

Weed Management in Pecan¹

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Weeds compete with pecan trees for light, nutrients, and water. Weed interference can be minimized with proper cultural practices and use of herbicides. General maintenance such as controlling weeds in adjacent areas (i.e., nearby fields, ditches, and driving paths), preventing weeds from producing seeds, and cleaning mowing equipment of weed seed will prevent weeds from becoming a serious problem. Cultivation can be used but should be shallow to prevent root pruning and soil erosion.

Chemical Control

Herbicides available for weed control in pecan 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 trees are fruit trees that are currently producing fruit. Nonbearing trees are trees 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 trees; this method provides coverage of the weeds while minimizing the contact to the trees. Young trees 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, 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.

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 from 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

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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) 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 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. It is often suggested that preemergence herbicides be tank mixed with a postemergence herbicide. This method controls both weeds that have 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 otherwise propagating itself. Please contact your county Extension agent to have the weed resistance confirmed and documented.

Table 1. Preemergence chemical weed control in pecan

Common name (lb. a.i./acre)	Trade name (product/acre)	MOA	Crop age	Comments
Diuron 1.6	(Diuron, Karmex®, Karmex® XP) 80 WDG 2 lb. (Direx®) 4 L 1.6 qt.	7	Bearing / nonbearing	<ul style="list-style-type: none"> Annual broadleaf and grass weeds Apply as a single band or broadcast application. Apply in the spring before weeds emerge or during early growth. Apply under trees at least 3 years old. Use on soils with at least 0.5% or greater organic matter.
Flumioxazin 0.19–0.38	(Chateau®) 51 WDG 6–12 oz.	14	Nonbearing	<ul style="list-style-type: none"> Broadleaf and annual grass weeds In soils with sand plus gravel content greater than 80%, do not use more than 6 oz./acre per application to trees younger than 3 years old. Do not apply more than 24 oz./year. Best results if applied as a split application with a minimum of 30 days between applications. Do not apply after flowering unless using a shielded sprayer. Do apply to trees established less than one year, unless protected from spray contact by nonporous wraps, grow tubes, or waxed containers.
Halosulfuron 0.03–0.05	(Sanda®) 75 WDG 0.66–1 oz.	2	Bearing / nonbearing	<ul style="list-style-type: none"> Broadleaf and nutsedge weeds PHI 1 day Do not apply until 1 year after planting and soil has settled around the tree roots. Direct spray solution to the base of the tree and minimize contact with trunk, stems, roots, and foliage. May be tank mixed with glyphosate to broaden spectrum of weed control. Sequential application may be required, but do not exceed 2 oz./acre per season.
Indaziflam 0.065	(Alion™) 5 fl. oz	29	Bearing	<ul style="list-style-type: none"> Broadleaf and grass weeds PHI 14 days Trees must have been established for 3 years. Rate is dependent on soil type. Allow 90 days between applications. Do not exceed 10.3 fl. oz./yr.
Isoxaben 0.5–1.0	(Gallery® or Gallery® T&V) 75 DF 0.66–1.33 lb.	12	Nonbearing	<ul style="list-style-type: none"> Certain broadleaf weeds Direct spray solution to the base of the tree. After application, 0.5–2 in. of rainfall or irrigation are required within 21 days for activation.
Isoxaben + Oryzalin 2.0–4.0 + 0.5–1	(Snapshot®) 2.5 TG 100–200 lb.	12 + 3	Nonbearing	<ul style="list-style-type: none"> Certain broadleaf and annual grass weeds Apply with a drop or rotary-type spreader. Requires 0.5 in. or more of rainfall or irrigation within 3 days of application for activation. Do not apply more than 600 lb. of product/acre per year. Allow 60 days between applications.
Napropamide 4		15	Bearing / nonbearing	<ul style="list-style-type: none"> Small-seed broadleaf and annual grass weeds PHI 35 days Can be applied to newly transplanted trees. Apply in fall or early spring before weeds emerge. Direct spray solution to the base of the tree to minimize contact with foliage and fruit. Cultivate or irrigate to a depth of 2–4 in. within 24 hours of application.
Norflurazon 0.98–2.95	(Solicam®) 80 WDG 1.25–3.75 lb.	12	Bearing / nonbearing	<ul style="list-style-type: none"> Small-seed broadleaf and annual grass weeds PHI 60 days Do not apply until trees are 6 months old. Temporary loss of pigment (whitening) in leaf veins may occur with normal use. Rainfall or irrigation is required within 4 weeks of application. Consult label for postemergence herbicides that can be tank mixed to broaden spectrum of weed control. Can be applied as a sequential application, but do not exceed 1.25–3.75 lb. product/acre per year. After application, 0.5–2 in. of rainfall or irrigation are required to activate the herbicide.

Oryzalin 2–6	(Oryzalin, Surflan®) 4 AS 2–6 qt.	3	Bearing / nonbearing	<ul style="list-style-type: none"> • Certain annual broadleaf and grass weeds • Apply as a sequential treatment with 2.5 months between applications. Do not exceed 12 lb. a.i./acre per year. Irrigation or rain event of 0.5–1 in. is required within 1 week of application. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.
Oxyfluorfen 1.25–1.5	(Goal® 2XL, Galigan®) 2 EC 5–8 pt. (Goaltender®) 4 E 2.5–4 pt.	14	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf weeds • Apply after dormancy is initiated and before bud break. Do not apply more than 1.5 lb. a.i./acre per year in broadcast applications and 2 lb. a.i./acre per year in banded applications. Direct spray solution to the base of the tree using a shielded sprayer. Within 2 weeks of application, 0.5–2 in. of rainfall or irrigation are required to activate the herbicide. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.
Pyraflufen 0.0013	(Venue®) 1.0–4.0 fl. oz.	14	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf weeds • PHI 0 days • Do not apply after bloom. Do not exceed 6.8 fl. oz./season. Do not exceed 3 applications/season. Add a NIS at 0.5 to 2.0% v/v. Allow 30 days between applications.
Rimsulfuron 0.03–0.06	(Matrix® FNV, Matrix® SG) 25 WG 2–4 oz.	2	Bearing / nonbearing	<ul style="list-style-type: none"> • Certain broadleaf weeds and annual grasses • PHI 14 days • Apply after plants are 1 year old. Broadcast application is limited to one application per year at 4 oz./A. Banded applications may be made twice a year with 30 days between applications, not to exceed 4 oz./acre per year. Direct spray solution to the base of the tree, avoiding contact with foliage and fruit (except undesirable suckers). Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.
Simazine 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"> • Annual broadleaf and grass weeds • Do not apply to trees less than 2 years old. Do not apply more than 4 lb. a.i./acre per year. Do not apply when nuts are on the ground, or illegal residues may result. Apply in early spring prior to weed emergence. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.

Table 2. Postemergence chemical weed control in pecan

Common name (lb. a.i./acre)	Trade name (product/acre)	MOA	Crop age	Comments
2,4-D 1.43	(Various formulations)	4	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf weeds • PHI 60 days • Consult individual labels for amount of formulation to include in spray solution. Do not apply during bloom. Trees must be at least 1 year old. Prevent drift from contacting foliage, fruit, stems, and trunks. Withhold irrigation 2 days before irrigation and 3 days after application. Do not apply more than 2 lb. a.i./acre per application, and do not make more than two applications in a growing season. Allow 30 days between applications.
Carfentrazone Up to 0.031	(Aim®) 2 EC Up to 2.0 fl. oz. (Aim®) 1.9 EW Up to 2.0 fl. oz.	14	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf weeds • PHI 3 days • Consult label for appropriate rate based on weed species. Do not apply more than 0.124 lb. a.i./acre in a growing season. Apply with hooded sprayer directed to the base of the tree 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 tree, apply at 0.031 lb. a.i./acre. For all types of applications, include a nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v.
Clethodim 0.14–0.25	(Arrow®, Select®) 2 EC 6–8 fl. oz. (Select Max®) 1 EC 9–16 fl. oz.	1	Nonbearing	<ul style="list-style-type: none"> • Annual and perennial grass weeds • Consult label for rates of nonionic surfactant or crop oil concentrate to include in the spray solution. Direct the spray to the base of the tree.
Diquat 0.7–0.9	(Diquat) 2 L 1.5–2.0 pt.	22	Nonbearing	<ul style="list-style-type: none"> • Broadleaf and grass weeds • Direct spray to the base of the tree to minimize contact with green stems and foliage. Include a nonionic surfactant at 0.06%–0.5% v/v.
Fluazifop 0.25–0.38	(Fusilade® DX) 2 EC 16–24 fl. oz.	1	Bearing / nonbearing	<ul style="list-style-type: none"> • Annual and perennial grass weeds • PHI 30 days • Direct spray solution to the base of the trees to minimize contact with leaves. Do not apply more than 72 fl. oz./acre per season. Include nonionic surfactant at 0.25%–0.5% v/v or crop oil concentrate at 1% v/v. Do not apply when harvestable fruit are on the ground.
Glufosinate 1.0–1.5	(Rel® 280) 2.34 SL 48–82 fl. oz.	10	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf and grass weeds • PHI 14 days • Efficacy is reduced when temperatures are cool or when weeds are under drought stress. Direct spray solution to the base of the tree 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. Consult label for preemergence herbicides that can be tank mixed to broaden spectrum of weed control.
Glyphosate 0.47–4.5	(Various formulations)	9	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf and grass weeds • PHI 3 days • Glyphosate has various formulations. Consult individual labels for rates. Do not exceed 9.6 lb. a.i./acre in a single season. Direct spray solution to the base of the tree to minimize contact with desirable vegetation. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.

Halosulfuron 0.03–0.05	(Sanda®) 75 WDG 0.66–1 oz	2	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf and nutsedge weeds • PHI 1 day • Do not apply until 1 year after planting and soil has settled around the tree roots. Direct spray solution to the base of the tree and minimize contact with trunk, roots, and foliage. Use a nonionic surfactant at 0.25% v/v. May be tank mixed with glyphosate to broaden spectrum of weed control. Sequential application may be required, but do not exceed 2 oz./acre per season.
Paraquat 0.63–1	(Gramoxone Inteon®) 2 SL 2.5–4 pt. (Firestorm®) 3 SL 1.7–2.7 pt.	22	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf and grass weeds • All applications must be made prior to shaking for harvest. Use a shield or wrap plants when spraying around young trees. Direct spray to the base of the trees to minimize drift to foliage, flowers, and fruit. Do not make more than five applications per year. Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.
Pelargonic acid	(Scythe®) 3%–10% v/v	27	Bearing / nonbearing	<ul style="list-style-type: none"> • Broadleaf and grass weeds • Contact herbicide that should be applied with a shielded sprayer and direct sprayed to the base of the tree to minimize contact with foliage and green bark.
Rimsulfuron 0.03–0.06	(Matrix® FNV, Matrix® SG) 25 WG 2–4 oz.	2	Bearing / nonbearing	<ul style="list-style-type: none"> • Certain broadleaf weeds and annual grasses • PHI 14 days • Apply only when plants are 1 year old. Broadcast application is limited to one application per year at 4 oz./acre. Banded application may be applied twice a year with 30 days between applications, not to exceed 4 oz./acre per year. Use a nonionic surfactant at 0.125% v/v. Direct spray solution to the base of the tree, avoiding contact with foliage and fruit (except undesirable suckers). Consult label for herbicides that can be tank mixed to broaden spectrum of weed control.