

# Weed Management in Pecans

## Guide H-632

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Weed competition can reduce growth in a new orchard 50% or more, and kill trees where spot infestations are out-competing young struggling tree seedlings for the available sunlight, moisture, and nutrients. It has been reported that the maximum affect of competition is most threatening to an orchard during the year of transplanting. The second year, this threat is reduced, and by the third and fourth year, harm from competition may be minimal.

Not only do weeds compete with trees, but they also impact by serving as a harbor or host for insects, diseases, and rodents that will influence the quality and quantity of the crop in even the established orchard. These effects, along with the problem of weeds interfering with harvest, all heighten the need to consider weed control as part of an overall pecan orchard management program.

### WEED CLASSIFICATION AND IDENTIFICATION

The first step to weed management in pecans is identifying the weeds present correctly. It is important to know the name of a weed, as well as knowing and understanding the life cycle and reproductive capacity of that plant. Based on the life cycle, which includes germination, vegetative growth, flowering, seed set, and death, grasses and broad-leafed weeds have been grouped into the following:

#### Annuals

Weeds that germinate and complete their life cycle within one year. These weeds spread and reproduce only through seed production.

**Summer annuals.** Plants that germinate in the spring and complete their life cycle in the fall of the same year.

Barnyardgrass

Foxtail

Junglerice  
Marestail  
Pigweed  
Sandbar  
Sprangletop

Kochia  
Morning glory species  
Russian thistle  
Southwestern cupgrass

**Winter annuals.** Plants that germinate in the fall of the first year, overwinter, and complete their life cycle in the spring of the second year.

Downy brome  
London rocket  
Shepherdspurse

Flixweed  
Rescuegrass  
Tansymustard

#### Biennials

Plants that require two years to complete their life cycle. They spread and reproduce by seed production only.

Common mallow

Musk thistle

#### Perennials

Plants that live more than two years. They reproduce by seed and vegetative reproductive structures, such as root buds, rhizomes, crowns, tubers, stolons, or bulbs.

**Simple perennials.** Plants without the ability to spread underground. They spread and reproduce by seed production, crown buds, and cut root segments.

Curled dock

Dandelion

**Creeping perennials.** Plants that are capable of spreading vegetatively by such means as tubers, rhizomes, or root buds.

Bermuda grass  
Johnsongrass  
Silverleaf nightshade  
Yellow nutsedge

Field bindweed  
Purple nutsedge  
Texas blueweed

## WEED MANAGEMENT OPTIONS

### Mechanical Weed Management

Removing the weeds by physical means such as disks, spring-tooth harrows, orchard knives, and mowers. Cultivation is best described as a nonselective control option that is particularly effective for annual weed control. The disadvantages of mechanical control include:

- It is difficult to control weeds near the trees without possible injury to trees or roots.
- Cultivation tends to create favorable conditions for the germination of weed seed near the soil surface, as well as bring up new seed from deeper in the soil profile.
- Cultivation aids in the dispersal of perennial weeds by breaking up their underground vegetative systems and spreading them throughout the orchard.
- The potential compaction of the soil.

### Chemical Weed Management

Using herbicides to control weeds. Some herbicides must be applied to the soil before weeds have emerged and require some form of incorporation, either mechanical or water (*preplant* or *preemergence*) while others are applied after the weeds have already emerged and are growing actively (*postemergence*).

### Preventive Weed Management

Keeping the weeds out from the beginning. This requires an active inventory of current and potential weed problems. Remembering that small weed infestations become big infestations and that the cost goes up as the patch gets bigger will put this aspect of weed management in perspective. This management scheme is particularly important when dealing with perennial weeds because they have the ability to spread underground and are spread by cultivation.

### Biological

Using living organisms to manage other living organisms. The use of biological weed control agents has had greater success on range and pasture area than on the agricultural commodity crops.

## WEED MANAGEMENT SITUATIONS

Weed management in pecans can be performed at these stages: pre-planting, planting, and in established orchards.

### Pre-planting

During a new planting it is important to control any perennial weeds present in the field. The use of glyphosate (Roundup®) is most effective at this time and offers no soil residue. A Roundup® application should be followed by a cultivation no sooner than 7 days. These two operations will control the perennial and annual weeds present. It is important to stress that perennial weeds must be controlled before a planting is established because these weeds are not controlled by preemergence herbicides labelled for use in newly established orchards. Paraquat (Gramoxone Extra®) can also be used to control annual weeds prior to the establishment of the orchard.

### Planting

Preparing the planting row will also kill any emerging weeds. Prior to planting, a preplant incorporated application of trifluralin (Treflan®) can be made to control many annual grassy and broadleaf weeds. (Caution: Trifluralin-treated soil should not be placed in planting holes when trees are planted.)

### Established Orchards

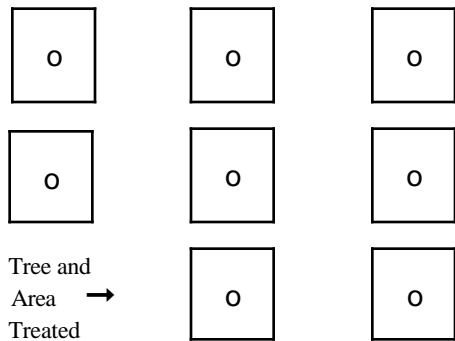
Once an orchard is established, weeds can be managed three ways:

- Using only cultivation.
- Using only herbicides. This approach may prove more costly than the grower wants.
- Using both herbicides and cultivation in an integrated approach. Utilizing the benefits of both methods of control, a grower can manage the weeds in the orchard effectively.

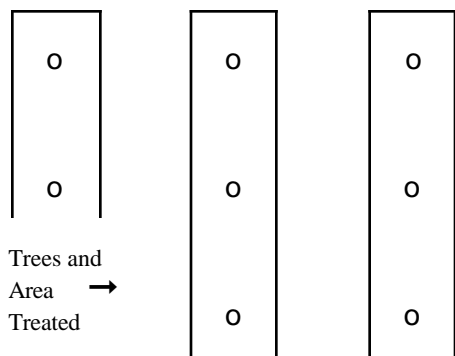
There are two options available to the grower in an integrated approach:

- Using the herbicide to control weeds around the trees and cultivating in both directions around the trees. This option has been found to be effective

under drip irrigation systems where the lines are deep enough to not be disturbed as a result of cultivation.

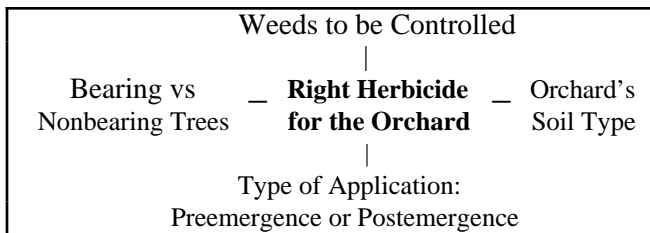


- Using the herbicide to control weeds in the tree rows and cultivating weeds between the tree rows. Rather than cultivate, some growers have mowed weeds between the tree rows.



Leaving a strip of vegetation between the rows for the support of beneficial insects may prove to be effective as well.

Along with deciding how to develop a management operation (fig. 1), the producer should pay particular attention to herbicide labels when considering the use of an herbicide. Particular herbicides are labelled for nonbearing trees only, while others are labelled for nonbearing and bearing trees.



**Fig. 1. Points to consider in developing a weed management plan for pecan orchards.**

Herbicides labelled for weed management in established New Mexico pecan orchards have been grouped according to the time for application. Insecticides labelled only for nonbearing trees are noted.

**Table 1. Weed management in pecans.**

Pre-planting	Planting	Established orchard	
		Nonbearing only	Nonbearing & bearing
•Gramoxone Extra 2.5S	•Treflan 4EC, 5EC, or TR-10	•Poast 1.5EC	•Casaron 4G
•Roundup 4S		•Gallary 75DF	•Devrinol 50DF
•Touchdown 6L		•Snapshot 80DF	•Fusilade 2000
		•Snapshot 2.5TG	•Goal 1.6E
		•Touchdown 6L	•Gramoxone Extra
			•Hi-Dep 3.8S
			•Karmex 80DF
			•Roundup 4S
			•Sinbar 80W
			•Solicam 80DF
			•Surflan A.S.
			•Treflan 4EC, 5EC, or TR-10

**Note:** In looking at the table, be sure to refer to the expanded information presented in the following pages.

In using this summary refer to the herbicide label for complete information concerning rates, timing, weeds controlled, or harvest interval.

Herbicide	Application and Remarks	
<b>Casaron 4G</b> or <b>Dyclomec 4G</b> (dichlobenil)	Rate:	100–150 lb Casaron 4G/A (4.0–6.0 lb ai/A)
	Time:	Apply and incorporate immediately after application in late fall or early spring.
	Weeds:	Will control many grassy and broadleaf weeds including dandelion, foxtail, knotweed, lambsquarters, several mustard species, orchardgrass, pigweed, plantain, purslane, and Russian thistle.
	Remarks:	Do not use on pecan seedlings within 6 months of planting. May be used on bearing, nonbearing, and nursery stock. Do not apply until 4 weeks after transplant. Do not make applications within 1 month of harvest.
<b>Devrinol 50DF</b> (napropamide)	Rate:	8.0 lb Devrinol 50DF/A (4.0 lb ai/A) with an additional 8.0 lb

Herbicide	Application and Remarks	Herbicide	Application and Remarks
	<p>application being labelled for season-long control.</p> <p>Time: Preemergence and incorporated within 24 hours.</p> <p>Weeds: Will control many annual grassy and broadleaf weeds including barnyardgrass, foxtail, Mexican and red sprangletop, pigweed, sandbur, southwestern cupgrass, witchgrass, and others.</p> <p>Remarks: Apply to a weed-free soil surface. May be applied to newly planted or established trees. Does not control established weeds.</p>	<b>Goal 1.6E</b> (oxyfluorfen)	<p>Rate: Preemergence: 6.0–10.0 pt Goal/A (1.2–2.0 lb ai/A) Postemergence: 2.4–10.0 pt Goal/A (0.5–2.0 lb ai/A)</p> <p>Time: Preemergence or postemergence</p> <p>Weeds: Will control several broadleaf weeds including annual morning glory, annual sowthistle, common cocklebur, common purslane, London rocket, prickly lettuce, pigweed, and others.</p> <p>Remarks: Labelled for control of weeds <b>prior to bud swell</b>. Should bud swell occur, must not be used. For postemergence applications, add a surfactant at a rate of 2.0 pts/100 gal total spray mixture. Refer to label for application rates as it relates to weed species. Goal can be tank mixed with other herbicides such as Devrinol, Gramoxone Extra, Karmex, Roundup, Solicam, or Surflan.</p>
<b>Fusilade 2000</b> (fluzifop-P-butyl)	<p>Rate: 1.0–3.0 pt Fusilade 2000/A (0.125–0.375 lb ai/A)</p> <p>Time: Postemergence</p> <p>Weeds: Will control only annual and perennial grasses. Will not control broadleaf weeds or sedge species.</p> <p>Remarks: Labelled for bearing and non-bearing pecans. Always add either a crop oil concentrate at 1% or nonionic surfactant at 0.25% finished spray volume. Repeat applications will be needed to control perennial grasses. Apply as a directed postemergence application in the interspaces and around the bases of the trees avoiding contact with foliage. Do not harvest within 30 days of application. Do not graze treated areas.</p>	<b>Gramoxone Extra</b> (paraquat)	<p>Rate: 2.0–3.0 pt Gramoxone Extra/A (0.625–0.94 lb ai/A)</p> <p>Time: Postemergence</p> <p>Weeds: Annual broadleaf and grass weeds. Will suppress top growth of perennial weeds.</p> <p>Remarks: Gramoxone Extra is a Restricted Use Pesticide and requires certification to purchase and use. Always add a nonionic surfactant at the rate of 1–2 pts/100 gal total spray solution. Thorough coverage is required for control because this is a contact herbicide. Repeat applications may be necessary. Do not allow spray to come in contact with foliage or stems. Do not graze livestock in treated areas. May be tank mixed with Devrinol, Goal, Karmex, Solicam, and Surflan.</p>
<b>Gallary 75DF</b> (isoxaben)	<p>Rate: 0.5–1.0 lb Gallary/A (0.66–1.33 lb ai/A)</p> <p>Time: Preemergence</p> <p>Weeds: Has a broad-spectrum label and controls several broadleaf and suppresses grass species. Weeds controlled include common ragweed, common purslane, henbit, lambsquarters, pigweed, prickly lettuce, prostrate knotweed, prostrate spurge, and others. Suppressed grasses include, crabgrass, foxtail, and goosegrass.</p> <p>Remarks: Strictly a preemergence herbicide and will not control emerged weeds. Do not apply through any type of irrigation system. Labelled <b>only</b> for nonbearing trees.</p>	<b>Hi-Dep</b> (2, 4-D)	<p>Rate: 1.0–1.5 qt Hi-Dep/A (1.0–1.5 lb ai/A)</p> <p>Time: Postemergence</p> <p>Weeds: Will control broadleaf weeds.</p> <p>Remarks: For band or spot treatments. Apply as a directed spray onto the weeds to point of run-off when</p>

Herbicide	Application and Remarks	
		weeds are young and actively growing (pre-bud to early-bud stage). Do not harvest nuts within 60 days of last application. Apply only after irrigation and allow maximum time before the next irrigation. Use only flat fan-type nozzles and low pressures. Do not spray bare ground. Late fall application after harvest and before frost preferred.
<b>Karmex 80DF</b> (diuron)	Rate:	2.0–4.0 lb Karmex/A (1.6–3.2 lb ai/A)
	Time:	Preemergence or early post-emergence
	Weeds:	Will control several grass and broadleaf weed species including annual morning glory, common purslane, kochia, lambsquarters, pigweed, shepherdspurse, tansymustard, and others.
	Remarks:	Use only on trees established in orchards for at least 3 years and on soils with at least 1/2% organic matter. Do not use on eroded areas where subsoil or roots are exposed, on trees that are diseased or lacking in vigor, or on trees planted in irrigation furrows, as injury may result.
<b>Poast 1.5EC</b> (sethoxydim)	Rate:	1.5–2.5 pt Poast/A (0.3–0.5 lb ai/A)
	Time:	Postemergence
	Weeds:	Will control annual and perennial grasses.
	Remarks:	Poast is labelled <b>only</b> for non-bearing trees and should not be used on trees that are within 1 year of production. Refer to the label for the timing and use rate for individual grass species. Always use a crop oil concentrate at a rate of 2.0 pt/A.
<b>Roundup 4S</b> (glyphosate)	Rate:	1.0–5.0 qt Roundup/A (1.0–5.0 lb ai/A)
	Time:	Postemergence
	Weeds:	Will control most grass and broadleaf weeds, including troublesome perennial weeds.
	Remarks:	Rates of application depend on weed species and stage of growth.

Herbicide	Application and Remarks	
		Refer to label for information regarding the control of selected weeds. Roundup is labelled for weed control in site preparation stages, prior to transplant establishment, and in established orchards. Applications can be made using boom equipment, CDA, shielded applicators, hand-held or high-volume wands, lances or orchard guns, or with wiper equipment, except as directed in the label. Extreme care must be exercised to avoid contact of herbicide solution, spray, drift, or mist with foliage or green bark of trunk, branches, suckers, fruit, or other parts of the trees, as injury can occur. Allow a minimum of 21 days between last application and harvest of the crop.
<b>Sinbar 80W</b> (terbacil)	Rate:	2.0–3.0 lb Sinbar/A (1.6–2.4 lb ai/A)
	Time:	Preemergence or postemergence
	Weeds:	Will control several broadleaf and grassy weeds including jimsonweed, knotweed, lambsquarters, marestalk, mustard species, pigweed species, and purslane.
	Remarks:	Apply only to trees established 1 year or more. Do not use on eroded areas where subsoil or roots are exposed, or on trees that are diseased or lacking in vigor. Do not graze or feed forage from treated areas to livestock. Can be tank mixed with Karmex. Refer to labels of both products before using.
<b>Snapshot 80DF</b> (isoxaben + oryzalin)	Rate:	2.5–5.0 lb Snapshot 80DF/A (2.0–4.0 lb ai/A)
	Time:	Preemergence
	Weeds:	Both grassy and broadleaf weedy species, including barnyardgrass, black medic, clover, common groundsel, common lambsquarters, common purslane, crabgrass, cupgrass, curled dock, dandelion, datura species, filaree, foxtail species, hare barley, henbit, junglerice, knotweed, kochia, little mallow, London rocket, marestalk, pigweed species, prickly lettuce, prostrate spurge, Russian thistle, yellow sweetclover, and several

Herbicide	Application and Remarks
	other weedy species.
	Remarks: Only labelled for <b>nonbearing</b> trees. Apply to trees that will not bear fruit for at least 1 year. Do not apply through any type of irrigation system. Will not control established weeds.
<b>Snapshot 2.5TG</b> (isoxaben + trifluralin)	Rate: 100–200 lb Snapshot 2.5TG/A (2.5–5.0 lb ai/A) Time: Preemergence Weeds: Same list as with Snapshot 80DF. Remarks: Same comments as with Snapshot 80DF.
<b>Solicam 80DF</b> (norflurazon)	Rate: 1.25–5.0 lb Solicam/A (1.0–4.0 lb ai/A) Time: Preemergence Weeds: Will control several weeds including barnyardgrass, common purlane, crabgrass, feather fingergrass, flixweed, London rocket, puncturevine, Russian thistle, sandbur, southwestern cupgrass, sowthistle, and witchgrass. It will suppress the following: lambsquarters, marestail, pigweed, purple nutsedge, and silverleaf nightshade. Remarks: Do not use on coarse-textured soils such as sand, loamy sand, and gravelly sand. Be sure to refer to the label for the rate needed for the soil situation in the orchard. Solicam can be applied to bearing and nonbearing orchards and may be used on newly set pecan trees. Do not graze livestock on treated areas.
<b>Surflan 4AS</b> (oryzalin)	Rate: 2.0–6.0 qt Surflan/A (2.0–6.0 lb ai/A) Time: Preemergence Weeds: Will control several weeds including barnyardgrass, crabgrass, cupgrass, foxtail, goosegrass, junglerice, lambsquarters, pigweed, prostrate knotweed, puncturevine, sandbur, and others. Remarks: Labelled for bearing and nonbearing trees. Moisture is required

Herbicide	Application and Remarks
	to move the herbicide into the soil and activate it. Can be tank mixed with several herbicides such as Gramoxone Extra, Karmex, and Roundup. When considering a tank mix, be sure to study the labels of both products carefully to meet the requirements of both herbicides.
<b>Touchdown 6L</b> (sulfosate)	Rate: 0.66–5.33 pt Touchdown/A (0.5–4.0 lb ai/A) Time: Postemergence Weeds: Annual and perennial weeds including annual morning glory species, barnyardgrass, Bermuda grass, Canada thistle, cocklebur, common lambsquarters, common purslane, crabgrass, cupgrass, downy brome, foxtail species, jimsonweed, Johnsongrass, kochia, little barley, mustard species, Russian thistle, spotted spurge, volunteer alfalfa, yellow nutsedge, and several other weedy species. Remarks: Labelled only for <b>nonbearing</b> trees. Always add a nonionic surfactant to the spray mixture. Do not apply if rain is expected within 6 hours. Keep off green actively growing tissue as injury will result.
<b>Treflan 4EC</b> (trifluralin)	Rate: New planting: 1.0–2.0 pt Treflan 4EC/A Established: 2.0–4.0 pt Treflan 4EC/A (0.5–2.0 lb/A) Time: Preemergence Weeds: Will control several weeds including barnyardgrass, brome-grass, crabgrass, foxtail, henbit, junglerice, knotweed, kochia, lambsquarters, puncturevine, purslane, Russian thistle, sandbur, stinkgrass, and others. Remarks: Must be mechanically incorporated to be effective. Do not try to water-incorporate into the orchard soil, as poor weed control will result. Do not apply within 60 days of harvest. Other formulations of Treflan include MTF, 5EC, and TR-10. Refer to the labels of each of these products for application rates.

Be sure to have the orchard well in mind when considering the use of an herbicide. Take the time to read and understand herbicide labels before purchasing them. After purchasing a product, follow the label directions in making the application. It is also impor-

tant to calibrate the application equipment; take time to determine the correct sprayer output and determine the uniformity of the equipment. For more information, contact your local County Extension Office.

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