

<b>Dormant and Delayed Dormant</b>			
<b>Pest</b>	<b>Spray Material, Rate/A (pre-harvest interval)</b>	<b>Cultural Practices and Scouting Notes</b>	<b>Comments</b>
Mites	Kelthane 35 WP, 1-1.5 lb (1)		
<b>Veraison to harvest</b>			
Powdery mildew	Sulfur 95 MFW , 2.5 oz (0) Nova 40WP, 1.5 - 2.5 oz (14) Rubigan 1 EC, 3 oz (30)		<b>Sulfur</b> may cause injury of certain grape cultivars, especially if temperatures exceed 85½F. Do not apply more than 1.5 lbs of <b>Nova</b> per acre per season. Do not apply more than 6 fl. oz. of <b>Rubigan</b> EC per acre per application or more than 19 fl. oz. per season. Read the label carefully.
Botrytis bunch rot	same as bloom section		
Downy mildew	Captan 50WP, 1.5 lb (0) Fixed copper (consult label for use instructions)		Consult the label for harvest restrictions.
Black rot	As berries reach full size and sugar content starts to increase, they become resistant to infection by the black rot fungus. In general, berries are no longer susceptible to black rot after veraison (6-8% sugar content)		

‡ Root form controlled by using rootstocks derived from American grapes.

† Where brand names for chemicals are used, it is for the reader's information. Not endorsement is implied, nor is discrimination intended against products with similar ingredients. Please consult pesticide product labels for rates, application instructions and safety.

\* **Restricted use material; pesticide applicator license required.**

## Weed Management

The primary goal of weed management is to optimize yields by minimizing competition between the weeds and the crop. Weeds reduce yields by competing with the crop for water, light, and nutrients. Weeds also harbor insects and diseases and encourage vertebrate pests. Timely cultivation, wise use of herbicides, and never permitting weeds to go to seed are integral parts of a good weed management system. Many of the weeds found in these fields are difficult-to-control perennial weeds that are not common in annual crop culture. New plantings usually have fewer perennial weed problems than older plantings. Annual and biennial weeds can also exist in these fields. Fields should be scouted at least twice a year (spring and fall) to determine specific weed problems. The selection of a weed management tool should be based on specific weeds present in each field. Several herbicides are labeled for use in this crop. A list of herbicides and their recommended uses is presented in Table 46 below.

Herbicides can be broadcast or applied as a directed spray to the base of the crop. With a band treatment, only 1 to 2 feet on either side of the rows is treated. The area between the crop rows is usually maintained with a mowed cover of sod, clover, weeds, or a combination of these. This cover is used primarily for erosion control and to improve trafficability in the field. With banding, less herbicide is needed in each acre. For example, a 3 foot band (1.5 feet on either side of the row) where rows are spaced 9 feet apart will require only one third the amount of herbicide normally required for a broadcast treatment.

Cultivation and mulching are sometimes used as weed management tools. All cultivations should be timely and shallow to minimize crop root injury, to minimize loss of soil moisture, and to avoid repositioning new weed seeds to the soil surface. Mulches that are free of weed seeds and placed thickly enough can be very effective at reducing or eliminating most annual weeds from the crop row. They are seldom effective on perennial weeds. If mulches are used in combination with herbicides, use the lowest recommended herbicide rate to avoid crop injury.

Table 46. Weed management in grapes during the planting year and in established vineyards<sup>†</sup>.

TRANSPLANT YEAR			
Weed Problem	Herbicide	Rate/Acre	Comments and Limitations
<b>PREEMERGENCE WEED CONTROL</b>			
Annual grasses and small seeded broadleaf weeds	(napropamide) Devrinol 50DF	8 lb	Apply after transplanting to weed-free soil. Devrinol must be activated within 24 hrs by cultivation or enough water by irrigation or rainfall to wet the soil to a depth of 2 to 4 inches. The full rate may not be necessary at transplanting.
	(oryzalin) Surflan 4AS	2 to 4 qt	Do not apply until soil has settled around the plants and no cracks are present. Irrigation or 1 inch of rain is needed within 21 days of application. Shallow cultivation will improve control. Do not make more than one application per season.
	(pendimethalin) Prowl 4EC	2 to 4 qt	Apply to weed-free soil directly beneath vines. Do not apply if buds have started to swell. For non-bearing vines only.
Broadleaf weeds, some grasses, and some perennial weeds	(dichlobenil) Casoron 4G	150 lb	Apply in late fall or winter for best results. Incorporate lightly for best results. The soil must be settled and the plants recovered from transplant shock before application. May cause injury in young plants or where vigor is not excellent.
<b>POSTEMERGENCE WEED CONTROL</b>			
Emerged annual and most perennial grasses	(fluazifop) Fusilade DX	16 to 24 oz	See label for best times to treat specific weeds. Will not control broadleaf weeds or sedges. Do not apply to crops to be harvested within 1 year of application. Do not apply if rainfall is expected within 1 hour or if grasses are under drought stress. Must be used with a crop oil concentrate or non-ionic surfactant.
	(sethoxydim) Poast	1 to 2.5 pt	See label for best times to treat specific weeds. Will not control broadleaf weeds or sedges. Do not apply to grasses under stress (e.g., drought). Crop oil concentrate must be added to the spray tank. Do not cultivate 5 days before or 7 days after application. Do not apply more than 5 pints per acre per season.
Emerged annual weeds and suppression of perennial weeds.	(pelargonic acid) Scythe	3-10% solution	Contact material for burn down only. See Scythe comments in Strawberry section. See label for complete instructions.
Emerged annual grasses and broadleaf weeds. Suppression of emerged perennial weeds	(paraquat) *Gramoxone Max	1.7 to 2.7 pt	Contact herbicide. Use with a non-ionic surfactant. Apply as a coarse directed spray on a warm calm day to wet the weeds. Avoid application to foliage or green shoots. Use of a shield is highly recommended.
	(glufosinate) Rely	4 to 6 qt	Contact herbicide. Apply in at least 20 gallons of water per acre at no more than 30 psi. Apply as a coarse directed spray on a calm day to wet the weed foliage or green shoots. For spot sprays use 1.5 ounces per gallon of water. May also be used for sucker control. See label.

Weed Problem	Herbicide	Rate/Acre	Comments and Limitations
<b>POSTEMERGENCE WEED CONTROL</b>			
Emerged annual and perennial weeds	(sulfosate) Touchdown	1 to 5 pt	NON-BEARING USE ONLY. Apply to actively growing weeds during site preparation prior to planting and no later than 1 year before harvest. Apply with a wiper or a shielded/directed spray. Do not allow the spray, spray drift, or mist to contact green foliage or green bark on the trunk, suckers, open wounds, or other green parts of the vine. Consult the label for rates for specific weeds and other precautions. Use with a surfactant or wetting agent.
<b>ESTABLISHED PLANTINGS</b>			
<b>PREEMERGENCE WEED CONTROL</b>			
Annual grasses and small seeded broadleaf weeds	(napropamide) Devrinol 50DF	8 lb	Apply in the early spring before seedling weeds emerge. Devrinol must be activated within 24 hours by shallow cultivation or with enough rainfall or irrigation to wet the soil to a depth of 2 to 4 inches.
	(oryzalin) Surflan 4AS	2 to 6 qt	Apply to weed-free soil in the spring. Irrigation or 1 inch of rainfall is needed within 21 days of application. Do not make more than 1 application per year.
	(norflurazon) Solicam 80DF	1.25 to 5 lb	Apply in early spring when crop is dormant to clean and weed-free soil. Do not apply after budbreak. Do not apply to coarse soils. Do not use on nursery stock. <b>VINES MUST BE TWO YEARS OLD BEFORE APPLICATION.</b>
	(pronamide) *Kerb 50WP	2 to 8 lb	Apply in early spring for preemergence control of weeds or as a directed fall application after harvest but prior to leaf drop and soil freeze-up. Do not apply to vines less than 1 year old.
NOTE: For broad spectrum preemergence weed control, consider applying one of the above four "grass" herbicides (napropamide, oryzalin, norflurazon, or pronamide) in addition to one of the following "broadleaf" herbicides (simazine, diuron, oxyfluorfen, or dichlobenil). CHECK VINEYARD AGE RESTRICTION BEFORE USING ANY HERBICIDE.			
Broadleaf weeds, some grasses, and some perennial weeds	(simazine) Caliber 90 Princep 4L	4.4 lb 4 qt	VINEYARD MUST BE ESTABLISHED AT LEAST 3 YEARS. Do not replant to other crops for 2 years. Apply from late winter to early spring. Do not apply on gravelly, sandy, or loamy sand soils or injury may result.
	(diuron) Karmex 80 DF	2 to 6 lb	VINEYARD MUST BE ESTABLISHED AT LEAST 3 YEARS. Apply in Spring just prior to germination of annual weeds.
	(dichlobenil) Casoron 4G	100 to 150 lb	Use at temperatures below 40½F. May cause injury if plants are not well established. Apply in late fall or winter for best results. Effective on many perennial weeds.
	(oxyfluorfen) Goal 1.6E	2.5 to 10 pt	VINEYARD MUST BE ESTABLISHED AT LEAST 3 YEARS. Use a minimum of 40 gallons of water per acre, directed to the soil at the base of vines. Soil surface should be smooth and free of trash. Apply only to dormant vines. Do not apply to vines that are not staked or trellised.

Table 46 continued. Weed management in grapes during the planting year and in established vineyards†.

ESTABLISHED PLANTINGS			
Weed Problem	Herbicide	Rate/Acre	Comments and Limitations
POSTEMERGENCE WEED CONTROL			
Emerged annual grasses and broadleaf weeds. Suppression of emerged perennial weeds.	(paraquat) *Gramoxone	Max 1.7 to 2.7 pt	Contact herbicide. Use with a non-ionic surfactant. Apply as a coarse directed spray on a warm calm day to wet the weeds. Avoid application to foliage or green shoots. Use of a shield is highly recommended.
	(glufosinate) Rely	4 to 6 qt	Contact herbicide. Apply in at least 20 gallons of water per acre at no more than 30 psi. Apply as a coarse directed spray on a calm day to wet the weed foliage or green shoots. For spot sprays use 1.5 ounces per gallon of water. May also be used for sucker control. See label.
Emerged annual and perennial broadleaf weeds and grasses	(glyphosate) Roundup Ultra	1 to 5 qt	Do not allow spray, drift, or mist, to contact green bark, suckers, or vines. Suckers within spray zone should be removed before application to reduce risk of crop damage. Use of a shield is highly recommended. Applications must be made prior to the end of bloom stage unless a wick applicator or shielded sprayer is used. Do not apply within 14 days before harvest.
Emerged annual weeds and suppression of perennial weeds.	(pelargonic acid) Scythe	3-10% solution	Contact material for burn down only. See Scythe comments in Strawberry section. See label for complete instructions.
Emerged annual and most perennial grasses	(sethoxydim) Poast	1 to 2.5 pt	Effective on actively growing grasses. Do not apply to grasses under stress (e.g., drought). Crop oil concentrate must be added to the tank. Do not cultivate 5 days before or 7 days after application. Do not apply within 50 days before harvest or exceed 5 pints per acre per year.

*\*Restricted use pesticide; pesticide applicator license required.*