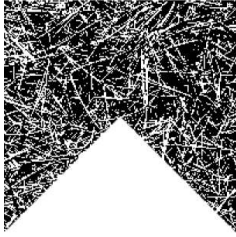


IPM



Commercial Pecan

Insect, Disease, and Weed Control Recommendations
for 2011

INSECT AND DISEASE CONTROL

Current insect and disease control recommendations for commercial pecans are available from the Georgia Pecan Extension Website at <http://www.caes.uga.edu/commodities/fruits/pecan/>. Click on the Pecan Spray Guide to find the latest recommendations for insecticides, fungicides, and nematicides used in pecans.

Since Georgia conditions are similar to those in Alabama, nearly all information provided is applicable to Alabama. However, there are state label registrations on specific pesticides that differ from one state to the other. Always verify the use by reading the label before purchasing and using the pesticide.

WEED CONTROL

Herbicides are recommended for pecan orchards to provide an 8- to 12-foot-wide, weed-free strip between the tree rows. This weed-free strip between rows will reduce weed competition in both the young and the old trees, and it will help increase harvesting efficiency as well as prevent mower damage.

Keep the area between tree rows as a mowed sod, 1 inch or less in height. This sod-herbicide system provides an all-weather roadway for spraying and harvesting equipment and is an effective floor for mechanical harvesting. Also, this system eliminates mechanical disking, which often damages pecan roots and spreads crown gall.

Table 1. Pecan Weed Control

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Preplant Incorporated (PPI)		
TREFLAN TRIFLURALIN (1-2 pt.)	trifluralin (0.5-1 lb.)	Before planting trees, apply to soil as a broadcast spray and incorporate into soil within 8 hours. Use lower rate on coarse soils. Controls most annual grasses and many small-seeded broadleaf weeds. *MOA–Mitosis inhibitor
Preemergence (PRE)		
CHATEAU (6-12 oz.)	flumioxazin (0.19-0.38 lb.)	For use in NON-BEARING ORCHARDS only. DO NOT use more than 6 ounces per acre per application on sandy soils. Keep spray off the trunk of trees. Provides residual control of several weeds. May be mixed with Gramoxone, glyphosate, or Rely. MOA–PPO inhibitor
GALLERY 75DF (0.66-1.33 lb.)	isoxaben (0.5-1 lb.)	Apply ONLY to trees that will not bear harvestable fruit within 12 months. May be applied after soil has settled around newly planted trees. Controls several winter annual broadleaf weed species. MOA–Cellulose inhibitor
GOAL 2XL (2-8 pt.)	oxyfluorfen (0.5-2 lb.)	Apply ONLY to dormant trees. Goal should be applied to the soil and to the base of trees. Controls winter annual weeds. May be tank mixed with Devrinol, Surflan, or Solicam for residual grass control. DO NOT apply after budswell. MOA–PPO inhibitor
KARMEX DF (4 lb.) or DIREX 4L or DIURON 4L (3 qt.)	diuron (3.2 lb.)	Use ONLY where trees have been established 3 years or more. Controls many annual grasses and broadleaf weeds. Apply before weeds emerge, in spring for summer weed control, or in fall for winter weed control. If summer and winter weed control is desired, apply half the recommended rate in spring and half in fall. DO NOT use in areas where tree roots are exposed. If used as an early postemergence treatment, add a surfactant at the rate of 2 quarts per 100 gallons of spray. Best results are obtained on succulent weed seedlings. DO NOT use on sandy or loamy sand soils. DO NOT allow livestock to graze in treated areas. Karmex may be tank mixed with Surflan. See label for appropriate use rate. MOA–Photosystem II inhibitor

*MOA=Mechanism of action. Herbicides with different MOAs should be used in weed resistance management programs. See Table 2 for classifications of mechanisms of action.

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Preemergence (PRE) (cont.)		
PRINCEP CALIBER 90 (2.2-4.4 lb.) or PRINCEP 4L or SIMAZINE 4L (2-4 qt.)	simazine (2-4 lb.)	Apply to orchards established more than 1 year. Controls many annual grasses and broadleaf weeds. Apply before weeds emerge, in spring for summer weed control, or in fall for winter weed control. If summer and winter weed control is desired, apply half the recommended rate in spring and half in fall. Apply to orchard floor and avoid contact with tree foliage or green stems. Will not control established weeds. DO NOT use on sandy or loamy sand soils. DO NOT allow livestock to graze in treated areas. See label for appropriate use rate. Princep may be tank mixed with Surflan or Gramoxone. MOA–Photosystem II inhibitor
PROWL H ₂ O (4-8 pt.)	pendimethalin (2-4 lb.)	Apply preemergence to control annual grasses and small-seeded broadleaf weeds. Will not control emerged weeds. DO NOT apply to newly planted trees until soil has settled around roots. DO NOT apply within 60 days of harvest. MOA–Mitosis inhibitor
SOLICAM 80DF (2.5-5 lb.)	norflurazon (2-4 lb.)	Apply under bearing and non-bearing pecan trees. DO NOT apply until the soil has settled around transplanted trees. Make only one application per year either as a fall postharvest treatment or as an early spring treatment. DO NOT graze treated areas. Solicam can be tank mixed with Gramoxone. MOA–Carotenid biosynthesis inhibitor
SURFLAN AS (2-6 qt.)	oryzalin (2-6 lb.)	Apply under bearing and non-bearing pecan trees. DO NOT apply to newly transplanted trees until the soil has settled and no cracks are present. Use the low rate for 2 to 4 months of weed control, the medium rate for 6 to 8 months, or the high rate for 8 to 12 months of weed control. Controls many annual grasses and small-seeded broadleaf weeds. DO NOT allow livestock to graze treated areas. MOA–Mitosis inhibitor
Postemergence (POST)		
RAGE EC (1-2 oz.)	carfentrazone (0.016-0.031 lb.)	Apply alone or mixed with other herbicides for foliar control of several broadleaf weeds. Has no grass or soil residual activity. Add non-ionic surfactant at 2 pints per 100 gallons or crop oil concentrate at 8 pints per 100 gallons. Keep spray off of green pecan tissue. No preharvest interval is required. MOA–PPO inhibitor
FUSILADE DX (1 pt.) + Crop Oil Concentrate (2 pt.) or Non-ionic Surfactant (0.5 pt./25 gal. spray mix)	fluazifop-butyl (0.2 lb.) + crop oil concentrate or non-ionic surfactant	Apply as a directed spray using a maximum of 25 gallons of spray solution per acre. Use hollow cone or flat fan nozzles. A non-phytotoxic crop oil concentrate or non-ionic surfactant must be used with this herbicide. Use a crop oil concentrate with Fusilade to control perennial grasses, such as bermudagrass and johnsongrass. Repeat application may be needed if regrowth occurs. Broadleaf weeds and nutsedges (nutgrass) will not be controlled by this herbicide. DO NOT harvest within 30 days of treatment. MOA–ACCase inhibitor

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Postemergence (POST) (cont.)		
GRAMOXONE INTEON (2-4 pt.) or FIRESTORM (1.25-2.5 pt.) + Non-ionic Surfactant (0.5 pt./50 gal. spray mix)	paraquat (0.5-1 lb.) + non-ionic surfactant	One-year-old trees may have green bark and be injured by herbicide contact. DO NOT allow the spray to contact green stems, fruit, or foliage. Controls many annual broadleaf weeds and grasses and top-kills perennials. Apply as a directed spray when weeds and grasses are succulent and new growth is 1 to 6 inches high. Has no residual activity. Also useful as a knock-down chemical on sod middles. Observe safety precautions. DO NOT allow livestock to graze on treated areas. Paraquat is a RESTRICTED USE pesticide. MOA–Photosystem I inhibitor
POAST 1.5E (1.5-2.5 pt.) + Crop Oil Concentrate (2 pt.)	sethoxydim (0.25-0.5 lb.) + crop oil concentrate	Provides control of annual and some perennial grasses. Apply as a directed spray in a maximum of 20 gallons of spray solution per acre. A repeat application may be needed. Broadleaf weeds and nutsedge will not be controlled. DO NOT harvest within 15 days after application. MOA–ACCcase inhibitor
RELY (3-6 qt.)	glufosinate (0.75-1.5 lb.)	Apply under trees of all ages, bearing or non-bearing, for control of annual and perennial weeds and grasses. DO NOT apply within 14 days of harvest. DO NOT allow livestock to graze in treated areas. MOA–Glutamine synthetase inhibitor
ROUNDUP or TOUCHDOWN or GLYPHOSATE (generic forms) + Non-ionic Surfactant (1 pt./25 gal. spray mix)	glyphosate (1-4 lb.) + non-ionic surfactant	Apply under NON-BEARING trees that are more than 2 years old. May be applied to BEARING trees of any age. DO NOT allow spray to contact foliage or green stems of trees. Controls a broad spectrum of annual and perennial weeds and grasses. DO NOT allow livestock to graze in treated areas. See label for specific rates. MOA–EPSP inhibitor
SANDEA (0.66-1.33 oz.)	halosulfuron (0.032-0.063 lb.)	Provides postemergence control of nutsedge and several other weeds. Apply as a directed spray under trees established for 1 year or more. Use lower rates on sandy soil. Add non-ionic surfactant at 2 pints per 100 gallons of spray mix. DO NOT apply within 1 day of harvest. MOA–ALS inhibitor
SELECT 2E (6.8 fl.oz.) + Crop Oil Concentrate	clethodim (0.09-0.125 lb.) + crop oil concentrate	For control of annual and perennial grasses in NON-BEARING orchards only. Add a crop oil concentrate at 2 pints per 25 gallons of spray mix. MOA–ACCcase inhibitor
2,4-D 4E (various brands) (3 pt.)	2,4-D amine (1.4 lb.)	Apply to vegetation between DORMANT trees for control of emerged winter annual weeds. DO NOT apply within 2 weeks of budbreak. Clean spray equipment thoroughly after using this product. MOA–Synthetic auxin

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Chemical Mowing		
ROUNDUP or TOUCHDOWN or GLYPHOSATE (generic forms)	glyphosate (0.12-0.5 lb.)	Inhibits bahiagrass seedhead formation and suppresses vegetative growth of bahiagrass and bermudagrass. Use the low rate for bahiagrass or for bermudagrass growing under shade. Apply 2 weeks after green-up or after mowing to a height of 3 to 4 inches. DO NOT apply more than twice per season. See label for additional comments. MOA–EPSP inhibitor

Table 2. Herbicide Classified by Mechanism of Action

Mechanism of Action	Herbicide
Acetolactase Synthase (ALS) inhibitors	Sandea
Acetyl CoA Carboxylase (ACCase) inhibitor	Fusilade, Poast, Select
Carotenoid biosynthesis inhibitor	Solicam
Enolpyruval shikimate-3-phosphate (EPSP) inhibitor	Roundup, Touchdown
Glutamine synthesis inhibitor	Rely
Mitosis inhibitor	Prowl, Treflan, Surflan
Protoporphyrinogen oxidase (PPO) inhibitor	Chateau, Goal, Rage
Photosystem I inhibitor	Gramoxone, Firestorm
Photosystem II inhibitor	Karmex, Direx, Pincep, Simazine
Synthetic auxin	2,4-D

Table 3. Estimated Effectiveness of Recommended Herbicide Treatments on Important Weeds Infesting Pecans in Alabama and Properties That May Affect Water Quality¹

WEEDS	HERBICIDES					
	Treflan (PPI)	Chateau (PRE)	Gallery (PRE)	Karmex (PRE)	Princep (PRE)	Solicam (PRE)
Bahiagrass	2	0	0	1	1	4
Bermudagrass	2	0	0	0	0	4
Blackberry	0	2	0	1	1	2
Crabgrass	9	5	0	8	8	8
Florida Pusley	9	8	6	8	9	8
Goosegrass	9	4	0	8	8	8
Lambsquarter	5	9	9	9	8	5
Morningglory	0	8	5	5	7	5
Nutsedge	0	0	0	0	0	7
Pigweed	9	9	9	9	9	9
Prickly Sida	0	8	6	4	9	9
Ragweed	3	9	9	8	8	8
Texas Panicum	9	1	0	4	4	4
Surface-loss Potential	S	M	S	M	M	M
Leaching Potential	S	S	S	M	M	M

continued

¹ Ratings are based on observations of research plots and field use under average weather conditions for several years by weed control workers in Alabama and the South. Leaching and surface-loss potentials are based in part on herbicide chemical characteristics and pesticide behavior models developed by USDA scientists as well as on field experience.

² The surface-loss potential indicates the tendency of the pesticide to move with sediment in runoff.

³ The leaching potential indicates the tendency of the pesticide to move in solution with water and to leach below the root zone.

KEY TO CONTROL RATINGS AND ABBREVIATIONS

Ratings on a scale of 0 to 10: 0 = No control; 10 = 100% control; -- = Information not available.

PPI = Preplant Incorporated; PRE = Preemergence; POST = Postemergence.

S = Small; M = Medium; L = Large.

Table 3. Estimated Effectiveness of Recommended Herbicide Treatments on Important Weeds Infesting Pecans in Alabama and Properties That May Affect Water Quality¹ (cont.)

WEEDS	HERBICIDES						
	Surflan (PRE)	Rage (POST)	Gramoxone (POST)	Fusilade, Poast (POST)	Rely (POST)	Roundup, Touchdown (POST)	Sandea (POST)
Bahiagrass	0	0	3	8	8	8	0
Bermudagrass	0	0	3	8	8	8	0
Blackberry	0	4	3	0	--	6	0
Crabgrass	8	0	7	9	9	9	0
Florida Pusley	8	1	6	0	--	9	--
Goosegrass	8	0	8	9	9	9	0
Lambsquarter	5	8	8	0	8	9	--
Morningglory	0	9	8	0	--	9	4
Nutsedge	0	0	4	0	7	7	8
Pigweed	9	7	9	0	8	9	8
Prickly Sida	0	1	6	0	--	9	--
Ragweed	4	1	8	0	8	9	8
Texas Panicum	7	0	9	9	8	9	0
Surface-loss Potential²	M	S	S	M	S	S	
Leaching Potential³	S	S	S	S	S	S	

¹ Ratings are based on observations of research plots and field use under average weather conditions for several years by weed control workers in Alabama and the South. Leaching and surface-loss potentials are based in part on herbicide chemical characteristics and pesticide behavior models developed by USDA scientists as well as on field experience.

² The surface-loss potential indicates the tendency of the pesticide to move with sediment in runoff.

³ The leaching potential indicates the tendency of the pesticide to move in solution with water and to leach below the root zone.

KEY TO CONTROL RATINGS AND ABBREVIATIONS

Ratings on a scale of 0 to 10: 0 = No control; 10 = 100% control; -- = Information not available.

PPI = Preplant Incorporated; PRE = Preemergence; POST = Postemergence.

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PECAN MANAGEMENT CHECKLIST

Each year, the pecan producers who get maximum returns from the dollars they invest in pecan growing are those who carry out certain key management practices. Use this maximum return checklist to check up on your pecan management system. If you cannot mark off each of these points for your own operation, you may be missing out on maximum returns.

G Test fertility annually and follow recommendations. Get a leaf analysis and soil test in each orchard every year. Poor soil fertility, including deficiency in both major and minor elements, is a severe problem in unmanaged orchards. Maintaining good soil fertility and pH of 6.5 or better is essential for profitable yields year after year.

G Scout orchards regularly for problems. Have a trained person check thoroughly at least once a week during the growing season. Some growers hire consultants or scouts while others prefer to check their own orchards. Scouting allows for the proper timing of control measures, helps identify pest problems, and provides the records needed for planning pest control in future years. Scouting can also tell you how effective your applications have been and how complete your spray coverage is. Except for fungicides, automatic applications of pesticides are a poor investment. Select and apply pesticides recommended for the specific pests present. Observe "threshold levels" where they have been established for particular pests.

G Irrigate if economically feasible. Timely irrigation increases the average yield and quality of pecans. It provides a measure of insurance against loss during dry years, and it can help ensure that an orchard bears annually. Before installing irrigation, however, study the costs to find out if irrigation is economically justifiable in your orchard.

G Maintain orchard sanitation. Remove all the limbs, shucks, old nuts, and excessive ground cover to reduce any insect pest problems, disease incidence, and weed competition. Make it a practice to keep your orchard clean.

G Prune and train young trees. Pruning and training is a must for development of strong, well-balanced trees and to ensure a maximum fruiting surface. Older, established trees that present a closed canopy should also be pruned to allow sunlight penetration and to increase fruiting surface. Thinning of trees in older orchards may be needed.

G Use sod-strip weed control. Use herbicides to create a 10- to 14-foot-wide weed-free strip within the tree rows. Row middles may be planted in winter annuals or legumes or established in perennial summer grasses. Creation of the weed-

free strip reduces weed competition in both young and old trees and lessens the possibility of cultivation and mower injury to trees.

G Do not cultivate under trees. Pecan trees generally have shallow feeder-roots, and cultivation can injure or sever them. If crown gall is present in the orchard, cultivation can spread this disease from tree to tree as the roots are cut.

G Keep middles under control. Lush growth of winter annuals during the spring can cause problems. If this situation exists, clip row middles closely as soon as the spray program is started. Keeping row middles controlled during the pecan growing season will reduce weed competition and humidity, help permit good air flow in the orchard, and eliminate breeding areas for some insect pests.

G Apply a budbreak fungicide spray. Scab infection of young leaves can begin immediately after budbreak. Apply the first fungicide sprays in time to protect the developing foliage against infection. Early application of fungicide is essential to keep scab incidence low throughout the remainder of the growing season.

G Control diseases using a regular spray program. Begin your fungicide spray program at budbreak and maintain a 14- to 21-day schedule throughout the growing season. Early in the season and during humid periods, use the shorter interval for better control. Use the recommended rate of fungicide and at least 10 gallons of spray volume per tree for good coverage.

G Don't spread crown gall. When planting new trees, do not use any which have galls or abnormal growths on the roots. Rid the orchard of berry vines, which are a natural host for crown gall, and don't spread crown gall by cultivating or mowing close to trees.

G Use beneficials when possible. Based on careful scouting, allow low levels of damaging foliage-feeding pests early in the season in order to help build up a beneficial insect population. These insects can help keep even larger infestations of damaging insects in check later in the season.

G Use trapping to detect nut pests. Pests such as the hickory shuckworm and pecan weevil are best detected by traps. Blacklight traps are essential for determining shuckworm populations. Cone emergence traps allow detection of weevil emergence patterns. Time insecticide applications by the findings of such traps.

G Maintain orchard pest infestation records. Complete yearly records will help you identify pest hot spots and annual trends in each orchard.

For more information and for specific recommendations, contact your Extension county agent. You can get detailed information applicable to conditions in your area. You can also get cost-and-return budgets and up-to-date publications on pecan production.

ANR-54, Pecan Production
ANR-86, Weed Control For Fruits And Nuts (annual)
ANR-248, Pecan Orchard Floor Management

ANR-260, Pecan Weevil Control
ANR-275, Hickory Shuckworm Control
ANR-F1SF4, Pecan Pest Management Record Forms

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For more information, contact your county Extension office. Visit <http://www.aces.edu/counties> or look in your telephone directory under your county's name to find contact information.

Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency or the Alabama Department of Agriculture and Industries. If a registration is changed or canceled, the rate listed here is no longer recommended. Before you apply **any** pesticide, check with your county Extension agent for the latest information.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

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