

# Weed Management in Blueberry<sup>1</sup>

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Blueberry growers use a system of turf and weed-free strips under the bushes. A weed-free zone under the bushes reduces the impact of weeds on blueberry bush growth. For the first 2–3 years, a strip 2–3 ft. wide is maintained weed free. After 3 years, the weed-free strip is widened to 4–5 ft. 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.

Nonchemical weed management practices are part of a complete weed management program. Cultivation was once a common practice for weed management in blueberries. This management practice is not as widely used now because of bush 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. Polyethylene or landscape fabric mulches provide weed control but can be cost prohibitive.

## Chemical Control

Herbicides available for weed control in blueberry are included in Tables 1 and 2. Because soil types in Florida vary, consult the labels for application rate restrictions based on soil type. Bearing bushes are blueberry bushes that are currently producing fruit. Nonbearing bushes are

blueberry bushes that will not produce fruit for a year after application. The tables include preharvest intervals (PHI).

All herbicides should be directed to the base of the bushes; this method provides coverage of the weeds while minimizing the contact to the bushes. Young bushes should be protected with nonporous wraps or growth tubes to minimize uptake of the herbicide. This is especially important for systemic postemergence herbicides (for example, glyphosate) and contact burndown herbicides (for example, paraquat, diquat, and glufosinate).

Tank mixing can broaden the spectrum of weed control. A preemergence herbicide may only control the most problematic weed in the orchard and leave some weed species unaffected. A preemergence herbicide can be tank mixed with another preemergence herbicide that controls several weed species but not the most problematic weed in the orchard.

The most common method of tank mixing is a postemergence herbicide with a preemergence herbicide. This method provides control of the weeds that are above the soil surface and controls weeds for a longer period. Consult the label for compatible tank mixing partners. If concerned, use a jar filled with the herbicides and water then agitate the jar to see if the herbicides mix.

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Practices for improving weed control with herbicides are as follows:

1. **Herbicide selection.** Preemergence herbicides control the weeds before they emerge from the seed or break the 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 nozzle types or applications of a certain number of gallons per acre (GPA) or nozzle types to ensure 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 herbicides' 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 both weeds that have already and have not yet emerged.
3. **Managing known resistance.** If an area of the field is known to have a resistant weed species, use mechanical weed removal and prevent the weed from producing seeds or other methods of propagation or otherwise propagating itself. Please contact your county Extension agent to have the weed resistance confirmed and documented.

Table 1. Preemergence chemical weed control in highbush blueberry

Common name (lb. a.i./acre)	Trade name (product/acre)	MOA	Crop age	Comments
<b>Dichlobenil</b> 4-6 1.96-3.9	(Casoron®) 4 G 100-150 lb. (Casoron®) 1.4 CS 1.4-2.8 gal.	20	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Annual and some perennial weeds</li> <li>Casoron® 1.4 CS must be applied to well-established plantings and not until at least 1 year after transplanting. Casoron® 4 G can be applied 4 weeks after transplanting. Higher rates may be required to control perennial weed species.</li> </ul>
<b>Diuron</b> 1.2-1.6	(Diuron, Karmex®, Karmex® XP) 80 WDG 1.5-2.0 lb. (Direx®) 4 L 1.2-1.6 qt.	7	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Annual broadleaf and grass weeds</li> <li>Bushes must be established at least 1 year from transplanting. Direct spray solution to the base of the bush to minimize contact with leaves, flowers, and fruits. Diuron may be applied as a single application in the spring (1.2-1.6 lb. a.i./acre) and another application (1.2-1.6 lb. a.i./acre) in the fall.</li> </ul>
<b>Flumioxazin</b> 0.188-0.38	(Chateau®) 51 WDG 6-12 oz.	14	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Annual broadleaf and grass weeds</li> <li>Direct spray solution to the base of the bush. Do not apply to bushes less than 2 years old unless protected by a nonporous wrap, grow tubes, or waxed cylinders. Do not apply between bud break and final harvest. Do not apply more than 12 oz. in a 12-month period. Do not apply more than 6 oz. per application to bushes less than 3 years old in soils with sand plus gravel content greater than 80%. Do not allow Chateau® to come in contact with any green tissue, or injury may occur. Chateau® may be applied in sequential applications, but not within 30 days of each other.</li> </ul>
<b>Isoxaben</b> 0.5-1.0	(Gallery®, Gallery® T&V) 75 DF 0.66-1.33 lb.	12	Nonbearing	<ul style="list-style-type: none"> <li>Certain broadleaf weeds</li> <li>Allow 60 days between applications and do not apply more than 4 lb. product within a 12-month period.</li> </ul>
<b>Isoxaben + Oryzalin</b> 2.0-4.0 + 0.5-1	(Snapshot®) 2.5 TG 100-200 lb.	12 + 3	Nonbearing	<ul style="list-style-type: none"> <li>Certain broadleaf and annual grass weeds.</li> <li>A single rainfall or sprinkler irrigation of 0.5 in. is necessary within 3 days of application for optimum +weed control. Allow 60 days between applications of 150 lb. product/acre or greater. Do not apply more than 600 lb./acre product within a 12-month period. Do not apply to bushes that have wet foliage from rainfall or dew.</li> </ul>
<b>Mesotrione</b> 0.09-0.19	(Callisto®) 4 L 3-6 fl. oz.	27	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Annual broadleaf weeds</li> <li>Apply before prebloom, or illegal residues may occur. Can be applied as a split application of 3 oz. followed by 3 oz. with no less than 14 days between applications. Limit contact with green foliage and stems, or injury may result. Include a crop oil concentrate at 1% v/v. The University of Florida has conducted limited testing; thus, any application should be made on a small acreage first to determine cultivar tolerance.</li> </ul>
<b>Napropamide</b> 4	(Devrinol®) 50 DF 8 lb. (Devrinol®) 10 G 40 lb.	15	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Small-seed broadleaf and annual grass weeds</li> <li>Do not apply within 1 year of planting. Direct spray solution to the base of the bush to minimize contact with foliage and fruit. Applications should be made to a weed-free surface. Napropamide should be cultivated or irrigated to a depth of 2 in. within 24 hours of application.</li> </ul>
<b>Norflurazon</b> 2-4	(Solicam®) 80 WDG 2.5-5.0 lb.	12	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Small-seed broadleaf and annual grass weeds</li> <li>PHI 60 days</li> <li>Consult label for amount of formulation based on soil texture. Do not apply within 6 months of planting. Rainfall or irrigation is required within 4 weeks of application.</li> </ul>
<b>Oryzalin</b> 2-4	(Oryzalin, Surflan®) 4 AS 2-4 qt.	3	Bearing / nonbearing	<ul style="list-style-type: none"> <li>Certain broadleaf and annual grass weeds</li> <li>Irrigation or rain event of 0.5-1 in. is required within 1 week of application.</li> </ul>

Common name (lb. a.i./acre)	Trade name (product/acre)	MOA	Crop age	Comments
<b>Pronamide</b> 1–2	(Kerb®) 50 W 2–4 lb.	3	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Certain broadleaf and grass weeds</li> <li>• Apply in the fall or early winter when temperature is less than 55°F for maximum efficacy. Do not apply to newly planted bushes; wait for root establishment. Immediately follow application with rainfall or irrigation for additional weed control. Do not apply more than 4 lb. product/acre or more than one application in 1 year.</li> </ul>
<b>Simazine</b> 2–4	(Princep®) 90 WDG 2.2–4.4 lb. (Princep®) 4 L 2–4 qt.	5	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Annual broadleaf and grass weeds</li> <li>• Do not apply more than 1 lb. a.i./acre on plantings less than 6 months old. Apply half the maximum in the spring before bud break and half in the fall.</li> </ul>
<b>Terbacil (5)</b> 0.4–1.6	(Sinbar®) 80 WP 0.5–2 lb.	5	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Annual broadleaf and grass weeds</li> <li>• Only apply to bushes that have been planted for 1 year or longer. Do not use in soils with less than 3% organic matter. Use in the spring or after harvest before weeds emerge or shortly after.</li> </ul>

Table 2. Postemergence chemical weed control in blueberry

Common name (lb. a.i./acre)	Trade name (product/acre)	MOA	Crop age	Comments
<b>Carfentrazone</b> 0.016–0.031	(Aim®) 2 EC 1–2 fl. oz. (Aim®) 1.9 EW 1–2 fl. oz.	14	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf weeds</li> <li>• Direct spray solution to the base of the bush to minimize contact with green stems, leaves, flowers, and fruits. Coverage is essential; use a minimum of 20 gal. of spray solution per acre. Include a nonionic surfactant, methylated seed oil, or crop oil concentrate; see label for rate. Do not apply more than 0.031 lb. a.i./acre during the dormant stage, 0.064 lb. a.i./acre during the growing stage, and more than 0.096 lb. a.i./acre per crop season.</li> </ul>
<b>Clethodim</b> 0.07–0.13	(Select Max®) 2 EC 9–16 fl. oz.	1	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Annual and perennial grass weeds</li> <li>• The spray solution should include a nonionic surfactant at 0.25% v/v. Do not apply within 14 days of harvest.</li> </ul>
<b>Diuron</b> 1.2–1.6	(Diuron, Karmex®, or Karmex® XP) 80 WDG 1.5–2 lb. (Direx®) 4 L 1.2–1.6 qt.	7	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Annual broadleaf and grass weeds</li> <li>• Bushes must be established at least 1 year from transplanting. Direct spray solution to the base of the bush to minimize contact with leaves, flowers, and fruits. Diuron may be applied as a single application in the spring (1.2–1.6 qt./acre) and another application (1.2–1.6 qt./acre) in the fall. Read labels for restrictions on soil type. Include surfactant at 0.25% v/v or crop oil concentration at 1.0% v/v to improve postemergence weed control.</li> </ul>
<b>Diquat</b> 0.7–0.9	(Diquat) 2 L 1.5–2.0 pt.	22	Nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and grass weeds</li> <li>• Direct spray to the base of the bush to minimize contact with green stems and foliage. Include a nonionic surfactant at 0.06%–0.5% v/v.</li> </ul>
<b>Fluazifop</b> 0.25–0.375	(Fusilade® DX) 2 EC 16–24 fl. oz.	1	Nonbearing	<ul style="list-style-type: none"> <li>• Annual and perennial grass weeds</li> <li>• Include nonionic surfactant at 0.25%–0.5% v/v or crop oil concentrate at 1% v/v.</li> </ul>
<b>Glufosinate</b> 1.0–1.5	(Rely® 280) 2.34 SL 48–82 fl. oz.	10	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and grass weeds</li> <li>• PHI 14 days</li> <li>• Does not control goosegrass. Efficacy is reduced when temperatures are cool or when weeds are under drought stress. Direct spray solution to the base of the bush to minimize contact with 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./acre.</li> </ul>

<b>Glyphosate</b> 0.5–1.5	(Various formulations)	9	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and grass weeds</li> <li>• PHI 14 days</li> <li>• Direct spray solution to the base of the bush to minimize contact with green stems, leaves, and fruits.</li> </ul>
<b>Halosulfuron</b>	(Sanda) 75DF 1 to 4 yr. bushes 0.5-0.6 oz. >4 yr. bushes 0.5 to 1 oz.	2	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and sedge weeds</li> <li>• PHI 14 days</li> <li>• Avoid contact with green tissues and leaves. Do not apply to bushes less than 1 year old. Minimum of 45 days between applications. Do not apply more than 2 oz./acre per 12 mo. period. Cultivar tolerance is variable. 'Emerald' and 'Jewel' are more tolerant. Some growers have reported 'Prima Donna', 'Scintilla', and 'Springhigh' are less tolerant.</li> </ul>
<b>Mesotrione</b> 0.09–0.19	(Callisto®) 4 L 3–6 fl. oz.	27	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and sedge weeds</li> <li>• PHI 14 days</li> <li>• Avoid contact with green tissues and leaves. Do not apply to bushes less than 1 year old. Minimum of 45 days between applications. Do not apply more than 2 oz./acre per 12 mo. period. Cultivar tolerance is variable. 'Emerald' and 'Jewel' are more tolerant. Some growers have reported 'Prima Donna', 'Scintilla', and 'Springhigh' are less tolerant.</li> </ul>
<b>Paraquat</b> 0.56–1	(Gramoxone Inteon®) 2 SL 2–4 pt. (Firestorm®) 3 SL 1.3–2.7 pt.	22	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and grass weeds</li> <li>• Direct spray to the base of the stem. Use a coarse spray and hooded sprayer to minimize contact with foliage. New canes or shoots can be injured. Include a nonionic surfactant at 0.125%–0.25% v/v or crop oil concentrate at 1% v/v.</li> </ul>
<b>Pelargonic Acid</b>	(Scythe®) 3%–10% v/v	27	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Broadleaf and grass weeds</li> <li>• Contact herbicide that should be applied with a shielded sprayer and direct spray to the base of the bush to minimize contact with green tissue.</li> </ul>
<b>Rimsulfuron</b> 0.063	(Matrix®) SG 4 oz.	2	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• PHI 21 days</li> <li>• Apply after the bushes have gone through one growing season.</li> <li>• Application after bud break may cause temporary chlorosis and/or stunting of leaves. Do not apply more than 4 oz./acre per year. New label and should be trialed on a small area before apply to the entire field.</li> </ul>
<b>Sethoxydim</b> 0.3–0.5	(Poast®) 1.5 EC 1.5–2.5 pt.	1	Bearing / nonbearing	<ul style="list-style-type: none"> <li>• Annual and perennial grass weeds</li> <li>• PHI 30 days</li> <li>• Consult label for exact rate to control specific grass species. Multiple applications may be necessary to control perennial grasses, such as bermudagrass. Include a crop oil concentrate at 1 qt./acre.</li> </ul>