

Weed Management in Grape¹

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Proper weed management is important for a healthy vineyard. Grapevines and weeds compete for water, nutrients, and light. Weeds also serve as hosts for insects and nematodes.

Grape growers use a system of turf and weed-free strips under the vines (Figure 1). A weed-free zone under the vines reduces the impact of weeds on vine growth. The weed-free strips are 3–4 ft. wide. Turf strips are mowed or growth is chemically controlled on a regular basis. The turf minimizes erosion and provides an area for machinery and picking crews.



Figure 1. Weed-free strip under grapevines

Credits: Peter J. Dittmar

Nonchemical weed management practices are part of a complete weed management program. Cultivation was once a common practice for weed management in grapes. This management practice is not as widely used now because of root pruning, erosion, and reduced radiant heat in the spring. Reduce the spread of weed species by controlling the plants before seeds are produced and by cleaning mowing equipment. Mulches provide weed control but can be cost prohibitive.

Chemical Control

Herbicides available for weed control in grapes are included in Tables 1 and 2. Table 1 lists herbicides that control weeds before they emerge (preemergence). Table 2 lists herbicides that control weeds after they emerge (postemergence). Because soil types in Florida vary, consult the labels for application rate restrictions based on soil type. Bearing vines are grapevines that are currently producing fruit. Nonbearing vines are grapevines that will not produce fruit for a year after application. The tables include preharvest intervals (PHI) and restricted-entry intervals (REI).

Practices for improving weed control with herbicides are as follows:

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1. **Herbicide selection.** Preemergence herbicides control the weeds before they emerge from the seed or soil surface. Postemergence herbicides control weeds that have emerged through the soil surface.
2. **Optimal timing.** Preemergence herbicides should be applied in the early spring or fall before annual weeds emerge. Postemergence herbicide efficacy decreases as weeds grow. Consult the label for the correct size of weed to control.
3. **Sufficient coverage.** Herbicide labels require certain gallons per acre (GPA) or nozzle types for proper coverage. Before spraying, check that all nozzles have a correct spray pattern and correct output.
4. **Adequate activation.** Preemergence herbicides require rainfall or irrigation to move the herbicide into the soil profile where the weed seeds are present. Postemergence herbicides require a nonionic surfactant, crop oil concentrate, or methylated seed oil for increased herbicide uptake.

Herbicide Resistance

Herbicide-resistant weeds are a continuous and growing concern for farmers. Methods for reducing the chances of herbicide resistance include the following:

1. **Rotate herbicide's mode of action.** Each herbicide's mode of action (MOA) is assigned a numerical group. Tables 1 and 2 list the MOA for each herbicide. Rotate between modes of action/numerical groups.
2. **Include multiple MOA.** Many herbicides allow for tank mixing herbicides. It is often suggested that preemergence herbicides be tank mixed with a postemergence herbicide. This method controls weeds that will emerge as well as weeds that have already emerged.
3. **Managing known resistance.** If an area of the field is known to have a resistant weed species, use mechanical weed removal to prevent the weed from producing seeds or other methods of propagation. In addition, try to quarantine and eradicate the population. Please also contact your county Extension agent to have the weed resistance confirmed and documented.

Table 1. Preemergence weed control in grape

Common name lb. a.i. / A	(Trade name) formulation amount of product / A	Weeds controlled
Dichlobenil , MOA 20 4–6 2.0–3.9	(Casoron®) 4G 100–150 lb. (Casoron®) 1.4 CS 1.4–2.8 gal.	Annual and some perennial weeds
<i>Remarks:</i> Bearing and nonbearing vines. Tank mix with postemergence herbicides for broader spectrum of weed control. Higher rates required for perennial weed control. Casoron® 1.4 CS should not be applied until 1 year after transplanting. Casoron® 4G should not be applied until 4 weeks after transplanting. Consult label for restrictions based on soil type. Casoron® 4G REI 12 hours. Casoron® 1.4 CS REI 24 hours.		
Diuron , MOA 7 1.6–4.0	(Diuron, Karmex®, or Karmex®XP) 80 WDG 2–5 lb. (Direx®) 4 L 1.6–4.0 qt.	Annual broadleaf and grass weeds
<i>Remarks:</i> Apply to established vineyards at least 3 years old. Increased risk of injury if soils low in clay or organic matter receive 1 in. of rainfall or irrigation after treatment. Do not make more than two applications a year and allow 90 days between applications. No more than 4 lb. a.i./A (4 qt.) in a single application or 8 lb. a.i./A per year. Direct spray solution to the base of the vine to avoid contact with foliage and green bark. REI 12 hours.		
Flumioxazin , MOA 14 0.19–0.38	(Chateau®) 51 WDG 6–12 oz.	Broadleaf and annual grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Maximum of 6 oz./A per application if soil has over 80% sand plus gravel content. Tank mix with burndown herbicides. Do not apply to grapes less than 2 years old unless trellised at least 3 ft. from soil surface or protected. No sequential treatment within 30 days of the previous application. Do not apply to grapes that are not trellised or staked unless they are free standing. PHI 60 days. REI 12 hours.		
Isoxaben , MOA 12 0.5–1.0	(Gallery® or Gallery® T&V) 75 DF 0.66–1.33 lb.	Certain broadleaf weeds
<i>Remarks:</i> Nonbearing vines. Direct spray solution to the base of the vine. A rainfall or irrigation event of 0.5 in. or more within 21 days after application is required for activation. Apply after irrigation and/or rainfall has settled soil around roots of newly transplanted vines. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. REI 12 hours.		
Isoxaben , MOA 12+ Oryzalin , MOA 3 2.0–4.0 + 0.5–1	(Snapshot®) 2.5 TG 100–200 lb.	Certain broadleaf and annual grass weeds
<i>Remarks:</i> Nonbearing vines. Apply after irrigation and/or rainfall has settled soil around roots of newly transplanted vines. Apply with a drop or rotary spreader. Requires 0.5 in. or more of rainfall or irrigation within 3 days of application for activation. Do not exceed 600 lb. of product/A per year. Allow 60 days between applications. REI 12 hours.		
Napropamide , MOA 15 4	(Devrinol®) 50 DF 8 lb. (Devrinol®) 10 G 40 lb.	Small-seed broadleaf and annual grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Can be applied to newly transplanted vines. Apply in the fall or early spring before weeds emerge. Direct spray solution to the base of the vine to minimize contact with foliage and fruit. Cultivate or irrigate to a depth of 2–4 in. within 24 hours of application. PHI 35 days. REI 24 hours.		
Norflurazon , MOA 12 0.98–2.95	(Sollicam®) 80 WDG 1.25 lb.	Small-seed broadleaf and annual grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Do not apply before 24 months after planting. Temporary loss of pigment (whitening) in leaf veins may occur with normal use if applied within 3 months of bud break. Rainfall or irrigation is required within 4 weeks of application. Consult label for restrictions based on soil type. Consult label for postemergence herbicides that can be tank mixed to broaden spectrum of weed control. PHI 60 days. REI 12 hours.		
Oryzalin , MOA 3 2–6	(Oryzalin, Surflan®) 4 AS 2–6 qt.	Certain annual broadleaf and grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Apply as a sequential treatment with 2.5 months between applications. Do not exceed 12 lb. a.i./A per year. Irrigation or a rain event of 0.5–1 in. must occur within 1 week of an application. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. REI 24 hours.		
Oxyfluorfen , MOA 14 1.25–1.5	(Goal® 2 XL, Galigan®) 2 EC 5–8 pt. (Goaltender®) 4 E 2.5–4 pt.	Broadleaf weeds

Common name lb. a.i. / A	(Trade name) formulation amount of product / A	Weeds controlled
<p><i>Remarks:</i> Bearing and nonbearing vines. Do not apply to vines less than 3 years old unless on a trellis wire a minimum of 3 ft. above the soil surface. Apply after dormancy is initiated and before bud break. Broadcast application is 1.25–1.5 lb. a.i./A and banded treatment is 1.25–2 lb. a.i./A. Do not apply more than 1.5 lb. a.i./A per year in a broadcast application and 2 lb. a.i./A per year in banded applications. Direct spray solution to the base of the vine using a shielded sprayer. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. REI 24 hours.</p>		
<p>Pendimethalin, MOA 3 3.0–6.0</p>	<p>(Prowl[®]H₂O) 3.8 3.2–6.3 qt. (Prowl[®], Pendulum[®]) 3.3 EC 2.4–4.8 qt.</p>	<p>Broadleaf and grass weeds</p>
<p><i>Remarks:</i> Nonbearing vines. Direct spray solution to the base of the plants. Apply during the dormant period. Apply as a single application or sequential application with 30 days between applications. After application, 1–2 in. of rainfall or irrigation are required for activation. For newly transplanted vines, apply after a rain or irrigation event settles soil around the roots. PHI 90 days. REI 24 hours.</p>		
<p>Pronamide, MOA 3 1–2</p>	<p>(Kerb[®]) 50 W 2–4 lb.</p>	<p>Certain broadleaf and grass weeds</p>
<p><i>Remarks:</i> Bearing and nonbearing vines. Do not apply until 1 year after fall transplanting or 6 months after spring transplanting. Direct spray solution to the base of the vine after fruit harvest. Apply in the fall when temperatures are below 55°F but before the soil freezes. Do not apply more than 4 lb. a.i./A or one application per year. REI 24 hours.</p>		
<p>Rimsulfuron, MOA 2 0.03–0.06</p>	<p>(Matrix[®] FNV, Matrix[®] SG) 25 WG 2–4 oz.</p>	<p>Certain broadleaf weeds and annual grasses</p>
<p><i>Remarks:</i> Bearing and nonbearing vines. Apply after plants are 1 year old. Soil should be moist, and 0.5 in. of rainfall or irrigation is required within 2 weeks of application. Broadcast application is limited to one application per year at 4 oz./A. Banded application may be applied twice a year with 30 days between applications, not to exceed 4 oz./A per year. Direct spray solution to the base of the vine, avoiding contact with foliage and fruit (except undesirable suckers). Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. PHI 14 days. REI 4 hours.</p>		
<p>Simazine, MOA 5 2–4</p>	<p>(Princep[®]) 90 WDG 2.2–4.4 lb. (Princep[®]) 4 L 2–4 qt.</p>	<p>Annual broadleaf and grass weeds</p>
<p><i>Remarks:</i> Bearing and nonbearing vines. Do not apply in vineyards less than 3 years old. Do not apply more than 4 lb. a.i./A per calendar year. Apply half the maximum in the spring before bud break and half in the fall. Irrigation or rainfall is required after application for activation. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. REI 48 hours.</p>		
<p>Trifluralin, MOA 3 0.5–2</p>	<p>(Triflurex[®], Treflan[®], Trust[®]) 4 EC 1–4 pt. (Treflan[®], Trust[®]) 10 G 5–20 lb.</p>	<p>Annual broadleaf and grass weeds</p>
<p><i>Remarks:</i> Bearing and nonbearing vines. Apply 0.5–1.5 lb. a.i./A for newly transplanted vines after soil has settled. Apply 1–2 lb. a.i./A for established vines. Within 3 days of application, 0.5–2 in. of rainfall or irrigation are required for activation. Consult label for restrictions based on soil type. PHI 60 days. REI 12 hours.</p>		

Table 2. Postemergence weed control in grape

Common name lb. a.i. / A	(Trade name) formulation amount of product / A	Weeds controlled
Carfentrazone , MOA 14 0.015–0.031	(Aim [®]) 2 EC 1.0–2.0 fl. oz. (Aim [®]) 1.9 EW 1.0–2.0 fl. oz.	Broadleaf weeds
<i>Remarks:</i> Bearing and nonbearing vines. Consult label for appropriate rate based on weed species. Do not apply more than 0.124 lb. a.i./A in a growing season. Apply with hooded sprayer direct to the base of the vine to reduce contact with green stem tissue, desirable fruit, blooms, and foliage. Applications must be 14 days apart. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. For control of undesirable suckers at the base of the vine trunks, apply 0.031 lb. a.i./A; suckers must be young and not mature. For all types of applications, include a nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v PHI 3 days. REI 12 hours.		
Clethodim , MOA 1 0.14–0.25	(Arrow [®] , Select [®]) 2 EC 6–8 fl. oz. (Select Max [®]) 1 EC 9–16 fl. oz.	Annual and perennial grass weeds
<i>Remarks:</i> Nonbearing vines. Select Max [®] requires a nonionic surfactant, and other clethodim formulations require crop oil concentration. Direct spray to the base of the vines. REI 24 hours.		
Diquat , MOA 22 0.7–0.9	(Diquat) 2L 1.5–2.0 pt.	Broadleaf and grass weeds
<i>Remarks:</i> Nonbearing vines. Direct spray to the base of the vine to minimize contact with green stems and foliage. Include a nonionic surfactant at 0.06%–0.5%. REI 24 hours.		
Flumioxazin , MOA 14 0.19–0.38	(Chateau [®]) 51 WDG 6–12 oz.	Broadleaf and annual grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Maximum of 6 oz./A per application if soil has over 80% sand plus gravel content. Do not apply to grapes less than 2 years old unless trellised at least 3 ft. from soil surface or protected. Allow 30 days between applications. Include nonionic surfactant at 0.25% v/v or crop oil concentrate at 1 qt./A. Do not apply to grapes that are not trellised or staked unless they are free standing. PHI 60 days. REI 12 hours.		
Fluazifop , MOA 1 0.25–0.38	(Fusilade [®] DX) 2 EC 16–24 fl. oz.	Annual and perennial grass weeds
<i>Remarks:</i> Nonbearing vines. Direct spray solution to the base of the vines to minimize contact with leaves. Do not apply more than 72 fl. oz./A per season. Include nonionic surfactant at 0.25%–0.5% v/v or crop oil concentrate at 1% v/v. REI 12 hours.		
Glufosinate , MOA 10 1.0–1.5	(Rely [®] 200) 1.67 SL 77–115 fl. oz. (Rely [®] 280) 2.34 SL 48–82 fl. oz.	Broadleaf and grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Efficacy is reduced when temperatures are cool or the weeds are under drought stress. Direct spray solution to the base of the bush to minimize contact to leaf, flower, and fruit tissue. Do not apply to green or noncallused stems unless protected by nonporous wraps, grow tubes, or waxed containers. Do not apply more than 3 lb. a.i./A. Consult label for preemergence herbicides that can be tank mixed to broaden spectrum of weed control. PHI 14 days. REI 12 hours.		
Glyphosate , MOA 9 0.47–4.5	(Various formulations)	Broadleaf and grass weeds
<i>Remarks:</i> Glyphosate has various formulations. Consult individual labels for rates. Do not exceed 9.6 lb. a.i./A in a single season. Direct spray solution to the base of the vine to minimize contact with desirable vegetation. PHI 14 days. REI 4 hours.		
Oxyfluorfen , MOA 14 0.5–1.5	(Goal [®] 2 XL, Galigan [®]) 2 EC 2–8 pt. (Goaltender [®]) 4 E 1–4 pt.	Broadleaf weeds
<i>Remarks:</i> Bearing and nonbearing vines. Do not apply to vines less than 3 years old unless on a trellis wire a minimum of 3 ft. above the soil surface. Apply after dormancy is initiated and before bud break. Higher rates for weeds up to the six-leaf stage. Do not apply more than 1.5 lb. a.i./A per year in a broadcast application and 2 lb. a.i./A per year in banded applications. Direct spray solution to the base of the vine using a shielded sprayer. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. Include a nonionic surfactant at 0.25% v/v. REI 24 hours.		
Paraquat , MOA 22 0.63–1	(Gramoxone Inteon [®]) 2 SL 2.5–4 pt. (Firestorm [®]) 3 SL 1.7–2.7 pt.	Broadleaf and grass weeds

Common name lb. a.i. / A	(Trade name) formulation amount of product / A	Weeds controlled
<i>Remarks:</i> Bearing and nonbearing vines. Use a shield or wrap plants when spraying around young vines. Direct spray to the base of the vines to minimize drift to foliage, flowers, and fruits. Do not treat when sucker growth is no more than 8 in. long. Do not make more than five applications per year. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. PHI 21 days. REI 12 hours.		
Pelargonic Acid	(Scythe®) 3%–10% v/v	Broadleaf and grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Contact herbicide should be applied with a shielded sprayer and direct sprayed to the base of the vine to minimize contact with foliage and green bark. Consult label for control of suckers. Should be tank mixed with preemergence herbicide to broaden spectrum of weed control. REI 12 hours.		
Pyraflufen-ethyl , MOA 14 0.0013–0.0053	Venue® 1.0–4.0 fl. oz.	Broadleaf weeds
<i>Remarks:</i> Apply to bearing and nonbearing trees. Apply postharvest, dormant, or prebloom. Do not exceed 3 applications per season. Include REI 12 hours.		
Rimsulfuron , MOA 2 0.03–0.06	(Matrix®FNV, Matrix®SG) 25 WG 2–4 oz.	Certain broadleaf weeds and annual grasses
<i>Remarks:</i> Bearing and nonbearing vines. Apply only when plants are 1 year old. Broadcast application is limited to one application per year at 4 oz./A per year. Banded application may be applied twice a year with 30 days between applications, not to exceed 4 oz./A per year. Use a nonionic surfactant at 0.125% v/v. Direct spray solution to the base of the vine, avoiding contact with foliage and fruit (except undesirable suckers). Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. PHI 14 days. REI 4 hours.		
Sethoxydim , MOA 1 0.3–0.5	(Poast®) 1.5 EC 1.5–2.5 pt.	Annual and perennial grass weeds
<i>Remarks:</i> Bearing and nonbearing vines. Include crop oil concentrate at 2 pt./A or methylated seed oil at 1.5 pt./A. Do not apply more than 2.5 pt./A in a single application. Do not exceed 5.0 pt./A per season. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control. PHI 50 days. REI 12 hours.		