



Planting Considerations for Sunflower in the Southern Great Plains

Chad Godsey, Greg Hohman, Randy Taylor, and Rick
Kochenower

Oklahoma State University

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Outline

- Plant Population
- Planting Date
- Stand Establishment



Objectives

- Determine the optimum plant population for the 2 possible production scenarios, early-season production and double-crop sunflower production (late-season).
- Evaluate the use of various planter attachments and planter adjustments to optimize plant establishment.

Methods – Plant Pop. and Date

- Plots were established near Stillwater and Lahoma, OK (rainfed).
- R859HOCL and s672 were used, a full season and early to mid season semi-dwarf hybrid, respectively.

Treatments	
Planting Date	Seeding Rate
	Seeds/ac
April 9	12,000
May 20	15,000
	18,000
June 15	21,000
July 24	24,000

Methods

- Randomized complete block with 4 replications.
- Plots were 10 ft wide and 25 ft in length and planted with a Monosem planter.
- Best management practices followed.
- Some planting dates were lost to severe bird damage and wet weather conditions. Sunflower growing conditions in Oklahoma during 2009 were not ideal.

Methods - Establishment

- Sunflower was no-till seeded into wheat stubble as a double crop.
- All plots were planted with a 4-row John Deere 7300 row crop planter with a vacuum metering system on 30 inch row spacing.
- Factors included:
 - residue clearing (with and without row cleaner)
 - seed firmer (with and without Keeton)
 - closing wheel type (standard Deere and standard Deere with one Martin spike)
 - speed (5 and 7 mph)
- Performance evaluation was based on percent emergence, emergence rate index (ERI), mean plant spacing, standard deviation in plant spacing, percent multiples, percent misses, quality of feed (QOF) index, precision index, and grain yield.
- This study had three replications and was implemented at two sites: a rainfed site in north central Oklahoma and an irrigated site in the Oklahoma panhandle.

Definitions

- percent emergence
- emergence rate index (ERI) = % per day
- mean plant spacing
- standard deviation in plant spacing
- percent multiples = <0.5 of target population
- percent misses = >1.5 times target spacing
- quality of feed (QOF) index
- precision index = std dev. after multiples and misses taken out, lower is better

Results – Planting Date

Effect of planting date on seed yield of 2 sunflower hybrids in Stillwater and Lahoma, OK.

Planting Date	Stillwater		Lahoma	
	R859HOCL	s672	R859HOCL	s672
	-----lb/ac-----			
9-Apr	1286	na [†]	na	na
20-May	1144	845	1296	1536
15-Jun	1036	1100	1415	1104
24-Jul	1340	978	na	na

[†]Plots were not harvested.

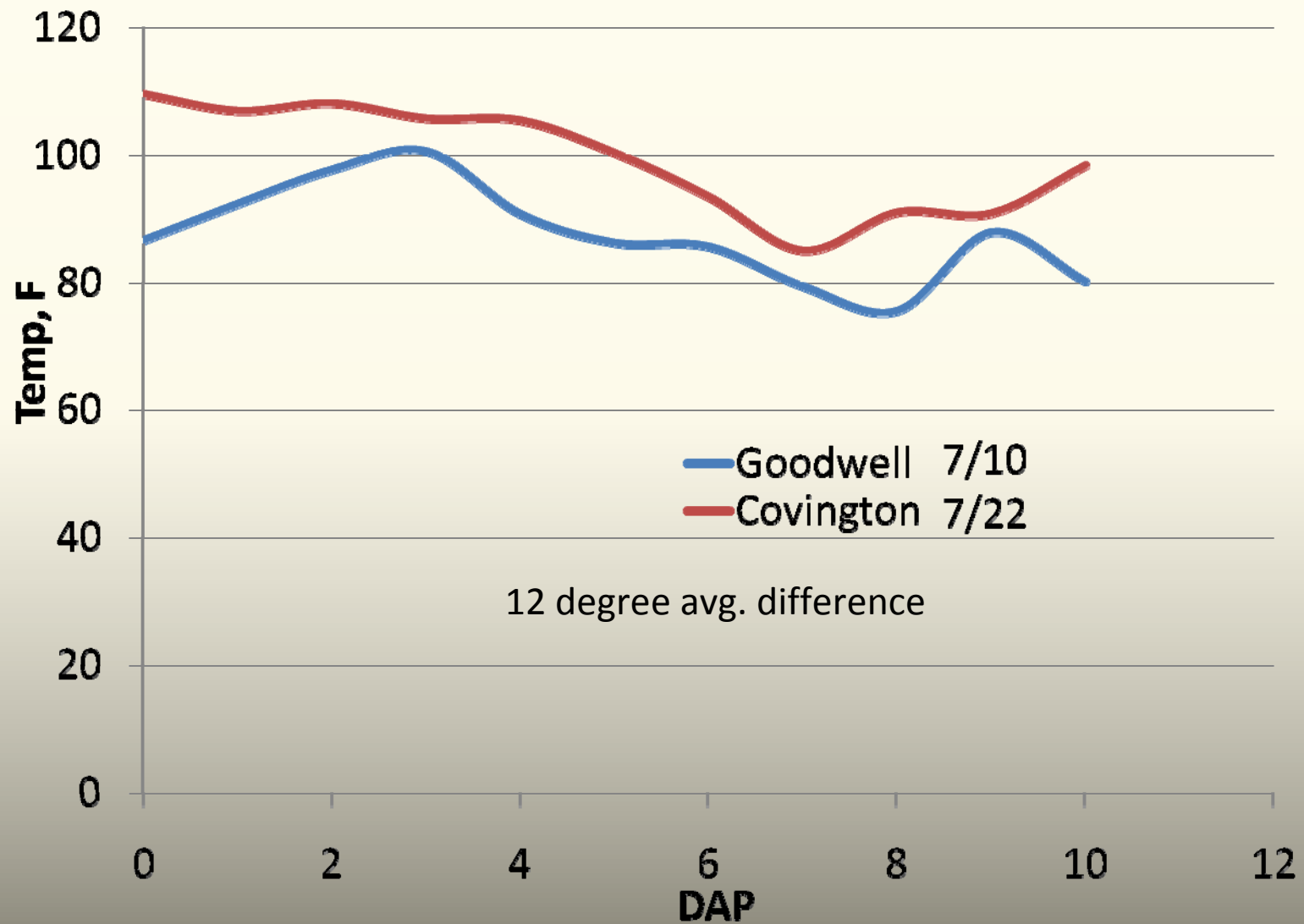
Results – Plant Population

Sunflower seed yield for the May 20 planting date for hybrid R859HOCL at Stillwater, OK.

Population	Seed Yield
---plants/ac---	---lb/ac---
12,000	905c
15,000	1100bc
18,000	1101b
21,000	1263ab
24,000	1350a



Maximum Temperature



Results – Stand Establishment

- Seed Firmer
 - No effect on evaluation parameters at the rainfed site.
 - The seed firmer resulted in significantly greater QOF at the irrigated site.
- Residue Managers
 - Residue clearing wheels resulted in significantly better precision (<deviation in plant spacing) at the rainfed site, but had a lower ERI.
 - At the irrigated site, residue cleaners resulted in greater emergence (6 points), lower standard deviation in plant spacing (0.7 in), fewer misses, higher QOF, but no difference in yield was detected.

Results – Stand Establishment

- Closing wheel
 - Using one spiked closing wheel resulted in significantly greater ERI and yield (128 lbs/ac) at the rainfed site, but had no significant effects at the irrigated site.
- Speed
 - Operating at lower speed (5 mph versus 7) resulted in better precision at the irrigated site while it resulted in greater emergence (6 points), fewer misses, higher QOF, and better precision at the irrigated site.

Results – Stand Establishment

- Trends at the rainfed site favor the use of a **seed firmer** and single **spike closing wheel**, operating without residue cleaners and a faster planting speed.
- Trends at the irrigated site favor the use of a **seed firmer**, a residue cleaner and single **spike closing wheel** and a slower planting speed.

Summary

- Planting Date
 - Early or late appears to be best. Late planting has opportunity to avoid heath moth problems.
- Plant Population
 - 18,000 to 20,000 plants/acre at harvest (>30" ann. Precip.)
- Stand Establishment
 - Seed firmer and spike closing wheel appear to be favorable for obtaining good stand, regardless of conditions.
 - Row cleaners are favorable when temperatures are cooler and soil moisture is available.

Acknowledgments

- National Sunflower Association