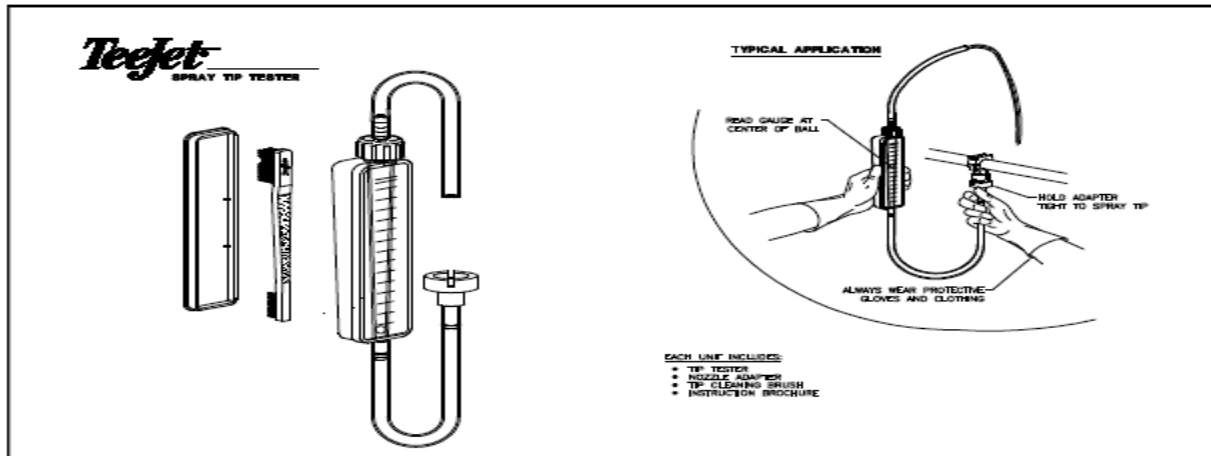
area of a triangle = (base x height)/2

Broadcast Sprayer Calibration

1. Fill sprayer tank with water.
2. Determine nozzle spacing in inches and measure appropriate distance in the field according to the following table:

<u>Nozzle Spacing (inches)</u>	<u>Travel Distance (feet)</u>
20 inches	204 feet
30 inches	136 feet
36 inches	113 feet
38 inches	107 feet
40 inches	102 feet

3. In the field, drive the designated distance at your normal spraying speed. Record travel time in seconds.
4. Set the designated pressure on the sprayer. With the sprayer parked, collect the output from each nozzle for the recorded travel time. Record the output from each nozzle separately.
5. Ounces collected per nozzle = gallons per acre for that nozzle.
6. Output per nozzle should not vary more than 5% from the average output of all the nozzles.

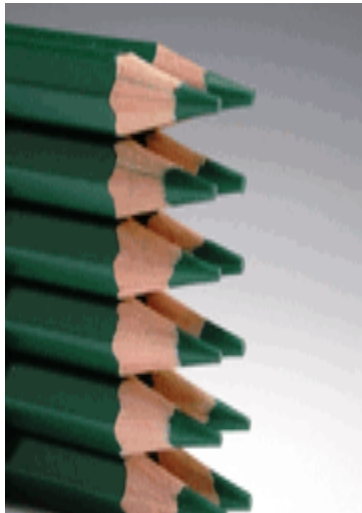


$$GPM = \frac{GPA \times MPH \times W}{5,940}$$

$$GPA = \frac{5,940 \times GMP}{MPH \times W}$$

$$MPH = \frac{\text{Feet Traveled}}{\text{Seconds}} \times \frac{60}{88} \quad \text{or} \quad \frac{60}{\text{Seconds to travel 88'}}$$

Where: GMP = Gallons/Minute/Nozzle
 GPA = Gallons/Acre
 MPH = Miles/Hour
 W = Nozzle Spacing in Inches
 = Row Spacing Inches / #
 Nozzles per Row



Grease Pencils work great for putting
mix notes on sprayer!

Weed Life Cycles

Summer Annual – germinate in spring and produce seed before fall.

Winter Annual – germinate in late summer or fall and produce seed the next spring or early summer.

Biennial – germinates in fall or spring, vegetative stage first years and reproductive stage 2nd year.

Simple Perennial – Survives several years and reproduces primarily from seed.

Creeping Perennial – Survives several years and reproduces by underground roots or stems and by seed.

Cultural Weed Control In The Vineyard

Smother Crops

ie: creeping red fescue, mustard and rape

Cover Crops

ie: spring rye, spring barley, spring wheat and oats

Drip Irrigation vs. Broadcast Irrigation

Night Tillage

Mulch

Solarization

Mulching

Minimum of 3” organic mulch depth needed for weed control



Synthetic Fabrics Work Well but are Costly.

Mechanical Weed Control



Pulling

Tillage

Hoeing

Propane

Burner

Boiling Water

Mowing



Biological Weed Control



Grazing Sheep



Grazing chickens,
geese or pheasants.

Types of Herbicides

Soil Applied – root and or shoot uptake

Pre-emergence – apply before seeds germinate

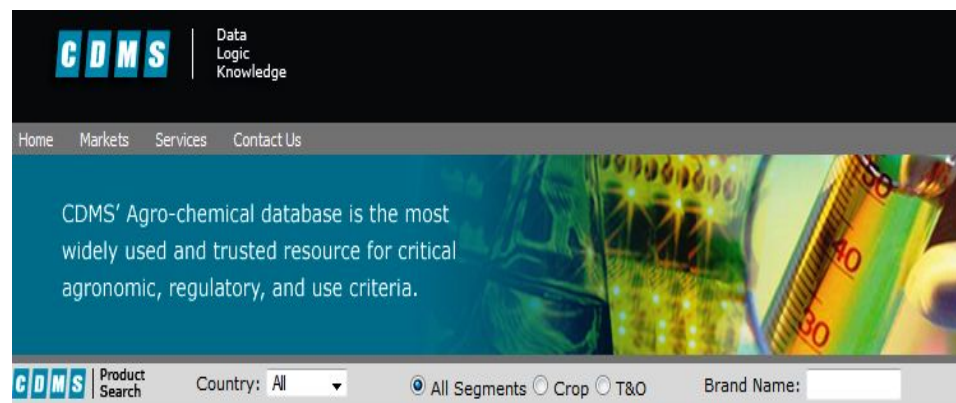
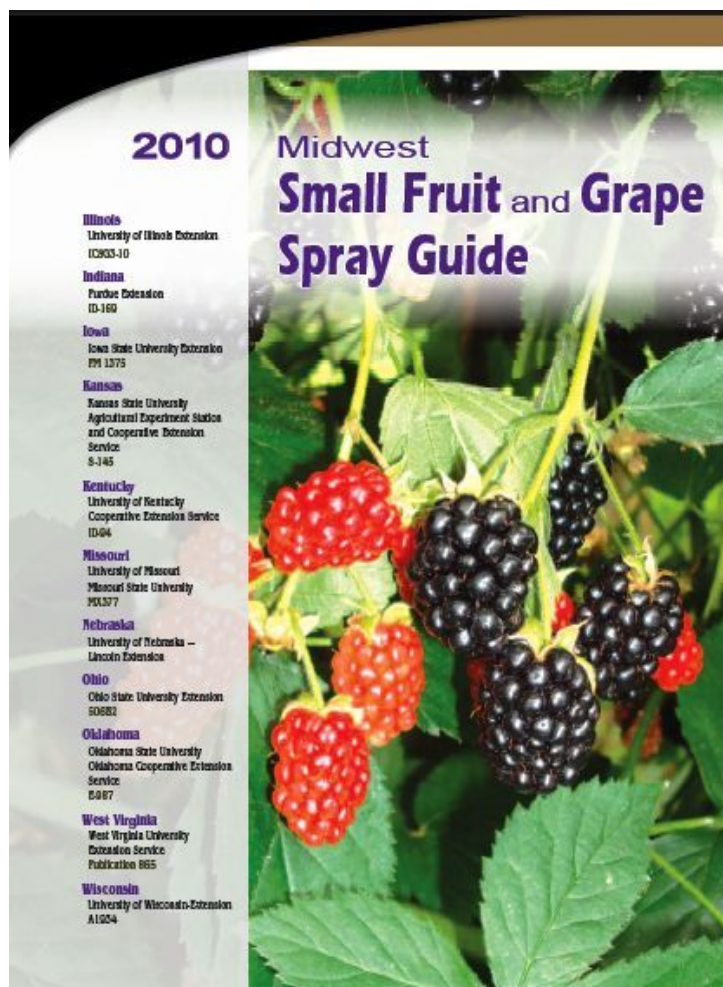
Pre-plant Incorporated (PPI) – soil incorporated

Post Emergence – foliage sprays

Contact – need good coverage over leaf surface

Systemic – translocation within plant. Can be soil or post applied to foliage

<http://www.cdms.net/LabelsMsds/LMDefault.aspx?t>



Labels / MSDS

Manufacturers

Other Search Options

Terms of Use

All Supporting Agro-Chemical Manufacturers

Acadian AgriTech

Aceto Agricultural Chemicals Corp.

AgraQuest, Inc.

Agrimar Corporation

Agro Logistic Systems, Inc.

Agsurf Corporation

Albaugh, Inc./Agri Star

Albion Advanced Nutrition

AmTide, LLC

MGK Company

Micro Flo Products (Arysta LifeScience)

Miller Chemical & Fertilizer Corp.

Mineral Research & Devel. Corp.

Monsanto Company

Monterey AgResources

Natural Industries, Inc.

Nichino America, Inc.

<http://www.extension.iastate.edu/Publications/PM1375.pdf>



Grapes: Organic Production

A Publication of ATTRA - National Sustainable Agriculture Information Service • 1-800-346-9140 • www.attra.ncat.org

By Rex Dufour
NCAT Agriculture
Specialist
© 2006 NCAT

Organic grape production provides a fairly predictable economic return in irrigated parts of the arid West. In the East, organic grape production is complicated by a climate that fosters insect and disease problems. Production is compounded by consumer preferences for grape cultivars (both dessert and wine grapes) that are difficult to grow in the East. This guide presents organic management options for diseases, insects and weeds, discusses cultivar choices in terms of disease resistance, and briefly presents marketing ideas for eastern labrusca-type grapes and organic wines. References and an appendix on disease resistance rating follow the narrative.

Contents

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- Geographical Considerations and Disease Management.....4
- Diseases.....5
- Geographical Considerations and Insect and Mite Management.....12



"Simply put: the principles of organic farming and sustainable practices are the single most important tools you can employ to improve wine quality." John Williams, owner, Frog's Leap Winery, Rutherford, California, speaking at the 54th Annual Meeting of the American Society for Enology and Viticulture (ASEV), June 20, 2003, Reno, Nevada.



Organic Small Fruit Disease Management Guidelines

Integrated Management of Grape Disease

Prepared by
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and
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Department of Plant Pathology
at the Ohio State University/OARDC

This PDF file is provided as a part of "OSU Fruit Disease Resources" web (<http://www.oardc.ohio-state.edu/fruitpathology/>).

2010

Production Guide for Organic Grapes



OMRI

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OMRI Lists

Organic Seeds

Subscribers

Certifiers

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Welcome to the Organic Materials Review Institute

Founded in 1997, the Organic Materials Review Institute (OMRI) provides organic certifiers, growers, manufacturers, and suppliers an independent review of products intended for use in certified organic production, handling, and processing. OMRI is a 501(c)3 nonprofit organization. When companies apply, OMRI reviews their products against the National Organic Standards. Acceptable products are OMRI Listed® and appear on the *OMRI Products List*. OMRI also provides subscribers and certifiers guidance on the acceptability of various material inputs in general under the National Organic Program.

Post Emergent Spray Adjuvants

Spreader/Sticker, ie.... Non-ionic surfactant.

Spreader/Sticker/Penetrant, ie Crop oil concentrate or methylated seed oil.

Fertilizer Spray Enhancer, ie... liquid 28% nitrogen or dry ammonium sulfate crystals. Softens the water.

Drift Inhibitors: ie...acrylic or silicone polymer that reduces spray drift by increasing viscosity and droplet size.

Compatibility Agents, ie..."Unite", "Dawn dishwashing detergent" helps incompatible products mix together.

Anti-Foaming Agent – eliminates foam buildup in the tank

Legal Classification

Restricted Use Pesticide (RUP) - A pesticide that could cause some human injury or environmental damage even when used as directed on the label. Need a Private Applicators License to purchase and apply.

General Use Pesticide - No license needed to purchase or apply.

WI Private Pesticide Applicators License

State & Federal law requires private pesticide applicators to have a license to apply and purchase RUP's.

WI County Extension administers the training & testing that must be completed every 5 yrs:

- 1 day training class, manual and 2 hour /70 question yes/no or multiple guess test costs \$30
- or self study the manual and take the test for \$30
- must get 70% (49) correct to pass

Wisconsin Dept. of Ag licensing info: 608-224-4548 or

<http://datcp.state.wi.us/core/insectspesticides/insectspesticides.jsp>

Private Applicator RUP Record Keeping Rules

Must keep records on all RUP applications for 2 years.

Have 14 days after the application to record information of pesticides applied by the private applicator.

Information to record:

Total Amount

Location

Size of Area

Crop, Commodity, or Site

Date

Name & License #

Product Name

EPA Registration #

Herbicides for Non-bearing Grapes



Do not apply within
12 months of harvest.

Basagran 4 L (bentazon)

General Use Pesticide, approximately \$110/gal. in 2.5 gal.

Postemergent, excellent range of annual broadleaf control

Include 1% by volume crop oil concentrator

Rates: 1.5 – 2pt./acre

48 hr. Re-entry Interval (REI)

Arysta



No
Longer
Labeled

Fusilade DX (fluazifop 2 lb. ai/gal)

General Use Pesticide, approximately \$220/1 gal. Container.

Post-emergent annual grass control.

Rates: 16 to 24 oz./acre

Crop Oil Concentrate or non-ionic adjuvant required.

Nonbearing Vines Only.

12 hr. REI

Syngenta

Gallery 75 DF/Gallery T & V (75% isoxaben)

General Use Pesticide, approximately \$164/lb. in 1 lb. pkg.

Pre-emergent broadleaf weed control

Apply in late summer, early fall, or early spring. Do not apply to new transplants until soil has settle and cracks have sealed.

Rates: 0.66 to 1.33 lbs./acre, 12 hr. REI

Dow AgroScience

Prowl 3.3 EC (pendimethalin)

General Use Pesticide, approximately \$41/gal in 2.5 gal.

PPI or pre-emergent annual grass and small seeded broadleaf weed control.

Apply only to dormant, non-bearing grapes. Do not apply if grape buds have started to swell.

Rates: 2.4 qts./acre = 4 month weed control

4.8 qts./acre = 6-8 month weed control

12 hr. REI

BASF

Select Max (12.6% clethodim)

General Use Pesticide, approximately \$155/gal. in 2.5 gals.

Post-emergent annual and perennial grass control.

Crop oil concentrate or non-ionic surfactant required.

Rates: 0.5 – 1% as a spot treatment

9 to 32 oz./acre, 24 hr. REI

Previously was sold as “Prism” (12.6% clethodim) or Select
(26.4% clethodim) **Valent**

SnapShot 2.5 TG (premix of isoxaben & Treflan)

General Use Pesticide, approximately \$2.30/lb. In 50 lb. Bags

Pre-emergent, with a excellent wide range of annual broadleaf and annual grass control.

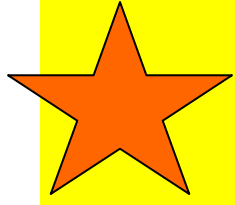
Do not apply to newly transplanted plants until soil has settled and cracks have closed.

Rates: 100 to 200 lbs./acre. 12 hr. REI

Dow AgroScience

Herbicides for Bearing Grapes





Aim 2 EW

(Carfentraxone ethyl 21.3% ai.)

General Use Pesticide, approximately. \$250/qt.

Postemergence Excellent broadleaf

1-2 fl. oz./acre Post-emergence activity.

Non-ionic and/or crop oil concentrate surfactants required.

Pigment inhibitor – cell membrane disruptor

3 day Preharvest Interval (PHI), 12 hr. Re-entry Interval (REI)

Can be sprayed on green suckers for Sucker Mgt.

FMC

Casoron or Norosac (dichlobenil 4% ai/lb)

General Use Pesticide, approximately \$3/lb. in 50 lb. bag.

Pre-emergence and PPI. Apply between November 15th to February 15th. If incorporated, do so prior to May 1st.

Weeds: Annual and perennial grasses and broadleaves.

Rates: 100 – 150 lbs./acre , 12 hr REI

Do not apply until **4 weeks after transplanting.**

ChemTura



Chateau WDG (Flumioxazin, 51% ai.)

General Use Pesticide, approximately \$102/lb. in 2.5 lb pkgs.

Post or Pre-emergent Excellent broadleaf, Good grass control.

4-6 oz./acre Post or Pre-emergence

Post – do not apply to lower 3' of plant unless leaves and green bark are protected.

Pigment inhibitor – cell membrane disruptor

Soil Type: Do not apply to soils >5% OM. Do not apply to fine textured soils. 60 day PHI, 12 hr. REI

Do not apply to grapes established less than 2 yrs.

Valent

Devinrol 50 DF (napropamide 50% ai/lb)

General Use Pesticide, approximately \$11/lb. In 4 lb. Pkgs.

Pre-emergent grass & broadleaf control.

Surface apply in fall or spring.

35 day PHI, 12 hr. REI

Rate: = 8 lbs per acre. Commonly applied in irrigation water.

(Can also be obtained as 10% granules.)

United Phosphorus Inc.

Diuron 80 WDG (diuron 80% ai/lb.)

General Use Pesticide, approximately \$6.50/lb. in 5 lb pkgs.

Pre-emergence or directed early post-emergent annual and some perennial grasses and broadleaves.

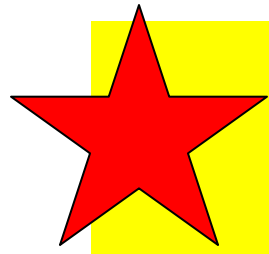
Apply to **3 year or older vineyards**, 12 hr. REI

Low clay or organic matter (1 – 2%) soil = 2 – 3 lbs/ac.

Higher clay and organic matter soil = 3 – 6 lbs/ac.

Apply in spring just prior to weed germination.

Griffin Chemical Company



(Generic glyphosate 4 lb/gal. ai)
(ie.. Generic Roundup)

General Use Pesticide: approximately \$13/gal. In 2.5 gal.

Directed post-emergent translocated non-selective herbicide.

Annual and perennial weed control.

Rates: 1 - 5% solution for spot treatments

1 pt. – 5 qt./acre

14 day **pre-harvest interval.**

Monsanto and generic manufacturers.



Goal 2XL (oxyfluorfen 2 lb ai/gal)

General Use Pesticide. Approximately \$99/gal in 2.5 gal.

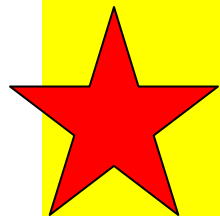
Pre-emergence and early post-emergence broadleaf and some grass control. Avoid plant contact.

Do not apply if leaves or fruit are present or buds have begun to swell. 14 day PHI, 24 hr. REI

Rates: 2 – 8 pts/acre post-emergence

5 – 8 pts./acre pre-emergence

Dow AgroScience



Gramoxone Inteon 2L
(31.3% paraquat, 2 lbs. ai./gal.)

Restricted Use Pesticide, approximately \$40/gal. in 2.5 gal.

Directed post-emergent contact non-selective herbicide.

Rates: 2.4– 4 pts./acre (Can be used for Sucker Control)

60 day PHI, 12 hr. REI

Non-ionic surfactant needed.

Syngenta Crop Protection

Note that the old Gramoxone Max = 43.3% ai

Kerb 50 WSP (pronamide 50% ai/lb)

Restricted Use Pesticide, approximately \$47/lb in 3 lb pkgs.

Pre-emergence and early post-emergence control of winter annual & perennial grasses and some broadleaves.

Apply in the fall after fruit harvest.

One year PHI for food crops, 24 hr. PHI

Spring set plants must be established for 6 months.

Rates: 2 – 4 lbs./acre. Not very effective on soils greater than 4% organic matter.

Dow AgroScience



Matrix SG

(rimsulfuron 25% ai/lb)

Restricted Use Pesticide, approximately \$18/oz in 15 oz pkgs.

Pre-emergence and early post-emergence control of annual broadleaves and some grasses.

Can be applied as a Fall treatment for winter annual broadleaf and dandelion control

14 Day PHI, 4 hr. REI

Do not apply to vines established less than 1 year. Apply as a directed band at the base of the vines.

Rates: 2-4 oz. in a minimum of 10 gal. of water/acre **Dupont**

Poast 1.5 EC (sethoxydim 1.5 lb. ai/gal)

General Use Pesticide, approximately \$89/gal. in 2.5gal. .

Post-emergent annual and some perennial grass control.

Rates: 1 – 1.5 % solution

12 – 40 oz./acre

Ammonium Sulfate (AMS), 28% nitrogen (UAM), Crop Oil Concentrate (COC), Dash, or Methylated Seed Oil (MSO) **spray adjuvant required.**

50 day PHI, 12 hr. REI

BASF



Princep 4L & 90 DF (simazine, 4 lbs. ai/gal. and 90% ai.)

General Use Pesticide, approximately \$30/gal. In 2.5 gal. and \$6/lb. in 10 lb. pkgs.

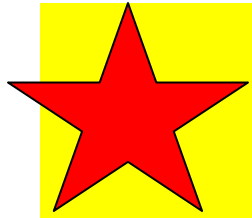
Pre-emergence or PPI . Primarily a broadleaf herbicide with some grass control. Excellent residual. Apply any time between harvest and weed emergence.

Use only on vineyards **established for 3 years or more.**

Rates: 4L = 2 – 4.8 qts./acre, 12 hr. REI

90 DF = 2.2 to 5.3 lbs./acre

Syngenta



Prowl H2O 3.8 (pendimethalin)

General Use Pesticide, approximately \$42/gal in 2.5 gal.

PPI or pre-emergent annual grass and small seeded broadleaf weed control.

90 day PHI, 24 hr. REI

Rates: 2 qts./acre = 4 month weed control

6 qts./acre = 6-8 month weed control

BASF

Scythe 4.2E (pelargonic acid 4.2 lbs./gal.)

General Use Pesticide, approximately \$70/gal.. in 2.5 gal. pkgs.

Post emergent grass and broadleaf control. Contact non-selective burndown. Can be mixed with glyphosate for added control.

Bio-control –57% pelargonic & 3% related fatty acids, apply to weeds less than 6”

Rate: apply 5-10% by volume. Apply when temperatures are above 70F and 2 hours prior to any rainfall.

0 day **Pre-harvest Interval (PHI)**, 12 hrs Re-entry Interval

Mycogen Corporation

Citrus Oil (limolene)

Organically Approved Herbicide

Post-emergent contact, nonselective annual and perennial weed seedling control.

Typical Mix = 2 oz. orange peel oil, 1 tablespoon of soap to 1 gallon of 10% pickling vinegar.

Dissolves waxy protective cuticle of leaf opening it up to desiccation. Limolene also used used for insect control too.

Sold as Green Match, Nature's Avenger, etc.....

Solicam 80DF (norflurazon 80% ai)

General Use Pesticide, approximately \$26/lb. in 10 lb pkgs.

PPI or Pre-emergent grass and broadleaf control. Must be irrigated into soil if rainfall does not occur within 4 weeks.

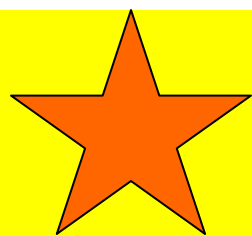
Pigment inhibitor – leaves turn white

Soil Type: sandy loam	- 2.5 lbs/ac
silt to silty loam	- 3.75 lbs/ac
silty clay loam to clay	- 5 lbs/ac

60 day PHI, 12 hr. REI

Do not apply until **24 months after planting**.

Syngenta



Surflan 4 AS (Oryzalin 4 lb. ai/gal)

General Use Pesticide - Approximately \$56/gal. in 2.5 gal.

PPI or Pre – emergent annual grasses and some small seeded broadleaves

<u>Length of Control</u>	<u>Qts/Ac</u>	<u>Time Between Applications</u>
2 – 4 months	2	2.5 months
6 - 8 months	4	2.5 months
8 - 12 months	6	2.5 months

12 hr. REI

Dow AgroScience & generic manufacturers

Treflan (trifluralin) - many formulations and manufacturers

General Use Pesticide, approximately \$27/ (4 lb./ai. gallon) in 2.5 gal. or \$1.3/lb.as a 10% granule in 50 lb. bags.

PPI required for the liquid. PPI or pre-emergence for granules.

Weeds: Annual grass and small seeded broadleaf control.

Rates: 1 to 4 pts./acre liquid

5 to 20 lbs./acre dry 10% granule

60 day PHI, 12 hr. REI

Dow AgroScience and generic manufacturers.



Rely 200 (glufosinate 2 lb. ai/gal)

General Use Pesticide, approximately \$50/gal. in 2.5 gal.

Post-emergent translocated, nonselective annual and perennial weed control.

Rates: 2.4 oz./gallon of water for spot treatments

58 oz./acre when weeds < 6" tall

96 oz. /acre when weeds > 6" tall

14 day PHI, 12 hr. REI

Bayer Crop Science

Last but not least!

Always Read and Follow Label
Directions

Thank You - Questions

Sources of Pesticides

1. Midwest Grower Supply, Stansberry, Mo (866-802-3431)
2. CPS Great Lakes, Galesburg, WI 800-551-5708
3. Asmus Farm Supply, Rake IA (641-566-3658)
<http://www.afschem.com/>
4. McCorkle Hardware, Columbia (641-943-2315)
5. CrossRoads Ag, Dallas Center (515-992-4391)
6. Local Fertilizer and Chemical Dealers.

Sources of Herbicide Sprayer Equipment

1. Sprayer Specialties, Grimes, IA 800-351-1587
2. TeeJet Midwest, Urbandale 515-270-8415
3. Northern Tool & Equipment, West Des Moines, IA:
<http://www.northerntool.com>
4. Gemplers: <http://www.gemplers.com>
5. Local Farm Supply Stores
6. Local Farm Equipment Dealers

WWW Pesticide Sites

ISU Pesticide and Environment (safety, regulations, calibration, etc...)
<<http://www.extension.iastate.edu/pme>>

ISU Weeds(huge collection of weed control and label references):
<<http://www.weeds.iastate.edu/>>

CDMS Labels and MSDS Sheets:
<<http://www.cdms.net/LabelsMsds/LMDefault.aspx>>

2010 Midwest Commercial Small Fruit & Grape Spray Guide:
<<https://www.extension.iastate.edu/store/ListItems.aspx?Keyword=pm%201375>>

Midwest Small Fruit Pest Management Handbook – 861:
<<http://www.ag.ohio-state.edu/~ohioline/b861/index>>

MN Private Pesticide Applicators License

Take 50 question exam and get 70% of questions correct.

License Fees = \$50 license fee every 3 years.

Renew license every 3 years by paying \$50 to retest or paying \$50 to attend a 3.5 hour recertification class

MN Pesticide Applicator License & Renewal Info:

<http://www.extension.umn.edu/pesticides/>

IA Private Pesticide Applicators License

Iowa Pesticide Act requires private pesticide applicators to have a license to apply and purchase RUP's.

Initially must take a 50 question multiple choice test and get 75% of questions correct.

License cost - \$15/3 years.

License holders must either retest each 3 years or attend a 2 hour \$20 recertification training course **each** year to renew license each 3 year period.

IA Dept of Ag Pesticide Bureau: 515-281-8591



Touchdown HiTech (52.3% glyphosate)

General Use Pesticide, approximately \$77/gal. in 2.5 gal.

Directed post-emergent translocated non-selective herbicide.

Annual and perennial weed control.

Apply to the end of bloom stage during harvest years.

20 - 32 oz./acre are typical rates.

14 day PHI, 4 hr. REI

(glyphosate replaced sulfosate as the active ingredient)

Syngenta