

EB845

COLLEGE OF AGRICULTURE & HOME ECONOMICS

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## CRANBERRY INSECT, DISEASE, & WEED CONTROL PROGRAM

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# SPRAY COMPATIBILITY (ABILITY TO MIX) CHART FOR FUNGICIDES AND INSECTICIDES

## Combining Chemicals

It may be to your advantage to control several problems with one spray by combining several chemicals. Read the label and follow the manufacturer's directions when making these mixtures. This compatibility chart is provided to help you in preliminary planning only. Compatibilities can vary from those indicated on this chart because of change in solvents and emulsifying agents, etc. It is a good idea before making a tank mixture to mix the chemicals in a jar of water at approximately the recommended dilution rate and look for any reactions that would cause solids to form and separate out of the solution. Some mixtures may create phytotoxicity problems (plant injury), so unless a label specifies otherwise, either experiment on a few plants or avoid doing it. Agitation is recommended when mixing and using mixtures of pesticides.

	Sevin	Orthene	Mancozeb	malathion	Lorsban	Kocide	Guthion	Funginex**	ferbam	diazinon	Bravo**	Bordeaux
Bordeaux	2	2	C	2	X		2	?	C	2		
**Bravo					C		1	?				
diazinon		C				2		3				2
ferbam					?	C						C
**Funginex	X	?	?	3	?	?	?			3	?	?
Guthion		X				2		?			1	2
Kocide	2	2	C	2	X		2	?	C	2		
Lorsban			C			X		?	?		C	X
malathion						2		3				2
Mancozeb					C	C		?				C
Orthene						2	X	?		C		2
Sevin						2		X				2

Blank = Normally compatible; however, most recent compatibility charts suggest not to mix unless approved by manufacturer.

C = Caution, may be incompatible or compatibility unknown.

X = Incompatible

1 = Use wettable or soluble powder forms

2 = Do not combine Bordeaux mixture or Kocide with an insecticide

3 = Use EC formulation

? = Compatibility profile unknown

\*\* Do not use a spreader-sticker with Bravo or Funginex

# 1995 Cranberry Insect, Disease and Weed Control Program

NOTE: WSU recommendations are based on the latest available information. However, occasionally they may differ from a label. If so, the label instructions supercede WSU instructions. Always check the label before using the chemical.

## Insect and Disease Control

The following information lists and describes chemical control measures suggested for the more common insect and disease pests of cranberries. The recommendations are based on research by Washington State University, the USDA, and other agencies. The materials suggested are considered safe to use (when directions on the label are followed carefully) and are known to be effective.

In many cases, additional information may be desired on description of these pests, their damage, their life cycle, and their control. If your problem goes beyond the scope of this discussion, you can get additional help from your county extension agent or by contacting one of the authors listed.

### PRECAUTIONS IN USING PESTICIDES

Before using any pesticide, you must have the product label in your possession. **READ and FOLLOW** all directions and precautions on the label. **Cranberries must be listed on the label of the material you use. Occasionally they will be on the label of one brand or formulation but not on another.**

Pesticides are poisonous to humans and animals. Use them only when needed and handle them with care.

Keep pesticides in closed containers in a dry place. Avoid freezing temperatures. Store them where they will not contaminate food, feed, or water sources; and preferably in locked storage where children and animals cannot reach them. Keep pesticides in their original containers.

**Be certain that the label permits chemigation of cranberries by a pesticide before applying it through the sprinkler system.**

Avoid contact with pesticides. If any is spilled on skin or clothing, wash it off the skin thoroughly with soap and water and change clothing immediately.

Avoid inhalation of pesticide dusts or mists.

When handling pesticides, wear clean, dry clothing.

Wear rubber gloves, approved for use with pesticides.

Wash your hands and face immediately after completing pesticide application.

Do not eat or smoke while handling pesticides or before washing.

To protect fish and wildlife, do not contaminate lakes, streams, or ponds with pesticide. Do not clean spraying equipment or dump excess spray material near such water.

Dispose of pesticide containers so they do not pose a threat to human beings or the environment. Rinse empty containers at least three times and pour the rinse water into the spray tank. Unless containers can be returned to the manufacturer or sold to a commercial salvage firm, they should also be punctured, crushed, or broken (except for aerosol cans) so they cannot be used for other purposes. They can then be taken to a sanitary landfill dump or other site approved by the local health department. Landfills currently accepting such containers are located in Aberdeen (360) 249-4222, and Long Beach (360) 642-2541. Call to verify their hours and conditions first. Burning empty pesticide containers can produce toxic fumes; such burning is prohibited by state air quality regulations. Dispose of pesticides no longer registered for use on cranberries. The time to do this is now. Inventory pesticides you have which fall into this category. Transfer product to producers of other crops that are still on the label. (Your distributor may be able to assist in the transfer.) Return product to the manufacturer for disposal where possible. Order only the amount of pesticides that you will use during the year. Use older material first. Contact your Cooperative Extension agent for other options.

### HEALTH HAZARDS

All pesticides are poisonous; *some are toxic in very small amount and may be absorbed through the skin or inhaled in quantities that endanger the health or even the life of the operator.* The degree of danger and the necessary precautions are indicated on pesticide container labels. *Read*

the manufacturer's label carefully and follow the instructions on it.

## WORKER PROTECTION STANDARD

The federal Worker Protection Standard (WPS) requires agricultural employers to protect their worker and handler employees from exposure to pesticides. This standard is comprehensive and complex. A "How to Comply" manual developed by EPA is available from a number of sources including county Extension offices.

## REENTRY TIMES

No one may enter a pesticide-treated field without wearing personal protective equipment specified on the label until the spray has dried or the dust has settled. A long reentry may have been assigned to a product so that no one may enter a field before the assigned time has elapsed. **Check the pesticide label for reentry times.** Assigned times may range from 24 hours to several days. If the reentry time is longer than 24 hours, the field must be posted against reentry. Call the Washington Labor & Industry Office (360) 956-5426 for details on protective clothing and on posting rules as new requirements became effective in April 1993.

## RESTRICTED USE PESTICIDES

Certain pesticides are designated restricted use." Only certified applicators may purchase and apply them. Check with your Cooperative Extension agent for a list of cranberry pesticides that carry restricted use designation.

## USING SPREADER-STICKER

Most modern insecticides and fungicides contain a spreader-sticker. It is often inadvisable and sometimes even dangerous to add a spreader-sticker to such formulations. (Check the label.) For example, do not add wetting agents or spreader-stickers to Bravo products. Also avoid using stickers with other pesticides and fertilizers 2 weeks before and 4 weeks after last Bravo application, if possible. If a spreader-sticker is recommended, after all other materials have been added to the spray tank, add the spreader-sticker according to directions on the spreader-sticker label, a little at a time. *Test the amount by dipping cranberry tip in spray mixture.* If enough spreader sticker has been added, the leaves will wet evenly and thoroughly on both sides. If not, the spray mixture will draw up in beads and drops. However, too much will cause the spray to run off the leaves and reduce the effectiveness of the pesticides.

## 8-8-100 BORDEAUX MIXTURE FORMULA

**Ingredients.** Use 8 pounds bluestone (copper sulfate) for each 100 gallons of water. Instant bluestone may be used directly from the container; crystalline bluestone must be dissolved in water first to form a stock solution. Use 8 pounds of freshly hydrated or slaked lime for each 100 gallons of water. Mix the lime with enough water to form a thin paste, strain through a 20-mesh screen to remove lumps.

**Mixing.** Fill spray tank about two-thirds full with water. Then pour the bluestone slowly into the spray tank while the agitator is running. After the bluestone has been added, put in the lime. Then add more water to fill the tank and add spreader-sticker. *Do not combine Bordeaux mixture or Kocide with an insecticide.*

## PHYTOPHTHORA ROOT ROT CONTROL

This fungal disease is usually most severe in low or poorly drained areas. The disease can be controlled by improving drainage and stimulating root growth. Improve drainage by digging new lateral ditches, maintaining existing ditches, or adding drain tile or pipe. Promote new root growth by sanding and fertilizing plants, especially those at the margins of the weak areas. Soil applications of the fungicide Ridomil have been beneficial when combined with modified soil drainage. Before using Ridomil, confirm that the Phytophthora fungus is present (check with the Extension Agent). Use Ridomil 2E for broadcast or chemigation treatment and Ridomil 5G for spot treatment. When spot treating apply Ridomil 10 feet into healthy vines. Apply granules when foliage is dry so granules fall through the canopy. Irrigate following application to move Ridomil into the soil. Retard spread of the pathogen by harvesting infected bogs last, and by using vines free of the pathogen when planting new bogs or renovating sections of established bogs.

## ROSE BLOOM CONTROL

Protect new upright and runner growth from spores produced on the surface of the pink fleshy growths. Effective control will reduce disease incidence (the number of rose bloom growths) the following spring. Start fungicidal protection when the growths first begin to take on a whitish cast; this marks the onset of spore production. For 'Stevens' this will be in early May (rough neck stage); and for 'McFarlin' and other cultivars, about 1 to 2 weeks later. Repeat at 14-day intervals until the growths wither (shriveled/dry up), but do not make more than three applications. Chemicals applied earlier in the spring do not cause the fleshy growths to wither before spores are produced.

## TWIG BLIGHT CONTROL

Onset of infection and need for fungicidal protection are linked to spore development. An IPM (integrated pest management) scout will monitor the spores and notify growers when to make first applications. Repeat at 14-day intervals for a total of three applications. Effective control will reduce disease incidence (the number of blighted uprights) the following spring. Protect newly planted bogs if infected bogs grow nearby.

## ROOT WEEVIL AND GRUB CONTROL

**Strawberry Root\* and Black Vine Weevil Control.** Black vine weevil is the most common species. Apply 13.3 pounds of Furadan 15G per acre. Spread granules evenly over the soil surface with a granule applicator. Apply between June 15 and 25 and repeat one month later. Follow application by sprinkler irrigation. Use only on bogs that are not flooded for irrigation, harvest, or any other purpose. Do not apply within 60 days of harvest.

Application of Furadan to soil causes microorganisms that degrade Furadan to increase in number. This results in faster breakdown of the chemical in subsequent years. Furadan may be of limited or little use in some bogs where this insecticide was applied in previous years. The problem exists in some cranberry bogs that have histories of Furadan use.

Adult weevils may be controlled by sprays of Orthene. Apply 1.3 lb. of Orthene 75S\* per acre **at night** when the weevils are most active. (Limit to one application per season.) It may be used in late April to early May to control overwintered adults. Be sure to note the 90-day preharvest interval. Do not apply to blooming cranberries.

Entomopathogenic nematodes may be applied in May or September to control root weevil larvae. Application through irrigation sprinklers has been more satisfactory than by sprayers. Follow the nematode producer's instructions as to rates and methods.

Root weevils usually are not a problem in water-harvested bogs. If they do occur there, hold the floodwater 4–7 days after harvest. Flooding for this purpose will be more effective at that time than in mid-winter.

## CUTWORMS AND OTHER CATERPILLARS

Apply 3 pints of Lorsban 4E per acre as a foliar spray when the caterpillars are present in damaging numbers.

Use at least 100 gallons of water per acre when using ground equipment. Do not apply if bogs are flooded. Do not make more than two applications per year or apply within 60 days of harvest. Do not apply when cranberries are in bloom.

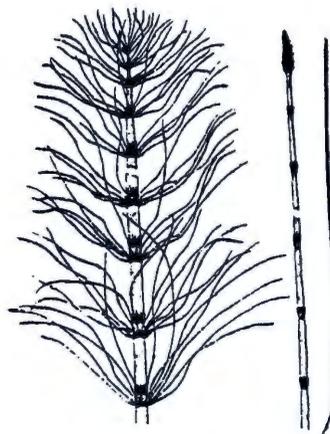
## FROST AND SCALD CONTROL

**Frost.** Sprinkle during every frost period after buds have started to swell. During severe freezes, occasional sprinkling may not give complete protection. Coating with ice will help prevent desiccation. Do not turn off sprinklers until ice on the vines has melted.

**Scald.** Sprinkle during periods of high temperatures and low relative humidity. Turn sprinklers on before the temperature reaches 80° to 85°F.

\*These pests are not on the label. However this use is legal when label directions and precautions are followed.

Horsetail



# INSECT AND DISEASE CONTROL IN CRANBERRIES

Time of application	Insect or disease	Materials*	Amt. formulation Per acre** Use 300 gal./acre	Tolerance in ppm	††PHI	Remarks
Late dormant stage (March 1 to 15)	Stem and leaf blight	Bordeaux mixture 8-8-100	24 lbs.	Exempt	None	<b>Do not</b> use Bordeaux mixture in combination with any insecticide.
When buds break dormancy	Stem and leaf blight	Use any fungicide and its rate listed for the late dormant stage.				
	Cottonball	†Funginex	1.5 pts.	0.1	60 days	Repeat Funginex application in 10-14 days. <b>Do not</b> combine Funginex with surfactants. <b>Do not</b> let spray mixture stand in tank overnight. Chemigation is <b>NOT</b> recommended. <b>Do not</b> apply Funginex more than 4 times per season.
Rough neck (approx. May 1)	Rose bloom****	Bordeaux mixtures 8-8-100 Kocide 101	24 lbs. 8 lbs.	Exempt Exempt	None None	See Rose Bloom Control text.
Late April to early May	Black vine weevil	Entomopathogenic nematodes (BioSafe-N)		Exempt		Apply in accordance with manufacturer's directions when soil temperatures exceed 53°F.
	Phytophthora root rot	Ridomil 5G, or Ridomil 2E	20-35 lbs. 4-7 pts.	4 4	45 days 45 days	See phytophthora root rot control on other side.
Late hook (about May 15 ± 5 days). Avoid applica- tion of insecticides after first blossoms appear. Killing bee pollinators will reduce yields.	Rose bloom,**** stem and leaf blight	Use any fungicide and its rate listed for the late dormant stage.				<b>Do not</b> use Bordeaux mixture in combination with any insecticide. Apply as soon as worms are found in vines or tips.
	Fireworm, Tip- worm, and Fruitworm	Diazinon 4 lb./gal. EC, or	4 pts.	0.5	7 days	
		Diazinon 50WP, or	4 lbs.	0.5	7 days	
		Guthion 50WP, or	2 lbs.	2	21 days	Lorsban may only be applied two times per year.
		Guthion 2EC, or	4 pts.	2	14 days	
		Lorsban 4 lbs./gal. EC, or	3 pts.	1	60 days	
		†Malathion 5 lbs./gal. or	1.5 pts.	8	3 days	Orthene may be applied once per season.
†Malathion 8 lbs./gal. or Orthene 75s, or	1 pt. 1.3 lbs.	8 0.5	3 days 90 days			
	Sevin XLR Plus	6 pts.	10	1 day	Do not apply Sevin XLR Plus during bloom.	
Early Bloom	Cottonball	†Funginex	1.5 pts.	0.1	60 days	See remarks for Funginex above.

(Continued)

Time of application	Insect or disease	Materials*	Amt. formulation Per acre** Use 300 gal./acre	Tolerance in ppm	††PHI	Remarks	
Late bloom (when 80% of blossoms have dropped). To protect bee pollinators <b>do not</b> apply insecticide during blossoming. Remove bees before spraying with insecticides.	Fireworm	Use same insecticide control as in the late hook stage, <b>except do not apply Orthene if it was used at late hook stage.</b>				Use insecticides only when necessary. Apply as soon as second generation larvae are seen (about July 5 ± 5 days).	
	Fruitworm (Application for these pests also controls tipworms)				See twig Blight Control text on other side.		
	Fruit rot, Storage rot Twig blight*** (Lophodermium)		Agronil 500, or	6-10 pts.	5	50 days	These fungicides help to reduce fruit rot plus protect vines from twig blight. Repeat at 10- to 14-day intervals. Do <i>not</i> apply Bravo products more than three times per season. <b>Do not</b> combine Bravo with surfactants or Dipel. Do not apply ferbam later than 28 days after midbloom.†††
			Bravo 720, or	4-7 pts.	5	50 days	
			Bravo 90DG, or	3.5-5.75 lbs.	5	50 days	
			Carbamate (ferbam) 76WDG, or	6 lbs.	7	See remarks†††	
			Kocide 101, or	8 lbs.	Exempt	None	
			Kocide 606, or	10 pts.	Exempt	None	
Mancozeb 80WP, or	3-6 lbs.	7	30 days†††	<b>Do not</b> combine Bravo with surfactants or Dipel. Do not apply ferbam later than 28 days after midbloom.†††			
Mancozeb 4DF, or	2.5-4.8 qts.	7	30 days†††				
Mancozeb DF	3-6 lbs.	7	30 days†††				
	Black vine weevil****	Orthene 75S (night application will provide best control of adult weevils)	1.3 lbs.	0.5	90 days	<b>Do not</b> use Kocide in combination with any insecticide. Do not use Orthene at late bloom if you used it at late hook stage. Orthene may be used only once per season.	
July 1-15	Fruit rot, Storage rot Twig blight (Lophodermium)	Any fungicide and its rate listed for late bloom.					
(Approximately) July 1-7	Cranberry girdler	†Diazinon 14G  Entomopathogenic nematodes (BioSafe-N) Best to apply nematodes no earlier than 14 days following peak moth flight. Follow manufacturer's recommendations for application timing and irrigation requirements.	3 lbs. active ingredient (21 lbs. of 14% G)	0.5  Exempt	7 days	Apply to bogs about July 1-7 and again 14 days later. Do not discharge water from bogs within 7 days of application. <b>If pheromone traps are used, apply diazinon at peak flight of moths, and again 2 weeks later if there was a season's accumulative total of 25 moths per trap before peak flight. Otherwise, apply when season's accumulative total reaches 25 moths per trap.</b>	

(continued)

## INSECT AND DISEASE CONTROL IN CRANBERRIES (Continued)

Time of application	Insect or disease	Materials*	Amt. formulation Per acre** Use 300 gal./acre	Tolerance in ppm	††PHI	Remarks
July 25 to August 10	Fruit rot, Storage rot Twig blight (Lophodermium)	Any fungicide and its rate listed for late bloom <b>except</b> Carbamate.				Insecticides may be combined with fungicides if insect control is necessary. It is <b>not</b> advisable to use more than one of each in the tank at any given time. Check the label of each product to be combined for special mixing instructions. Use diazinon, malathion, or parathion if scale insects are a problem. Spray for fireworm only if third generation larvae are seen.
	Fireworm, Fruitworm, Lecanium scale	Use any insecticide, except Orthene, and its rate listed for the late hook stage. Use Lorsban only if it will be applied at least 60 days before harvest.				
	Phytophthora root rot	See Ridomil under late April to early May.				
∞ August 20 to 25	Fruit rot, Storage rot Twig blight (Lophodermium)	Any fungicide and its rate listed for late bloom <b>except</b> Bravo, and Carbamate.				Helpful for control of storage rots and twig blight if severe.
Mid- to late September	Black vine weevil	Entomopathogenic nematodes (BioSafe-N)	See label for instructions	Exempt		Apply in accordance with manufacturer's directions regarding irrigation requirements and when soil temperatures exceed 53°F. Apply a single application in spring or fall when larvae are present.
October	See remarks on flood-water control for weevils under root weevil section.					

\*Pesticides are listed in alphabetical order and not necessarily in order of effectiveness.

\*\*Do not exceed the amount indicated on product label.

\*\*\*If twig blight is present, Bravo or Mancozeb are recommended over other products.

\*\*\*\*This pest is not on the label. However, this use is legal when label directions and precautions are followed.

†Washington State SLN Registration. A copy of the state label must be in the grower's possession when applying this pesticide.

††PHI stands for preharvest interval or the minimum number of days from last application to harvest.

Abbreviations: WP-wettable powder; EC-emulsifiable concentrate; G-granules; F-flowable; S-soluble powder; DG-dispersible granules; WDG-water dispersible granules.

‡‡‡Certain processors are requesting that growers voluntarily maintain a 60-day preharvest interval for EBDC fungicides (for example, mancozeb and ferbam).

†Reregistration of malathion for this use will not occur. Growers may use up existing stocks if cranberries are on the label.

# Weed Control

Herbicide use in cranberry bogs is often more difficult than in other crops and cropping situations. The root system of cranberries consists of a mass of fine, fibrous roots. Most of the roots are in the upper 4 to 6 inches of soil, making herbicide injury more likely. Furthermore, cranberry bogs are acidic and usually high in organic matter; both conditions affect herbicide action. If higher herbicide rates are used to gain weed control, chances for cranberry injury are increased. Under most conditions, the chemical weed control practices outlined have proved to be effective and selective to cranberries when carefully used according to directions. Soil pH management can be an important tool in controlling weeds. Soil pH's above 5.0 will encourage some species of weeds. Gradually lowering pH with elemental sulfur when combined with a good herbicide program is an effective means to control some leguminous weeds.

## SWAB TREATMENTS

### Tall weeds on bogs.

- Glyphosate (Roundup)—Use solutions as directed by product label, swabbed on weeds extending at least 6 inches above cranberry vines.
- Do not allow solution to drip or touch cranberry vines. Apply after fruit set and no later than 30 days before harvest (July–August). Repeat treatment may be necessary; wipe in both directions to improve results; use a recommended dye to observe coverage patterns. Do not use, mix, or store in galvanized pipe or container. Rainfall or irrigation occurring within 6 hours after application may reduce effectiveness. Poor growing conditions such as stress, disease or insect damage also may reduce effectiveness. Adding 2,4-D to Roundup may improve control against some broadleaf weeds. Do not mix these two products together without diluting one first, or they may solidify. Weed control also may be enhanced by adding 6 Tbsp. of ammonium sulfate and 2 Tbsp. of a nonionic surfactant to 1 gal. of Roundup mixture.

Roundup also may be applied as a stump treatment or injection and frill application. Use for woody brush control in and around cranberry bogs. Do not make applications within the 30-day period prior to harvest.

- 2,4-D amine—10% to 33% solution swabbed on weeds extending above cranberry vines.

The only 2,4-D amine formulation registered for this use is sold under the trade name Weedar 64. Special local

need registration is No. WA800081. The label must be in the grower's possession at the time of application.

Do not allow the solution to drip or touch cranberry vines. Apply only once per year. 2,4-D is volatile. Application during hot weather will injure vines and flowers.

- Sulfosate (Touchdown)—25% solution for wick wipers. Can only be used on nonbearing vines. Apply to target weeds, avoiding contact with vines.

## NEW PLANTING

Preplant weed eradication of perennial weeds prior to planting is critical. Fumigation or multiple spraying of new and established weeds with Roundup in the summer prior to planting a new bog or renovating a weedy bog is highly recommended.

- Norflurazon (Evital) at 1-2.5 lb active ingredient per A (20-50 lb product). Use lower rates on 'Stevens,' 'Crowley,' or 'Pilgrim' varieties on sandy soils. Injury may occur in areas where water puddles.
- Napropamide (Devrinol) at 5 lb active ingredient per A (50 lb product). Use only on bogs established at least 1 year. Use split applications of lower rates on sandy soils.

### *Use granular formulations.*

Apply to newly planted bogs after weed emergence.

- Sethoxydim (Poast) at 0.5% solution (4 tsp & 4 tsp crop oil/gal water). Do not apply within 1 year of harvest.
- Fluazifop (Fusilade) at 1.2% solution (3 Tbsp & 3 Tbsp crop oil or 1 Tbsp nonionic surfactant/gal water). Do not apply within 1 year of harvest.

Apply to actively growing grasses listed on label at the 4- to 5-leaf stage (6 to 12 inches tall).

Apply to obtain thorough coverage but not to run-off. Repeat treatment if necessary as often as three times (June, July, and August).

Erratic results often occur when grasses are stressed from lack of vigor, drought, high temperature, low fertility, grass stage of growth, and unknown environmental factors. Plants that are not true grasses, fescues and annual bluegrasses resist treatment.

# WEED CONTROL IN CRANBERRIES

Time of application	Weed*	Materials**	Amt. formulation per acre	Tolerance in ppm	PHI	Remarks
Dormant stage November–December	Cats-ear* or false dandelion, spikerush*, oniongrass*, cottontop*, rush*, broadleaf weeds	19.2% ae G 2,4-D low volatile ester	20 lbs.	0.5	—	Apply 2,4-D soon after weed emergence, while cranberries are completely dormant and dry. Use granular formulation. Do not use products with significant amounts of fine powder. Use only 2,4-D products registered for cranberries. 2,4-D provides only limited residual weed control.
February–late April	Birdsfoot trefoil (lotus*), buttercup*	Devrinol, 10% G Devrinol 50DF (Napropamide)	75–150 lbs. 8–18 lbs.	0.1 0.1	—	Apply Devrinol before start of spring growth to dry vines. Rain or sprinkler irrigation of at least 1/4 inch after application is essential for weed control. A split application (75 lbs. late Feb. and 50 lbs. mid-April) will provide better lotus and general overall weed control than a single application in February–March. Better control is achieved in bogs where soil pH is less than 5.0. Combining Devrinol with one or two applications of Casoron (50 lbs.) will provide additional lotus suppression. Do not exceed 150 lbs/A of Devrinol per year. Use lower rate on sand beds. Devrinol may lose effectiveness if repeatedly used at high rates in the same field for several years. For control of severe buttercup, use a single large application of Devrinol (100–150 lbs.) in January, combined with a split Casoron application in early March and April.

(Continued)

Time of application	Weed*	Materials**	Amt. formulation per acre	Tolerance in ppm	PHI	Remarks
February-late April (continued)	Rice cutgrass, povertygrass*, smokegrass, barnyard grass, needlegrass, spikerush, nutsedge	Evital, 5% G (norflurazon)	50-160 lbs.	0.1	—	Do not apply after bud opening or more than once per year. Use lower rates on 'Stevens,' 'Crowley,' or 'Pilgrim' varieties, on sandy bogs, or on bogs having weak vines.
	Annual broadleaf weeds, purple aster, loosestrife, rush, sedge, grass, Field horsetail, silverleaf.*	Casoron/Norosac, 4% G (dichlobenil)	40-100 lbs.	0.15	—	Better weed control can be achieved by using two equal applications in the spring using 50 lbs. each time 3 to 6 weeks after first application. Do not apply at or after popcorn stage. Do not exceed 100 lbs of product per year on producing bogs. Higher rates will reduce yields. Avoid overapplication, which may result from overlapping during treatment period.
	Multiple species—severe infestation	Casoron/Norosac 4% G (dichlobenil) plus 2,4-D 19.2% ae G	30-50 lbs.	0.15	—	Better control of hard-to-kill weeds may be obtained when these two herbicides are used in combination.
5-15 lbs.			0.5	—	Use granular formulations of these herbicides and follow all precautions and restrictions as given for each herbicide when used alone (see above). Do not apply at or beyond popcorn stage. May be used as a split application in late February and early to mid-April for more effective weed control.	

\*Weeds not on product label: some suggested uses of pesticides in this publication are for weeds not listed on the label. These are indicated by the symbol\*. Such uses comply with the federal law (FIFRA) which says a use is consistent with label instructions provided the crop or site is on the label and directions concerning rates and interval before harvest are followed.

\*\*Do not exceed the amount indicated on product label. ae means acid equivalent.

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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