

Sunflowers Grown for Dove Hunting

Robert C. Scott
Professor, Extension
Weed Scientist

Travis Faske
Assistant Professor,
Extension Plant
Pathologist

Gus Lorenz
Professor, Extension
Entomologist

Leo Espinoza
Associate Professor,
Extension Soil Scientist



(Courtesy A. C. Haralson, Arkansas Department of Parks and Tourism.)

Sunflower is a crop that has limited commercial production in Arkansas. Potential markets are limited, and farm-to-market transportation may be cost prohibitive.

Most producers in Arkansas are marketing seed locally as birdseed or growing sunflowers for dove hunting. Sunflowers grown for dove hunting can be a recreational and profitable undertaking when fields are leased for guided dove hunting ventures. Proper planning and the use of good practices will enhance sunflower production. Key considerations for growing sunflowers for dove hunting include variety selection, planting date and weed control.

Soil and Planting

Well-drained sandy and silt loams are best, but sunflowers will grow on a variety of soil textures. Heavy-textured clay loam soils with good moisture-holding capacity are advantageous during droughty years. Sunflowers are easily damaged by waterlogged conditions; therefore, poorly drained soils should be avoided.

The seedbed should be firm with adequate moisture for rapid

germination. It is not advisable to plant on a bed when soils are not well drained or are likely to become saturated from frequent heavy rains, since sunflowers are easily damaged by excessive soil moisture. The use of bedder-roller systems may facilitate adequate drainage while still utilizing narrow row production options.

Planting Date

Sunflowers can be planted from late March to early July, with the optimum date being from mid-April to mid-May. Soil temperature at the 4-inch depth should be at least of 45°F for planting.



Sunflower germination requires a soil temperature near 50°F. Extended periods of soil temperatures below 50°F will delay germination and extend the period of susceptibility to seedling diseases. When growing sunflowers for dove, early planting dates help ensure that sunflowers are mature for the opening weekend of dove season. **Care should be taken to follow current regulations available from the Arkansas Game and Fish Commission concerning baiting and crop manipulation. These regulations can change from year to year.**

Sunflowers should be planted $\frac{3}{4}$ to 1½ inches in moist soil. It is not advisable to plant more than 1½ inches deep since many of the newer hybrids have a short hypocotyl that cannot emerge from deep planting.

*Arkansas Is
Our Campus*

Visit our web site at:
<http://www.uaex.edu>

Attempts should be made in all cases to avoid planting sunflowers deeper than 3 inches. Sunflowers may be rotary hoed to aid emergence should soil crust from compacting rains. Best results are with row- or drill-seeded sunflowers; however, broadcast incorporation is used by many growers, especially sportsmen. Care should be taken to cover seed with at least 1 inch of soil. This will help prevent losses from bird damage and limit damage from preemergence herbicides.

The number of sunflower seed per pound varies considerably, depending upon the variety and seed size. The seed size is identified on the bag. The seed bag information will indicate the planter plates and setting needed to get a desired planting rate.



Sunflower Varieties

Sunflowers are not typically bred for production in southern states. However, most varieties carried by the local seed dealer or co-op will suffice for production for dove hunting. Some variety information is available in fact sheet FSA2018, *Sunflower Production in Arkansas*, and is available from the Extension Service. The authors of this fact sheet prefer a black oilseed type variety for its good production and earliness characteristics.

A final stand of between 18,000 and 30,000 plants per acre is adequate for oil-type hybrids. This normally requires **4 to 5 pounds of seed per acre**. The plant population with non-oil types (confectionary and birdseed) can be reduced to between 15,000 and 22,000 plants per acre. A larger seedhead and seeds are developed by reducing plant population. Plant population per acre should remain the same regardless of row spacing. The seed spacing must be proportionately decreased with lower-germinating seed, but the number of seeds per foot of row is increased. A good rule of thumb to use for adjusting seeding rates is to allow for 80 percent germination and 90 percent seedling survival. Achieving the proper seeding rate with broadcast seeding is difficult. Typically, broadcast seeding will result in stands that are too dense.

Use conventional equipment and row spacings of 28 to 38 inches (or whatever is used with other crops being grown), but keep the plant stand between

18,000 to 30,000 plants per acre for oil types and 15,000 to 22,000 for non-oil types.

Narrow rows, 15 to 18 inches, do not have a significant yield advantage over conventional row spacing when plant populations are the same. Conventional row spacings also allow for weed control by cultivation. In addition, wider rows are often desired for dove hunting.

Fertilization

Follow soil test recommendations. Generally, soils with moderate to low levels of phosphorus (P) and potassium (K) will need nitrogen, phosphorus and potassium (NPK) at a rate of 50, 40 and 60 pounds per acre, respectively, at planting. For best results, incorporate around 200 to 300 pounds per acre of triple 19 or triple 13 prior to planting or apply to dry ground ahead of a rain.

Weed Control

Consult the sunflower section in Extension publication MP44, *Recommended Chemicals for Weed and Brush Control*, for specific herbicide rates and timings. (See Figure 1.)

A combination of tillage, early planting and herbicides provides the best weed control program for sunflowers. Plant in a clean, tilled seedbed or use a burndown application of glyphosate or paraquat to remove existing vegetation in no-till sunflowers. Prior to planting, a preplant-incorporated treatment of Treflan, Prowl or Sonalan can be used to provide residual grass control. After planting, a preemergence application of Prowl or Dual can be used for residual grass control. Broadleaf weed control has always been a challenge for sunflower producers. Spartan herbicide can now be applied preemergence (immediately after planting) for residual broadleaf weed control in sunflowers. **Do not apply Spartan preplant incorporated or directly to sunflowers after they have emerged.** All soil-applied herbicides mentioned above will require a rainfall after application to activate them.



(Courtesy A. C. Haralson, Arkansas Department of Parks and Tourism.)



Sunflower plot treated with Dual + Spartan PRE followed by Select early-post.



Untreated sunflower plot.

Figure 1. Sunflower Herbicides, Rates and Application Information¹

Herbicide/Rate	Application Information
Preplant Incorporated	
Dual Magnum 1.33 pt/A	For annual grasses, nutsedge and small-seeded broadleaf weeds.
Prowl 3.3 EC or Pendimax 3.3 EC 1.2 to 3.6 pt/A	For annual grasses and small-seeded broadleaf weeds. Incorporate within seven days. Use low rate on sandy soils.
Sonalan HFP 1.5 to 3.0 pt/A	Prior to planting, annual grasses and small-seeded broadleaf weeds. Incorporate with two passes in opposite directions no more than 48 hours after application. See label for improved groundcherry control program.
Treflan, Trilin, Trifluralin 4 EC 1.0 to 2.0 pt/A	For annual grasses and small-seeded broadleaf weeds up to 14 days prior to planting. Incorporate immediately. Use 1.0 pt/A on sandy soils.
Preemergence	
Dual Magnum 1.33 pt/A	Immediately after planting for annual grasses and small-seeded broadleaf weeds. Do not apply POST. Avoid high rates.
Prowl or Pendimax 3.3 1.2 to 3.6 pt/A	Immediately after planting for annual grasses and small-seeded broadleaf weeds. Must receive activating rainfall within seven days. Do not apply POST.
Spartan 4F 4.0 oz/A	For annual broadleaf weeds up to three days after planting. Do not use POST. Tank mixtures of Prowl or Dual with Spartan have performed well in University trials. Requires rainfall for application.
Postemergence	
Select 2 EC 8.0 oz/A Use 1 qt/A or 1.0% v/v crop oil concentration	For annual grasses, johnsongrass and red rice, apply to 2- to 6-inch tall grass weeds. Must add crop oil concentrate. Avoid applications during periods of drought.
Clearfield Sunflowers	
Beyond 1 AS 5.0 oz/A Surfactant and liquid nitrogen are required as adjuvants	For annual grasses, suppression of johnsongrass and certain broadleaf weeds. Good on broadleaf signalgrass and foxtail; apply on 3- to 4-inch weeds and grass. Avoid applications during dry periods. Preliminary research has shown that a soil-applied program is needed prior to making POST Beyond applications in Arkansas. Use on Clearfield hybrids only!

¹ Sunflower recommendations are based on drilled or planted sunflowers. Broadcast seeding may result in an increased risk for herbicide injury.

There are currently no post-applied broadleaf herbicides for sunflowers, with the exception of Beyond for Clearfield sunflowers (see below). For annual grass and johnsongrass control, a post application of Select or Poast can be used. Crop oil concentrate should be included with these herbicides for optimum activity. Avoid applications of these herbicides during periods of drought.

One or two early cultivations in combination with herbicides may be beneficial; however, cultivation should be delayed if preemergence herbicides are activated by rainfall and good weed control is established. Late-germinating morningglories can cause severe lodging late in the season in heavily infested fields.

Clearfield Sunflowers

Clearfield sunflowers are now commercially available. The term “Clearfield” refers to a plant that has been selected and bred for tolerance to the imadazolinone family of herbicides. These include Scepter, Pursuit, Beyond, Newpath and several others. However, Beyond herbicide is currently the only imadazolinone herbicide registered for use on Clearfield sunflowers. In university trials, Beyond herbicide has performed fairly well on broadleaf signalgrass, johnsongrass and certain broadleaf weeds. It has not performed well on nutsedge, barnyardgrass, crabgrass and many other weeds commonly found in areas where sunflowers are grown for dove. In addition, excellent moisture and growing conditions are required prior to making postemergence applications of Beyond for optimum activity. These conditions are not always present in dryland sunflower production. Due to the increased seed and chemical costs associated with growing Clearfield sunflowers and the weed control spectrum, their use in growing sunflowers for dove in Arkansas may be cost prohibitive.

A tank-mix of Dual plus Spartan applied preemergence followed by a postemergence application of Beyond is a good herbicide program for Clearfield sunflowers.

Diseases

General recommendations for all diseases include planting resistant hybrids, rotating to a grass crop every other year, using four-year rotations where diseases are prevalent, using treated seed, planting after soil warms adequately, planting on well-drained soil, destroying old crop residue and maintaining good soil fertility.

There are numerous diseases of commercial sunflowers, but their importance varies greatly by region and the intensity (and frequency) of production. Important diseases historically include seed rots/seedling blights, Sunflower rust, Downy Mildew, Sclerotinia wilt, stalk rot and head rots (especially *Rhizopus* head rot), while Charcoal rot, Southern blight, *Alternaria* and other leaf spots, *Verticillium* wilt and *Phomopsis* stem canker may become

important in local situations. Descriptions and pictures of these diseases can be found at <http://sunflowernsa.com/growers/diseases/>.

Growers who repeatedly plant on the same spot year after year are asking for trouble as diseases will build up over time, then – combined with the right environment – can take out an entire planting. So rotation with a grass crop is a really important idea. The destruction of old sunflower stalks and residue is equally important after the season.

Seed rots and seedling diseases of sunflowers are commonplace in the South, especially when the crop is planted early before soil temperatures have warmed enough to sustain consistent germination and growth of the seedlings. Treated seed will probably help where stand establishment tends to be erratic or difficult. Fungicide seed treatments labeled for use on sunflower planting seed include metalaxyl (Allegiance®) or mefenoxam (Apron XL®) for Pythium seed rot and damping off control; captan (Captan® and other products) for general seed protection; and azoxystrobin (Dynasty®) for *Rhizoctonia* seedling blight control.

Downy mildew can be a major problem on poorly drained soils, so planting in well-drained seedbeds when soil temperatures are warm will help avoid this problem. Metalaxyl and mefenoxam seed treatments may also help minimize downy mildew, and resistant hybrids should always be planted – although new races of the fungus may negate this control option in certain regions.

Foliar diseases can be mostly managed using resistant hybrids and crop rotation. In some areas, rust and leaf spots may become important. While foliar fungicides have not been routinely developed and used on sunflowers, a recent product called *Headline*® containing the strobilurin fungicide pyraclostrobin has been registered for use on the crop. It is limited to two applications and is most effective if applied early in disease development. Excellent coverage is essential with this product. For sunflower rust, plant resistant hybrids and use *Headline*® fungicide where warranted.



(Courtesy A. C. Haralson, Arkansas Department of Parks and Tourism.)

Insect Control

Cutworms/Armyworms

Insect damage to sunflowers in Arkansas is sporadic. Cutworm and armyworm larvae are occasionally damaging to newly germinated plantings, thus close monitoring early in the season is warranted. Early signs of infestation often appear as “window paning” on young leaves caused by small larvae not eating through the entire leaf. Notches on cotyledons are also a sign of larval infestations. As larvae develop, the damage will turn to wilted and dying seedlings. Under cool, wet conditions, stand reduction due to delayed plant development and pest feeding can occur. Cutworm larvae feed at night and stay concealed during the day underground within a few inches of



Cutworm Larva
(Courtesy Clemson University.)

damaged plants. The threshold for stand loss is the presence of cut plants, one or more larva per square foot and plant stands have been reduced by 15 percent or greater.

Sunflower Head Moth

The most common and the most damaging pest of sunflower in Arkansas is the sunflower head moth, *Homoesoma electellum*; however, they seldom cause damage to healthy early plantings. Late plantings can sustain economic damage. Adults are grayish in color, $\frac{3}{8}$ to $\frac{5}{8}$ inch long. At rest, the wings are kept close to the body, giving the moth a cylindrical or cigar shape. Adult females lay their eggs on the base of florets in the early bloom stage of the sunflower. A newly hatched larva is pale yellow and darkens to brown or purple with longitudinal white stripes as it develops. The larvae bore into the head and cause damage to the head and seed. Tangled mats of webbing on the face of flowers are a sign of infestation. Injury caused by larval feeding can cause development of fungal diseases such as *Rhizopus* head rot, resulting in severe yield loss.

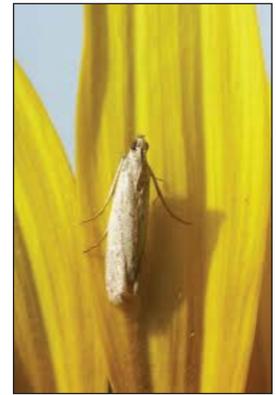
Start scouting for head moth at early flowering. High populations can be detected by walking through fields and watching for moths to fly. The treatment threshold is one to two moths per five plants. If treatment is warranted, continue scouting through seed development. Early-planted fields typically suffer the



Sunflower Head Moth Larvae
(Courtesy Kansas State University.)

most damage from sunflower moths while late-planted fields are less likely to develop damaging infestations. However, delayed planting increases losses from other pests. Preventative

insecticide treatment is best applied as blooms begin to open. If moths are present, treatments should be made at 20 to 40 percent bloom. The objective is to kill females before eggs are laid and remove larvae before they move into the head. Multiple applications at 5 to 7 days may be required under heavy infestation. Consider using high volume applications 10 to 20 GPA by ground and 5 GPA by air.



Sunflower Head Moth Adult
(Courtesy Kansas State University.)

Leaf Feeders

Leaf feeders, such as loopers, thistle caterpillar and saltmarsh caterpillar, are commonly not a problem. However, insecticide applications may be warranted if defoliation reaches 25 percent during bloom and larvae are present. Grasshopper populations should not exceed eight per square yard.

Consult the Extension publication MP144, *Insecticide Recommendations for Arkansas*, in the “Sunflower Insect Control” section for specific insecticide rates and timing of application. (See Figure 2.)

Pollinators

Although hybrid sunflowers are largely self-fertilizing, some reports indicate yield may be enhanced by pollinators. Honeybees in particular are highly susceptible to many of the insecticides commonly labeled for use in sunflower. By restricting insecticide applications to very early in the morning or late in the afternoon, mortality can be reduced. Warn local beekeepers before applying insecticides to avoid problems.

Maturity

Maturity is indicated by change in color of the back of the head. Physiological maturity is reached when heads are flexible, yellow on the back and the outer bracts have turned brown. When planted early, most hybrids will reach adequate maturity 2 to 3 weeks prior to the first weekend in September.

Resources

For more information on sunflower production, see the following resources:

- Arkansas Game and Fish Commission, <http://www.agfc.state.ar.us/>.
- Porter, O. A., and S. E. Izekor. *Sunflower Production in Arkansas*, FSA2018. 1890 Cooperative Extension Program, University of Arkansas, Pine Bluff, AR.
- Scott, R. C., K. Smith and J. Boyd, *Recommended Chemicals for Weed and Brush Control*, MP44. University of Arkansas Division of Agriculture, Little Rock, AR.
- Sloderbeck, P. E., J. P. Michaud, R. J. Whitworth and R. A. Higgins. *Sunflower Insect Management*, 2005, MF-814. Kansas State University. www.oznet.ksu.edu/library/ENTML2/MF814.
- Studebaker, Glenn, *Insecticide Recommendations for Arkansas*, MP144. University of Arkansas Division of Agriculture, Little Rock, AR.

Figure 2. Sunflower Insecticides, Rate and Application Recommendations.

Insect	Insecticide	Formulation/Acre	Application/Comments
Sunflower Head Moth	<i>Bacillus thuringiensis</i>	Check label.	
	Many insecticides (particularly Sevin, Asana, Adjourn, Baythroid, Silencer, Proaxis, Declare, Mustang Max, Respect, Lambda-Cy and Karate) are very hazardous to honeybees. If blooming sunflowers must be treated, notify local bee-keepers so bees can be moved or confined during application.		
	chlorpyrifos (R*) Lorsban Adv. 3.755 EC	1.0-1.5 pt 0.47-0.7 lb ai/A	DO NOT apply more than 6 pts of chlorpyrifos 4 E per season. DO NOT allow livestock to graze in treated areas.
	β -cyfluthrin (R) Baythroid XL 1 EC	2.0-2.8 oz 0.016-0.022 lb ai/A	
	esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz 0.03-0.05 lb ai/A	DO NOT exceed 0.2 lb ai per acre of Asana or Adjourn per season.
	flubendiamide Belt 4 SC	2-4 fl oz 0.0625-0.125 lb ai/A	DO NOT graze or feed treated forage to livestock.
	γ -cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	2.56-3.84 oz 1.02-1.54 oz 0.01-0.015 lb ai/A	
	λ -cyhalothrin (R) Karate 2.08 CS	1.28-1.92 oz 0.02-0.03 lb ai/A	DO NOT exceed 0.12 lb ai per acre of Karate, Silencer or Lambda-Cy per season after bloom initiation. DO NOT apply as an ULV spray.
	methadathion Supracide 2 E	2.0 pt 0.5 lb ai/A	DO NOT graze Supracide-treated areas or feed treated forage to livestock.
	ζ -cypermethrin 0.8 EC (R) Mustang Max/Respect	2.24-4.0 oz 0.014-0.025 lb ai/A	
Cutworm	chlorpyrifos (R) Lorsban 15 G	6.75 lb 1.0 lb ai/A	At planting, place Lorsban granules in 6- to 7-inch band over the row behind planter. Incorporate in top 1-inch of soil.
	β -cyfluthrin (R) Baythroid XL 1 EC	0.8-1.6 oz 0.007-0.013 lb ai/A	Treat at 1 or more cutworms per sq ft or if plant stand losses are approaching the lower limits for optimum plant population.
	esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz 0.03-0.05 lb ai/A	
	γ -cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz 0.0075-0.0125 lb ai/A	
	λ -cyhalothrin (R) Karate 2.08 CS	0.96-1.6 oz 0.015-0.025 lb ai/A	
	ζ -cypermethrin 0.8 EC (R) Mustang Max/Respect	2.24-4.0 oz 0.014-0.025 lb ai/A	

*R = restricted use pesticide

Printed by University of Arkansas Cooperative Extension Service Printing Services.

DR. ROBERT C. SCOTT, professor and Extension weed scientist in Lonoke, **TRAVIS FASKE**, assistant professor and Extension plant pathologist in Lonoke, **DR. GUS LORENZ**, professor and Extension entomologist in Lonoke, and **DR. LEO ESPINOZA**, associate professor and Extension soil scientist in Little Rock, are with the University of Arkansas Division of Agriculture.

FSA2150-PD-2-13RV

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.