Growing and Managing Sunflowers
for Dove Fields in the Southeast

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Natural Resources Conservation Service &

Mississippi State University Extension Service

MISSISSIPPI STATE UNIVERSITY
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Photo credit: USDA-Natural Resources Conservation Service

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The mourning dove (*Zenaida macroura*) is one of the most numerous, widely hunted, and economically valuable game birds in Mississippi and the Southeast. For decades, landowners and wildlife managers have planted fields in agronomic crops to attract doves for sport hunting—a practice that led to these types of fields being known more simply as "dove fields."

Mourning Dove

Throughout much of the Southeast, dove fields traditionally have been planted in one or more grain crops such as corn, sorghum, millets, wheat, and sunflowers. Although the concept of planting sunflowers to attract doves is nothing new, their use as a dove field crop has been limited over the years. However, when environmental conditions permit, a well-managed stand of sunflowers can be one of the most productive dove fields in the Southeast.

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Sunflower growth and yield depend on many variables, including seed variety, site selection, planting dates, seed bed preparation and planting methods, fertilization, and weed control. The goal of this publication is to help you customize a dove field program and provide the latest research findings on sunflower varieties and management strategies that will enhance dove hunting on your property.

Note: Sunflowers in the milk or dough maturity stage are susceptible to depredation by white-tailed deer. Thus, in areas with high deer densities, it may be difficult to produce a good seed crop.

Site Selection

Site selection plays an important role in creating successful dove fields. However, potential for crop production and yield success is only one component of selecting a dove field site. In addition to an ample food supply, other site characteristics, such as proximity to water, availability of perching and loafing areas, and field size, contribute to a site's potential for attracting and "holding" doves. Think about it this way: "Feed them and they will come, but feed them and accommodate them and they will stay."

Soils

Soil characteristics are particularly important for sunflower production and seed yields. Sunflowers are best adapted to moderate- to well-drained soil types, such as loams and "sandy" soils. Whereas sunflowers can be grown on other soil types, their growth rates and seed yields on less suitable soils are often less than when grown on ideal soils. Also, sunflowers do not tolerate prolonged wet conditions and should not be planted on low-lying flood-prone sites. In cases of marginal sites where field conditions may become too wet, "hipping" or "bedding" can help improve drainage and create more suitable growing conditions.

Soil type is a key component for good sunflower production.

Additional Resources & Structure

Site proximity to additional resources and accommodating structures will enhance a field's attraction to doves. Doves detect food by sight, so locate fields adjacent to tree lines or power lines where they tend to perch. This will make it easier for the doves to find seeds scattered throughout the sunflower field. Additionally, such structures provide necessary loafing and resting areas close to a food source. Lastly, doves prefer feeding locations within 1 mile of watering sites and sources of grit (small gravel and sand needed for grinding seeds). One method for providing grit onsite is to maintain strips of bare soil in sunflower fields. A nearby gravel road can provide an additional source of grit.

A group of mourning doves perch on a powerline adjacent to agricultural fields.

Field Size

The recommended minimum acreage for establishing a dove field is about 5 acres. A 5-acre field with good seed production will usually attract enough birds to provide hunting opportunities, at least for the first few weeks of the hunting season. Also, keep in mind that fields need to be large enough to provide a safe hunting environment. As a general rule, an acre of field per hunter is adequate, but this may vary depending on the shape of the field and the lay of the land.

Note: When hunting a field, always be aware of your position in relation to other hunters, public roads, residential areas, and livestock.

Field Preparation

Sunflower fields can be established using either conventional or no-till planting methods. For conventional tillage, a firm seedbed is required. Achieve a firm seedbed by disking and then cultipacking or rolling. If firming equipment is not available, then disking should occur 2 to 4 weeks before planting to allow the soil to settle. A good rain can then firm the seedbed. Any weed growth between tillage and planting can be controlled using a non-selective burndown herbicide (e.g., glyphosate) at planting.

Use of no-till planting equipment requires only a burndown application before planting. Depending on weed pressure and growth, burndown can be done 2 to 4 weeks before planting.

A burndown herbicide is applied before planting.

Sunflowers can be planted with most planting equipment, but a no-till seed drill is most commonly used.

As mentioned previously, sunflowers can be grown on "beds" or "hips." In addition to improving drainage, raised rows also warm faster and can allow earlier planting in more northern climates. Newly hipped rows will require at least one rain before planting. They should then be conditioned the same day as planting using a spring tooth harrow or bed roller. Established beds can be used for multiple years and will only require a burndown herbicide application before planting.

A harrow can be used for soil conditioning before planting.

Planting Dates

Recommended planting dates for sunflowers range from early April through early June. For dove fields, choose your planting date so that seed maturity will coincide with the desired hunting opportunities. For example, black-oil sunflowers mature in about 100 to 120 days, so a mid-April planting date will provide mature seed in mid-August. If the objective is to have an opening-day hunt (around September 1 in most southeastern states), following these guidelines will allow for 2 to 3 weeks of dove field preparation before opening day.

Choose planting dates so that seed maturity coincides with dove hunting opportunities.

Based on historic weather data, April 10–20 is an ideal planting time for sunflowers in Mississippi, but this date may vary depending on your location in the Southeast. This planting date most closely coincides with favorable spring rain patterns and temperatures throughout the state, while also providing ample time for seed maturity and field preparation before opening day of dove hunting season.

Soil temperatures above 55 °F are necessary for planting sunflowers. However, soil temperatures at or above 65 °F are more favorable. Sunflower seeds planted at a ¾-inch depth with sufficient soil moisture and soil temperatures of 65 °F or above should emerge less than 1 week after planting.

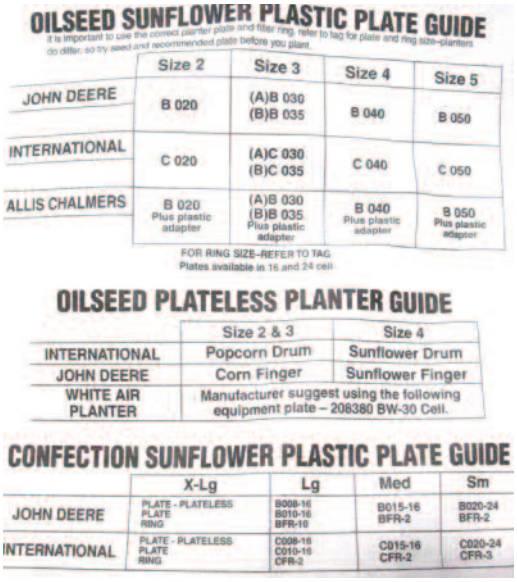
Seed Spacing and Planting Depths

The optimal planting rate for sunflowers is less than most people would expect. Three to five pounds of seed per acre planted on 30- to 40-inch row widths (one to two plants per foot within a row) should yield a final crop of 18,000 to 26,000 sunflower plants per acre. This planting rate should result in a good crop seed yield and provide adequate leaf canopy to aid in weed control. *Refer to Table 1 for additional information regarding row widths and crop populations.* Fertile soils can support a greater density of sunflower plants, whereas poorer soils should have a lower plant population to ensure adequate seed production.

Differences in seed size among varieties of agronomic crops have resulted in changes to the way seed is now packaged and sold, as well as recommended seeding rates. Most crop seed is now bagged and sold based on a specified seed count rather than weight, and pounds per acre seeding rates have mostly been abandoned and replaced with plant populations.

Planting Equipment

The two main types of planters commonly used for sunflowers are conventional plate planters and vacuum planters. Conventional plate planters have a wide range of plates and plate sizes available for common brands of planter equipment. As a result, some seed bags include plate size and number charts that correspond with certain brands of planter equipment. Typically, an 8- to 12-cell planting plate is better for planting sunflowers. If plate size information is not available, cotton and/or corn plates will perform well.


OILSEED SUNFLOWER PLASTIC PLATE GUIDE

	Size 2	Size 3	Size 4	Size 5
JOHN DEERE	B 020	(A)B 030 (B)B 035	B 040	B 050
INTERNATIONAL	C 020	(A)C 030 (B)C 035	C 040	C 050
ALLIS CHALMERS	B 020 Plus plastic adapter	(A)B 030 (B)B 035 Plus plastic adapter	B 040 Plus plastic adapter	B 050 Plus plastic adapter

FOR RING SIZE–REFER TO TAG
Plates available in 16 and 24 cell

OILSEED PLATELESS PLANTER GUIDE

	Size 2 & 3	Size 4
INTERNATIONAL	Popcorn Drum	Sunflower Drum
JOHN DEERE	Corn Finger	Sunflower Finger
WHITE AIR PLANTER	Manufacturer suggest using the following equipment plate – 208380 BW-30 Cell.	

CONFECTION SUNFLOWER PLASTIC PLATE GUIDE

	X-Lg	Lg	Med	Sm
JOHN DEERE	PLATE - PLATELESS PLATE RING	B008-16 B010-16 BFR-10	B015-16 BFR-2	B020-24 BFR-2
INTERNATIONAL	PLATE - PLATELESS PLATE RING	C008-16 C010-16 CFR-2	C015-16 CFR-2	C020-24 CFR-3

Plate and plateless planter guides are listed on the back of a black-oil hybrid sunflower seed bag.

Table 1

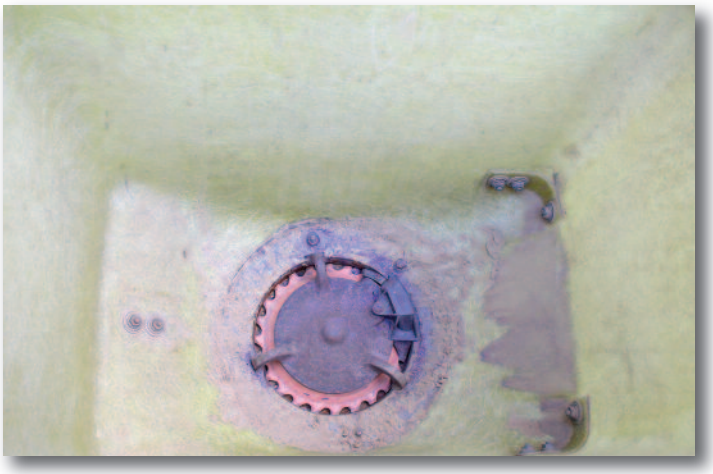
Seed per foot of row for common planter widths and optimum sunflower plant populations.

	Optimum Plant Population[a]				
	18,000	20,000	22,000	24,000	26,000
Row Width (Inches)		Seeds Per Foot of Row[b]			
40-inch rows	1.6	1.8	2	2.2	2.4
38-inch rows	1.5	1.7	1.9	2.05	2.2
36-inch rows	1.5	1.6	1.8	1.9	2.1
30-inch rows	1.2	1.35	1.5	1.6	1.8

[a]Higher plant populations should be used on more productive soils, while lower plant populations should be used on marginal soils.
[b]Planting rates are reflective of seed with an 85 percent germination rate.

Ideally, sunflowers should be planted using conventional equipment, such as row planters or seed drills. Calibrate planting equipment to dispense seeds 6 to 12 inches apart within the row at ¾- to 1½-inch depths. Planting depth is critical because when planted at depths greater than 1½ inch, smaller-seeded black-oil hybrids will not emerge from the soil.

Plate planters have multiple seed bins (one for each row), and each bin has a round plate at the bottom. Plates have openings or cells that are sized to allow one seed in each cell. Cells are evenly spaced in order to control the rate at which seeds are dropped in the furrow or sown. *Contact your local county Extension office if you need additional help with calibrating a planter or selecting planter plate sizes.*



A four-row plate planter (left) dispenses seed. Each seed bin on the planter has a plate at the bottom (lower left) that controls the rate at which seeds are dropped. Planters have a variety of plate sizes, like this 16-cell planter plate (upper right).

Vacuum planters are the most accurate planting equipment for achieving a specified planting rate. Although conventional planters are proven to create productive sunflower fields, vacuum planters dispense seed more accurately and are better for maintaining a specific planting rate. Typically, vacuum planter settings are listed on hybrid sunflower bags.

Like many other agronomic crops, seed sizes often differ between varieties of black-oil hybrid sunflowers. Therefore, be sure to match the seed size with the proper plate size to maintain accurate planting rates. To remove the guesswork, seed size of black-oil hybrid varieties is always identified on the bag.

Size and number of seed are listed on bags of black-oil hybrid sunflowers.

Sunflowers are planted using a 12-row vacuum planter.

Fertilization

Soil fertilization for sunflower production should adhere to soil test recommendations for phosphorus (P), potassium (K), and agricultural lime. Also, pay special attention to soil test recommendations for boron (B), a critical micronutrient for sunflower production. When adequate amounts of P and K are present in the soil, a single application of 75 to 100 units of nitrogen (N) applied when plants are 8 to 14 inches tall will produce optimum results.

The most cost-effective and user-friendly way to apply N to row crops is via a Coulter rig, or what is commonly referred to as a "knife" rig. A knife rig requires no calibration and is equipped with a pump that has precise settings for the exact amount of N to be applied. Liquid N (32 percent solution) is dispensed into the ground adjacent to the plants without touching any green tissue, thus ensuring a more direct transfer of N to sunflower plants and not weeds. Furthermore, most agricultural dealers/suppliers provide use of a knife rig to customers who purchase fertilizer. This is especially helpful if the grower lacks the necessary equipment and knowledge of fertilizer application or equipment calibration.

Nitrogen was applied to these no-till rows of sunflowers at 8 to 14 inches tall. Notice the grooves where liquid nitrogen was "knifed" into the soil.

A Coulter rig or knife rig is the most cost-effective and user-friendly way to apply nitrogen to row crops.

Broadcast applications of granular nitrogen are an option for sunflower fields, but can be problematic. Spreader equipment must be calibrated to dispense the recommended amounts of nitrogen fertilizer, and if not done correctly the first time, it can be costly. Applying too much N initially will require additional amounts to complete the field application. Applying too little N initially will require backtracking across N "shorted" areas of the field to dispense the recommended amount. Also, young sunflower plants may experience leaf burn as a result of N contact with their leaves. Ammonium nitrate (34-0-0) or urea (46-0-0) are the most common types of granular N fertilizer used. *Contact your local county Extension office if you need help deciding what type of fertilizer application best suits your needs or assistance with spreader calibration.*

Weed Control

Weed control is a key component of managing sunflowers for dove fields. Doves prefer to feed in areas of clean, open ground. An effective weed control program will render fields more attractive to doves. In addition, eliminating or reducing weed competition not only improves field conditions for doves, but improves sunflower growth and seed production as well.

Herbicide applications are the most cost-effective and practical means of weed control in sunflower fields.

Herbicide applications are the most practical and cost-effective means of weed control in sunflower fields. For many years, only a few herbicides were labeled and marketed for use with sunflowers. However, because sunflower production is on the rise, more herbicides are labeled for sunflowers than ever before. In addition, genetically modified herbicide resistant sunflower hybrids (e.g., Clearfield) are now being developed and marketed.

Weed control via herbicide applications is essential for maximizing sunflower seed yields. See Figure 3 of the research brief in the following section.

In the event that a pre-emerge herbicide application does not result in the desired level of weed control, a row crop cultivator can be used to help control weeds between plant rows. Sunflower plants grow very fast, so the window of opportunity for cultivation is only during the first 3 to 4 weeks of growth. Sunflower plants that are already drought stricken should not be plowed because cultivation releases soil moisture.

The crop canopy helps to keep the sunflower field clean. Herbicides and/or cultivation should only be used early in the growing season until sunflower plant leaves can shade the ground beneath them and control the weeds themselves.

Herbicides should be applied according to weed pressure, plant height, and equipment height.

Field Preparation for Attracting Doves

As previously mentioned, dove field preparation should begin 2 to 3 weeks before opening day of the hunting season, or the first date you plan to hunt the field. This gives you enough time to prepare the field for hunting and to attract and concentrate doves at the field site. If planting was timed properly, sunflower seed heads will have matured and be completely dried and ready for mowing at this time.

We recommend mowing strips within the field every 1 to 3 weeks to shatter the seed and facilitate feeding. This practice will also provide doves with new seed on a continual basis. Be sure to leave some standing rows of sunflowers for hunter concealment. These remaining strips will also serve as a surplus seed source to be distributed later in the hunting season. Width of mowed strips can be determined by equipment size and/or personal preference.

Mowing strips in sunflower fields shatters seed heads and helps scatter seeds across the ground.

Before mowing, a chemical desiccant can be applied if late-season weed pressure has occurred or sunflowers are not completely dried. Sunflowers are physiologically mature when outer bracts on the seed heads are brown and the backs of heads are yellow. If needed, desiccants applied at this time will speed drying, increase seed shatter when mowing, and help clean fields of late-season weeds. Some chemical desiccants commonly used on sunflowers are sodium chlorate, glyphosate, and paraquat.

Sunflowers are physiologically mature when outer bracts on the seed heads are brown and the backs of heads are yellow.

When to Apply a Desiccant

Timing of desiccant applications depends on the type of desiccant being used.

- Glyphosate requires more time to work than paraquat and sodium chlorate and can be applied as early as 14 days before mowing sunflowers. However, glyphosate works best when applied to actively growing plants. At 14 days before mowing, sunflowers should be at the end of their growth cycle. Thus, while it may not be as effective for drying sunflowers before mowing, it will clean up weed problems and increase amounts of bare ground by the hunt date.
- Paraquat can be applied 2 to 3 days before mowing. It rapidly removes moisture from sunflowers and weeds and will help improve bare ground in areas of the field where weed pressure is relatively high.
- Sodium chlorate effectiveness depends on both weather conditions and application rates. High temperatures and clear skies accelerate the effectiveness of sodium chlorate, so a lower application rate is usually sufficient when applied under these weather conditions. Assuming an average application rate and ideal weather conditions, sodium chlorate should be applied 7 days before mowing. Sodium chlorate will have some "dry down" effect on weeds, but it is minimal. It should not be used in place of herbicides to help control weeds and increase bare ground.

To produce sufficient amounts of bare ground, fields can be planted in alternating strips or blocks while leaving unplanted areas between them. These unplanted areas can then be disked or sprayed every 2 to 4 weeks to maintain bare ground. Continue to maintain bare ground areas throughout the hunting season.

Planting sunflowers in alternating strips or blocks will create more bare ground that helps make a field attractive to doves.

Note: Mourning doves are federally regulated migratory birds. Both federal and state laws regarding baiting regulations should be considered when preparing dove fields. Consult with local enforcement officers to avoid illegal field preparation.

- For additional information regarding other plantings for wildlife, refer to MSU Extension Publication 2111 *Supplemental Wildlife Food Planting Manual for the Southeast*, or visit http://msucares.com/pubs/publications/p2111.pdf.

- For additional information regarding weed control, refer to MSU Extension Publication 1532 *Weed Control Guidelines for Mississippi*, or visit http://msucares.com/pubs/publications/p1532.pdf.

Schedule for Developing a Successful Sunflower Planting for Doves

Date	Activity
Jan. 1–Feb. 1	Select the best location to meet the doves' needs: perching areas, nearby water, sources of grit, etc.
Jan. 1–Feb. 1	Select the best location in terms of soil type and quality; a well-drained, fertile site that is readily accessible to planting and maintenance equipment. *Proper site selection is likely the most important step toward success of your field.*
Feb. 1–28	Collect soil samples and submit for pH and nutrient analysis.
Mar. 1–Apr. 1	Amend the soil according to soil test recommendations.
Mar. 1	Decide which variety of sunflower is the most cost-effective option. On smaller fields where seed yield may limit dove use, consider planting a black-oil hybrid variety. Larger fields likely provide a sufficient amount of seed, so Peredovik may be the most cost-effective variety. Also, Peredovik may be the best choice for fields located on moderate- or poor-quality soils. Order seed to ensure on-time delivery.
Mar. 15–Apr. 1	For conventional till, fully prepare seedbed as early as possible so that a rain event can occur before the planting date. If freshly hipped rows are part of the seedbed preparation, then a rain event is a must. Hipped rows should be rolled down the same day as planting. Apply burndown herbicide 2 to 3 weeks before a no-till planting.
Apr. 10–25	Determine the date of the first hunting opportunity and plant seed according to desired crop maturation date. Be sure to allow at least 2 weeks before the first hunting date for mowing strips of sunflowers to make seed available and attract birds.
Apr. 10–25	Determine which herbicide system to use. *Proper use of herbicides is likely the most important step toward planting success.* Follow all label recommendations when applying herbicides. Plant seed according to recommended planting rate and depth. Remember, more is not better—too many plants will result in crowding and competition for resources, and ultimately reduce crop yield.
Apr. 30–May. 15	Apply nitrogen at recommended levels.
Apr. 30–Jun. 1	Apply post-emergence herbicide at recommended rate.
May 1–Aug. 31	Maintain areas of bare ground by disking throughout growing season.
Aug. 1–Sep. 1	When crop is mature, about 2 to 3 weeks before the first hunt, mow several strips of sunflowers to shatter the seed heads and distribute seeds across the ground.
Sep.–Dec.	Continue to maintain bare ground by disking, and mow rows of sunflowers as needed for subsequent hunting throughout the season.

Research Findings

A Comparison of Black-oil Sunflower Varieties and Herbicide Systems for Dove Field Management Decisions

Since the early 1980s, the Peredovik variety of sunflowers has been highly recommended by Extension specialists and wildlife biologists as the choice variety for dove field plantings. This popularity originated from a 1980 U.S. Fish and Wildlife Service study of food preferences of wild birds. In this study, 21 different agronomic crop seeds (sunflowers, corn, millet, etc.) were placed in test feeders and offered to wild birds. The result was that most bird species, including mourning doves, consistently preferred small, black-oil sunflower seeds over other crop seeds. At that time, Peredovik was one of a few small, black-oil varieties available on the market and soon became the standard variety of sunflower for dove fields.

In recent years, increased global demand for seed oil production has led to the development of new black-oil hybrid varieties of sunflowers with better disease resistance and greater seed yield. Although development of these new varieties was largely a response to greater human consumer demands, many biologists and hunters recognized these new sunflower hybrids as an option for dove field plantings. The ability of these hybrids to produce greater seed yields may ultimately attract more doves to sunflower fields. As such, we compared the yield and cost of planting hybrid varieties of sunflowers to the common Peredovik variety. Our goal was to compare the costs and benefits of planting the Peredovik to the new black-oil hybrid sunflower varieties. We also evaluated the use of two different herbicide systems as a means of effective weed control in sunflower fields and quantified the benefits of herbicides on sunflower yield.

Sunflower Variety Test

We compared six hybrid black-oil sunflower varieties (Dekalb 3830 and 3836, DynaGrow 93C05, Pioneer 63A70, and Triumph 669CL and 665) to the traditional Peredovik variety to—

1) determine if seed yield differed among the hybrid varieties and from the Peredovik variety, and

2) compare the cost-effectiveness of black-oil hybrid sunflowers to the traditional Peredovik variety.

Because new black-oil hybrid sunflower varieties are constantly being developed, the varieties we tested may be difficult to find or no longer available. If so, a seed company representative or seed supplier can recommend an available hybrid variety.

Study Sites

We selected three sites in the northwest portion of Mississippi for our experiment. The first site was in Coahoma County on Robinsonville very-fine sandy loam soil in the Delta soil resource region; the second site was in Sharkey County on Sharkey clay soil in the Delta soil resource region; and the third site was in Yalobusha County on Oaklimeter silt loam soil in the Upper Thick Loess soil resource region. These three sites were selected to represent a broad range of soil conditions in Mississippi. *See Figure 1 for site locations.*

Methods

- Planting dates throughout this 3-year study ranged from April 12 to April 30.
- We used a planting rate of two seeds per foot of row on 38- to 40-inch row widths. On our study sites, about 24,000 plants per acre produced optimum yield. *See Table 1 to determine optimum plant populations based on row widths.*
- Plots were fertilized 3 to 5 weeks post-emergence with 100 units of nitrogen.
- Sunflower heads were harvested at maturity and allowed to dry before collecting seed yield data.

Results

Our results demonstrated that in the most fertile soil (Robinsonville very-fine sandy loam), the hybrid black-oil sunflowers produced an average of 1,677 pounds of seed per acre compared to the Peredovik's 767 pounds per acre (a 118 percent difference in seed yield). In the Sharkey clay, hybrid varieties produced an average of 797 pounds of seed per acre compared to the Peredovik's 441 pounds per acre (a 108 percent difference in seed yield). However, on the Oaklimeter silt loam soil, hybrid vari-

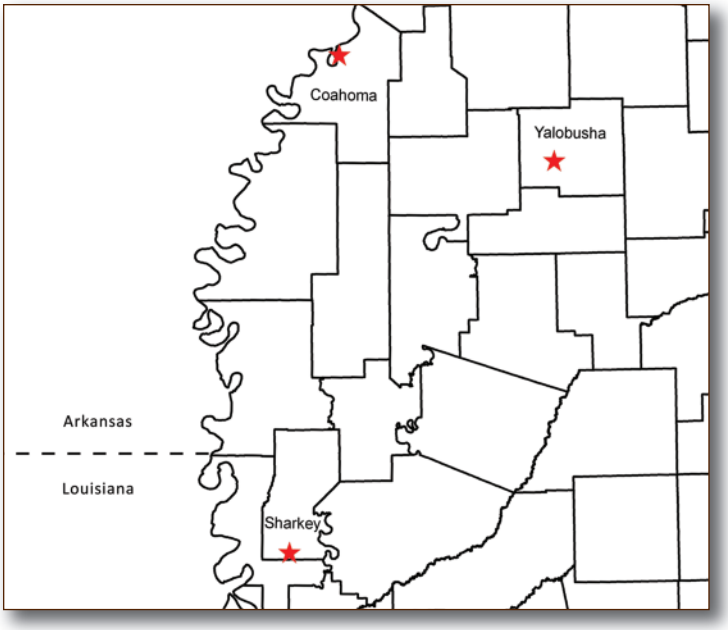


Figure 1
Site locations for sunflower variety tests in three different soil areas of Mississippi.

eties only produced an average of 438 pounds of seed per acre, whereas the Peredovik variety produced an average of 516 pounds per acre (6 percent more seed than the hybrid varieties). *See Figure 2, A–F for sunflower variety seed production.*

Soil type had a substantial impact on sunflower seed yield. The combined average seed yield of hybrids and Peredovik on the Robinsonville very-fine sandy loam was 1,547 pounds per acre versus 741 pounds per acre on the Sharkey clay and 450 pounds per acre on the Oaklimeter silt loam. Thus, seed yield was an average of 109 percent greater on the Robinsonville very-fine sandy loam than on the Sharkey clay, and an average of 244 percent more seed yield than on the Oaklimeter silt loam. Also of note is the difference in seed yield between years. Averaged across all areas and varieties, there was a 262 percent drop in seed production from 2006 to 2007 (*Figure 2, A–F*). This drastic decline in seed production is most likely a result of yearly rainfall differences. Test plots received greater amounts of rain in 2006, whereas in 2007 locations received very little rainfall after sunflowers emerged.

Mature dried sunflower heads were harvested by hand.

Before seed yields are determined, sunflower heads are threshed to separate seeds from the flower chaff.

In terms of hybrid varieties, there was no particular variety that consistently produced the greatest yield. On the Coahoma County and Sharkey County sites, most hybrids yielded more seed than Peredovik, but the hybrids were highly variable. That is, in some years a particular hybrid did best, but the next year another hybrid performed better (*Figure 2, A–F*).

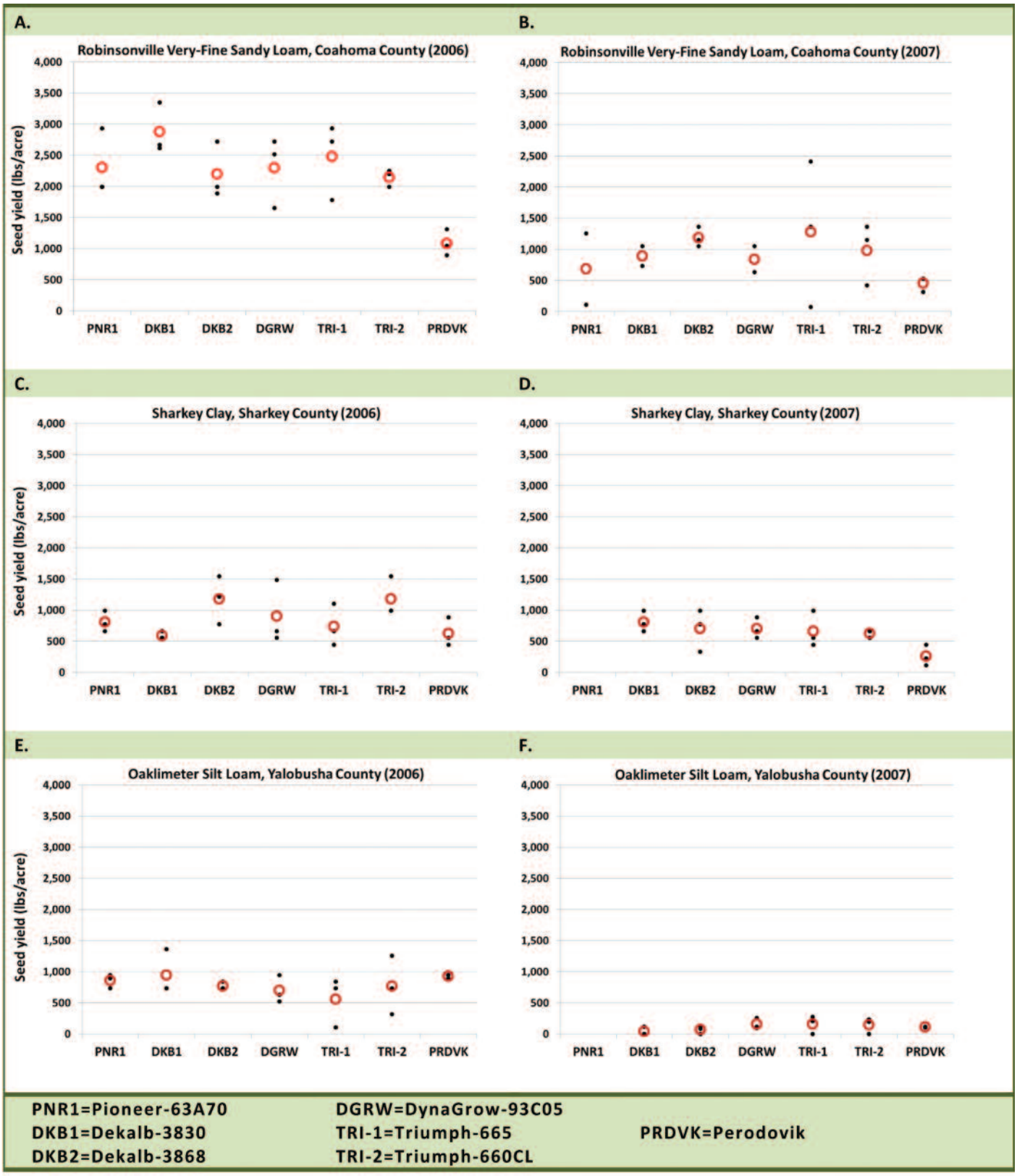


Figure 2

Comparison of sunflower seed yields from Peredovik and six black-oil hybrid sunflower varieties grown in three soil areas of Mississippi in 2006 and 2007.

Evaluation of Herbicide Systems

We evaluated the use of two different herbicide systems as a means of effectively controlling weeds in sunflower fields:

- A conventional system composed of a tank mix of metolachlor and sulfentrazone applied pre-emergence, followed by a post-emergence application of clethodim.
- A Clearfield system pairing the herbicide-resistant sunflower variety with a pre-emergence application of metolachlor, followed by a post-emergence application of imazamox.

Each system was evaluated according to seed yield and amount of bare ground among sunflower plants at maturity.

Table 2

Conventional and Clearfield herbicide systems for use in Southeastern sunflower plantings with herbicides and application rates as evaluated by USDA-Plant Materials Center and Mississippi State University Extension Service.

Herbicide and Rate		Application Information
Conventional Sunflowers		
Conventional Pre-emerge		
Dual Magnum	1.33–1.67 pt/ac	Apply at time of planting for control of annual grasses and small-seeded broadleaf weeds.
Spartan 4F	4.0–6.0 oz/ac	Apply at time of planting for annual broadleaf weeds. Can be tank mixed with Dual.
Conventional Post-emerge		
Select 2 EC[a]	8 oz/ac	For grass control, apply to 2- to 6-inch tall grasses.
Clearfield Sunflowers		
Conventional Pre-emerge		
Dual Magnum	1.33–1.67 pt/ac	Apply at time of planting for control of annual grasses and small-seeded broadleaf weeds.
Clearfield Post-emerge		
Beyond 1 AS[a]	5 oz/ac	For annual grasses and certain broadleaf weed control, apply at two- to eight-leaf stage. ***Apply to Clearfield sunflowers only.***

[a]Use 1 qt/ac crop oil concentrate.

Methods

- Pre-emerge herbicides were applied the same day as planting.
- Post-emerge herbicides were applied 2 to 4 weeks after sunflower emergence.
- Percent bare ground among sunflowers was quantified at maturity before harvesting sunflower heads.

Results

Herbicide use resulted in greater seed yields and percentages of bare ground among all treated sites (Figures 3 and 4). Fields treated via the conventional system averaged 85 percent of bare ground, whereas fields treated via the Clearfield system averaged 22 percent of bare ground (Figure 4). Furthermore, the Clearfield system did a poor job of controlling late-season broadleaf weeds such as volunteer soybeans and sickle pods. Thus, the benefits of the conventional herbicide system are twofold: First, on average, sunflower seed yield was greater than the Clearfield system and approximately twice the yield of untreated sunflower fields. Second, bare ground, which is critical for foraging doves and allows them to find seed more efficiently, was greater in fields treated via the conventional system.

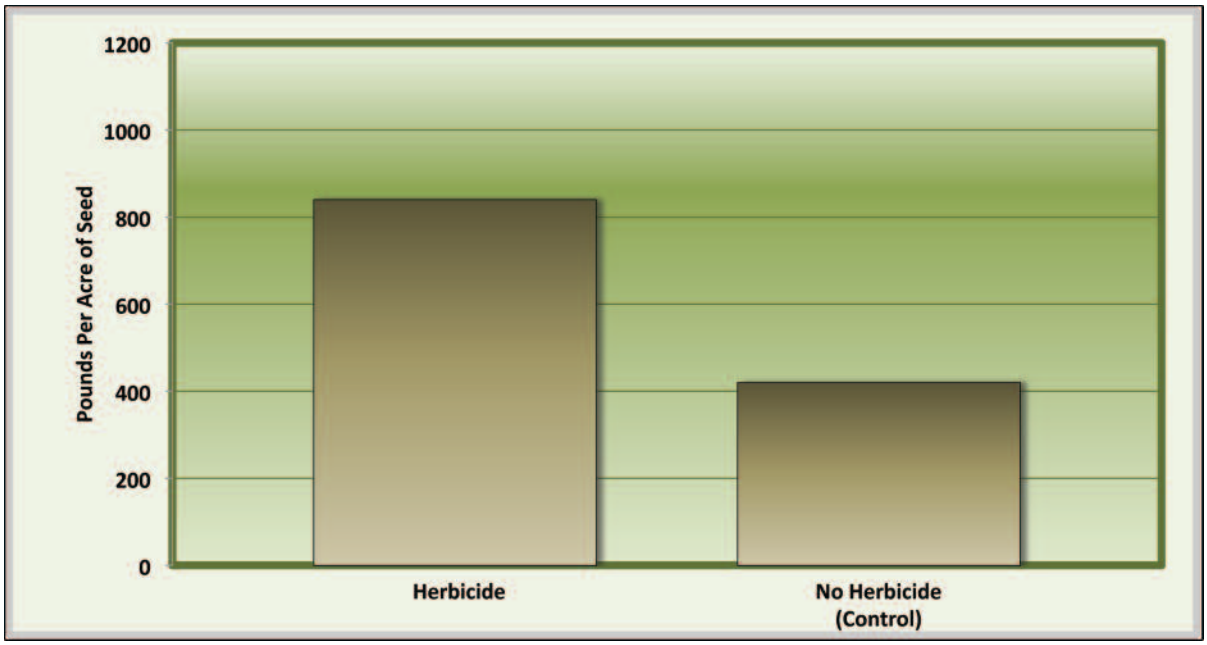


Figure 3
Comparison of seed yields from herbicide treated and untreated sunflower test plots.

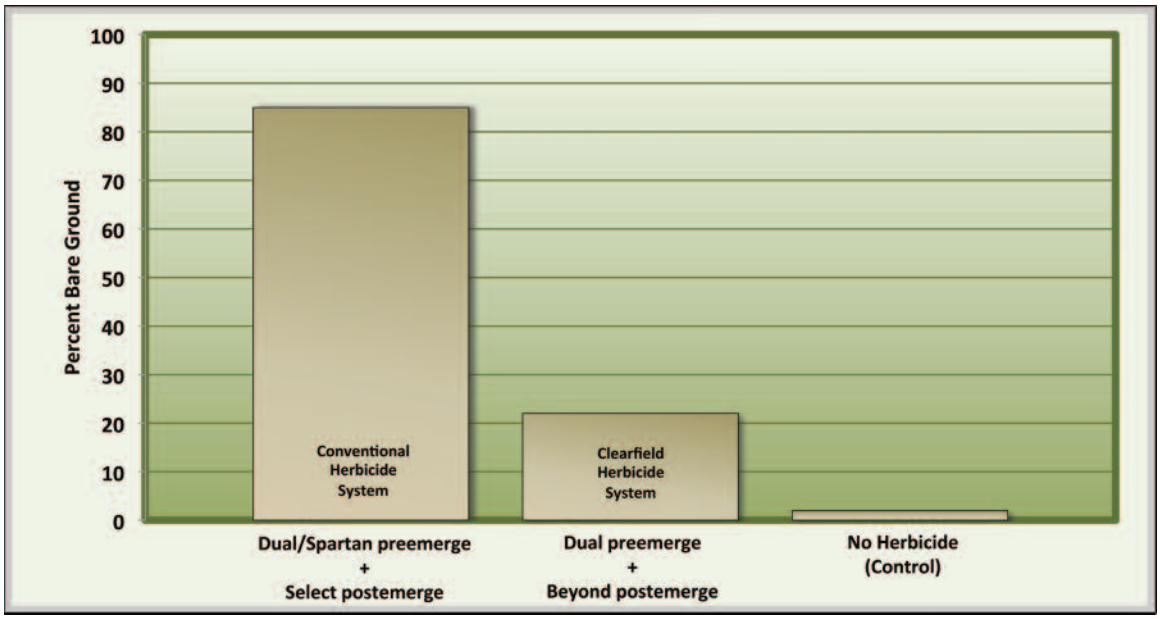


Figure 4
Percent bare ground as a result of two different herbicide systems (all sites are pooled).

Cost–Benefit of Hybrid Black-oil Varieties

Planting and managing sunflowers for dove hunting can be a costly enterprise. Use of hybrid varieties, herbicide weed control, and proper fertilization can improve seed yield, but landowners and wildlife managers must determine the economic cost relative to the benefit that hybrid sunflowers can provide as a dove field crop. Although black-oil hybrid sunflowers can be considerably more expensive to purchase than the Peredovik variety, most hybrids demonstrate greater seed yields in fertile soils, thus lowering their cost relative to seed yield. However, in soils with moderate or low fertility, or in less suitable soils with higher clay content, the Peredovik variety may be the most cost-effective option. *See Figure 5 for comparison of varietal yield and costs.*

Furthermore, greater seed yields will not necessarily attract more doves. The increase in seed yield may simply be a "diminishing returns" scenario in which a sufficient amount of sunflower seed is critical to attract and maintain doves at a particular field. Once this critical threshold of seed yield is surpassed, there may be no corresponding increase in the number of doves that use the field. Instead, what may be more important than actual seed yield are the requisite dove resources mentioned earlier—food, available water source, abundance of bare ground, adjacent loafing and roosting trees, etc. Thus, seed yield is only one variable in the equation for a successful dove field.

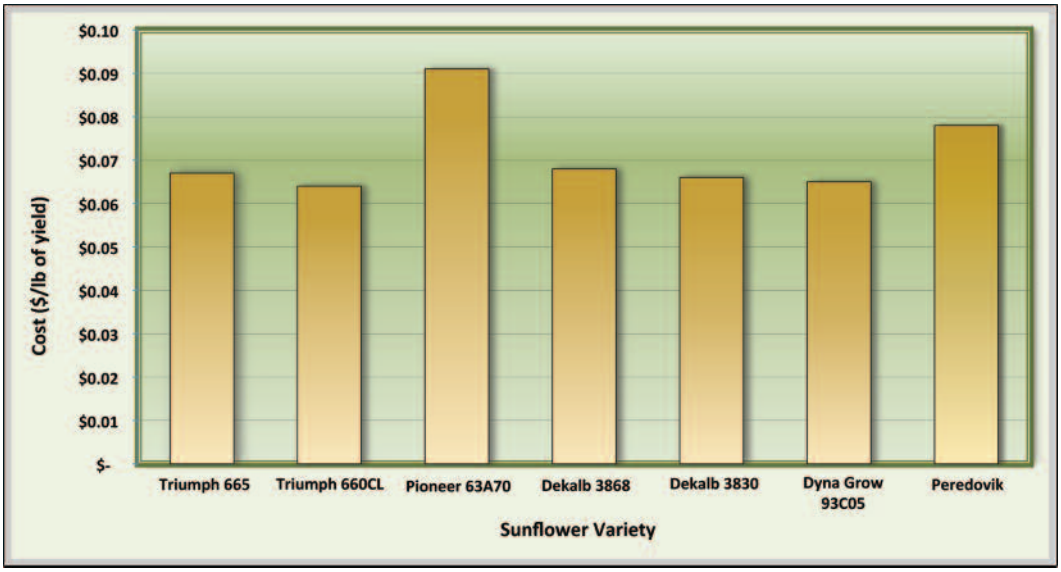


Figure 5
Cost comparisons per pound of yield for black-oil hybrid sunflowers and Peredovik sunflowers.

Conclusion

The bottom line is that black-oil hybrid sunflowers may attract more doves in some situations, and not in others. We recommend giving the new hybrids a try if you suspect sunflower seed yield is limiting the number of doves using a field, but our results clearly demonstrate that only in ideal soil conditions do hybrid sunflowers outperform the tried-and-true Peredovik variety.

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