

Sunflower Special Topics: Recommended Practices in Row Spacing & Tillage for Sunflower

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TEXAS A&M
AGRILIFE
EXTENSION

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Sources of Label Information

- ⦿ Labels for herbicides, insecticides, fungicides, seed treatments, growth regulators, etc.—access through <http://www.cdms.net>, click ‘Label Database’ then ‘Search’ then conduct either of two searches:
 - ⦿ **A)** Enter product name then choose the specific product then its label or supplemental label (most common use)
 - ⦿ **B)** Click “Other Search Options” (register for a free password) to search by active ingredient (looking for a generic?), find a class of chemicals (herbicides, fungicides, insecticides) labeled for a particular crop, etc.

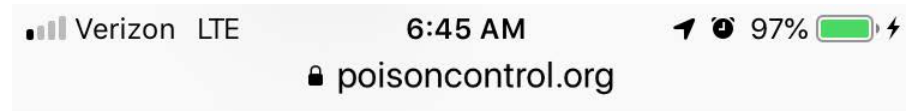
Texas Poison Center Network

⦿ <http://www.poisoncontrol.org>

⦿ (800) 222-1222

⦿ Put this in your
Cell Phone!

If you are blinded and can't see you can still voice dial (or call 9-1-1).



POISON CENTER NETWORK



**Texas South Plains:
Where will this land be
in another 20 Years?**





Lamesa, TX

November 26



September 24



- ◎ Biomass from sorghum/ sudan > 2 tons DM/acre
- ◎ Soil protection assured, but how to manage for subsequent planting?



April 15 the next spring.
Will this hold the ground?
Can a farmer plant in this?



MaxEmerge XR



Annual Class A Pan Evaporation (this is like the annual evaporation off a lake surface)

Bismarck, ND:
~47"/year

Akron, CO:
~73"/year,
but 11" less rainfall
than Bladen, NE

Red Cloud, NE:
~73"/year

Lubbock, TX:
~105"/year

Annual rainfall:

Bismarck, ND:	17"
Bladen, NE:	27"
Akron, CO:	16"
Lubbock, TX:	18"

525189 O-59 (Face Blank p. 14) No. 1

Plate 1. AVERAGE ANNUAL CLASS A PAN EVAPORATION IN INCHES (PERIOD 1946-1955)

Prepar
HYDROLOGIC INVES
HYDROLOGIC SEF
WEATHER
Washington, D.C.

Two Farming Considerations

- ⦿ The **planter** is your most important piece of equipment you own.
- ⦿ The **day you plant** is the most important day in the life of your crop.

NSA Field Survey, 2002

NSA Field Survey 2001.PDF - Adobe Acrobat Professional

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Table 2. Row spacing and tillage practices in each state in 2002.

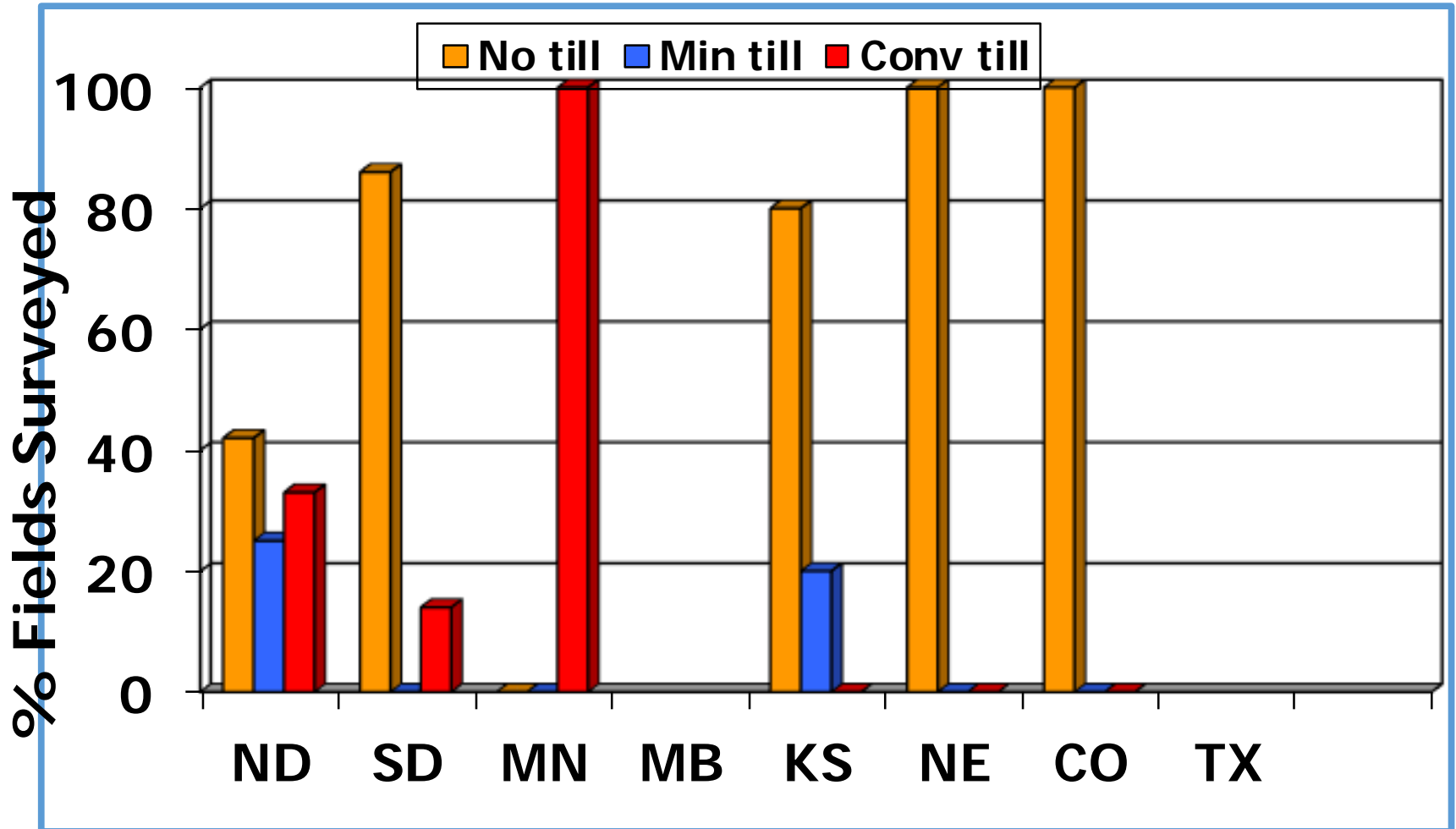
State	% Fields and Row Spacing		% Fields and Tillage Practices		
	< 20 Inches	>20 Inches	No Till	Minimum	Conventional
Colorado	5	95	32	58	10
Kansas	0	100	58	26	16
Minnesota	0	100	0	0	100
Missouri	0	100	0	100	0
Nebraska	0	100	17	75	8
North Dakota	30	70	11	27	62
South Dakota	15	85	50	33	17
Texas	100	0	8	0	92

6.82 x 2.42 in

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Tillage in Sunflower - 2019



NSA Field Survey, 2002

NSA Field Survey 2001.PDF - Adobe Acrobat Professional

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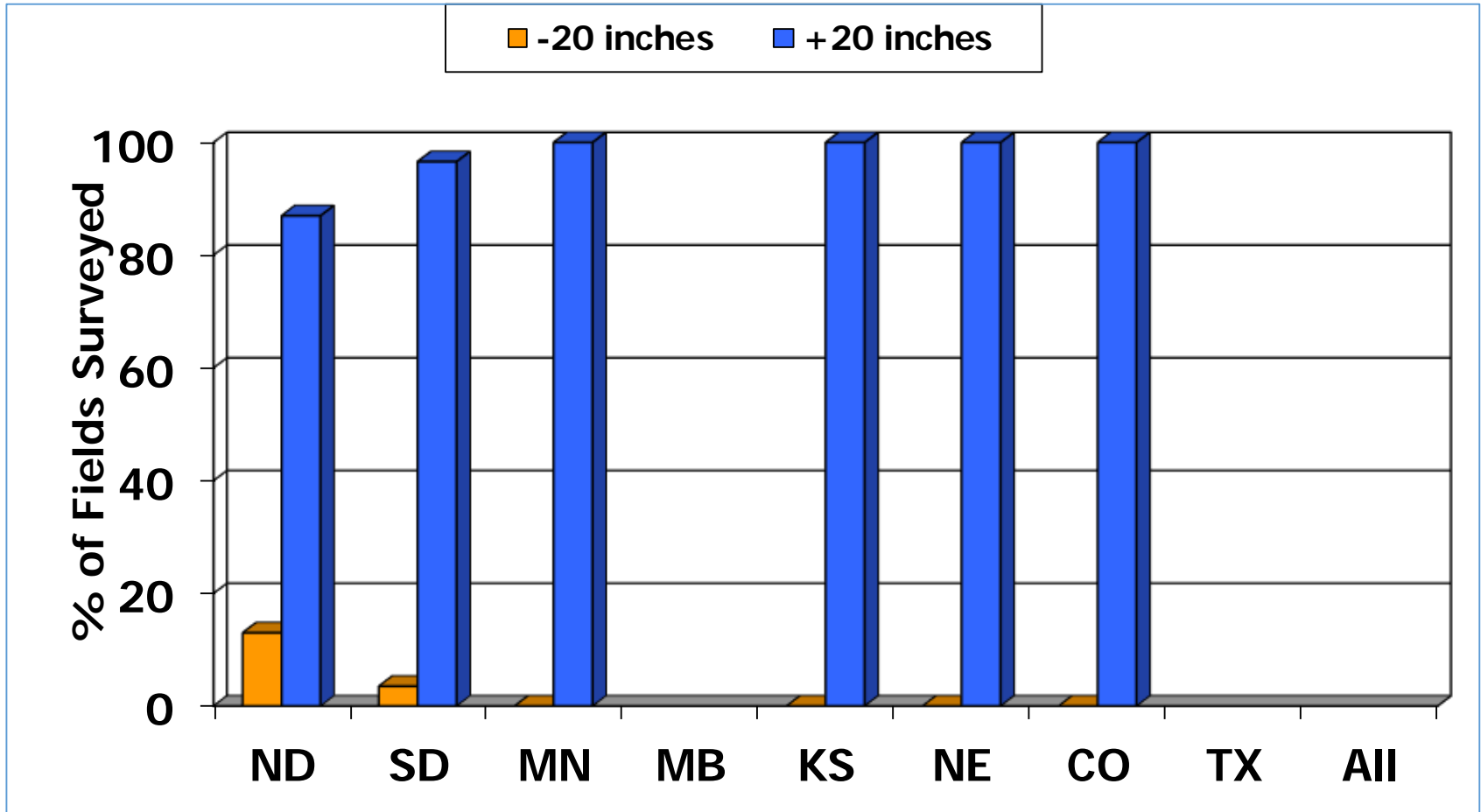
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Conventional Tillage & Seedbed Prep

- ⦿ Traditionally, for weed control & herbicide incorporation for planting.
- ⦿ In low rainfall areas, tillage must leave as much of the previous crop's residue intact as possible.
- ⦿ Avoid excessive tillage (soil structure damage, compaction, crusting, restrict water flow, etc.
- ⦿ Conventional tillage, <30% of residues left on surface; no-till, >60%.
- ⦿ Pre-emerge herbicide incorporation.



Minimum-Tillage Systems

- ⊙ Maintain surface residues (30-60% of soil surface coverage)
 - ⊙ **Precipitation:** “Catch it. Keep it. Reap it.”
- ⊙ Incorporate herbicides, possibly fertilizer.
- ⊙ Might use sweeps for undercutting.

Air-Drill Seeding

Starting Late 1990s

- ⊙ Solid seeding is now popular with producers in several regions.
- ⊙ Calibration of metering of seed.
- ⊙ Plant large acreages quickly.
- ⊙ Less seed placement control.



No-Till 1

- ⦿ Rely on rotation, burndown herbicides, PRE & POST herbicides for residual weed control, minimal soil disturbance as a part of weed control.
- ⦿ >60% of soil surface covered by previous crop residues.
- ⦿ May required residue managers (coulters, cutters, trash whippers, etc.).

No-Till 2

- ◎ **Strip tillage** may be used to prepare a seed zone, especially if soils are cold.
- ◎ Single-disc openers, narrow point hoe openers, etc.
- ◎ Minimize soil disturbance (soil health principle)
 - ◎ Contrary to what many of us believed years ago.
- ◎ Potentially better seed-soil contact with sufficient water for germination and establishment.
- ◎ “One-pass” operations.



1986-1995 Rainfed Oil Sunflower Yield in Crop Rotation for N & Tillage

Halvorson et al. (1995), Mandan, ND

N/A (lbs./A)	Conv Till	Min Till	No Till
30	1190	1260	1195
60	1245	1360	1270
90	1275	1370	1425
Avg.	1235	1330	1300

Sunflower & Tillage

Endres et al. (2009), Carrington, ND

Table 2. Sunflower performance with tillage systems, Carrington, 2007.

Tillage treatment	Plant emergence	Plant stand	R5.1	R9	Seed yield	Test weight	Seed oil
	Jday	plt/A	Jday	Jday	bu/A	lb/bu	%
Conventional	156	16601	215	267	1040	30.3	39.8
No-till	155	20747	214	267	956	30.4	40.8
Strip till - fall	156	17651	214	267	1086	30.0	40.0
Strip till - spring	156	18261	214	267	942	29.9	39.8
mean	156	18315	214	267	1006	30.2	40.1
CV (%)	0.3	22.8	0.3	0.0	12.1	1.2	2.4
LSD (0.05)	NS	NS	NS	NS	NS	NS	NS

Sunflower Yield & Root Growth, Strip Till vs. No-Till

Olson et al. (2006), Quinter, KS

Table 1. Tillage response for 2004 and 2005 are combined unless other wise noted.

Treatments	Test weight	Population (plants/A)		Lbs/A adj. 10.0% moisture
		2004	2005	
Winter strip-till	29.6	12900	18000	2225
Spring strip-till	28.9	15700	17500	2218
No-till	29.8	11200	16500	2008
Fall strip-till	29.4	13600	16800	1984
LSD (0.05)	NS	1064		167

Table 2. Spring strip-till and no-till root scores for 2004 and 2005.

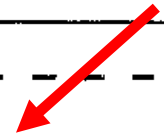
Tillage	Taproot Mass	Straight Taproot	Lateral roots	Secondary roots
Spring Strip-till	2.9	1.9	2.1	2.4
No-till	2.9	3.1	3.0	3.3
LSD (0.05)	NS	0.77	0.48	0.55

Tillage & Rooting Depth of Sunflower

Merrill et al. (2000), Mandan, ND

Depths of Root Growth

	Conv Till	Minim Till	No Till	Fallow
	----- Feet -----			
1992 Median	1.44	2.30	3.22	1.90
1993 Median	1.15	1.90	1.94	2.46
1992 Max	4.40	4.89	5.31	5.25
1993 Max	4.13	4.04	4.40	4.76





Row Spacing

- ⦿ Sunflower performs well in a wide range of plant populations & spacings.
- ⦿ When adequate weed control exists there is generally no yield difference between rows vs. solid seeded (<20”).







1996-1997 Rainfed Oil Sunflower Yield in Crop Rotation Due to Row Spacing

Halvorson (1999), Mandan, ND

Row Spacing (inches)	Yield (Lbs./A)	Test Wt. (Lbs./Bu)	%Oil
7.5	2315	32.0	42.1
15	2370	31.5	42.7
30	2075	31.8	42.7
LSD (0.05)	199	0.4	0.6

Let's Talk...

