

Seed Spacing Performance Of Common Row Crop Planters With Oil Seed Sunflowers

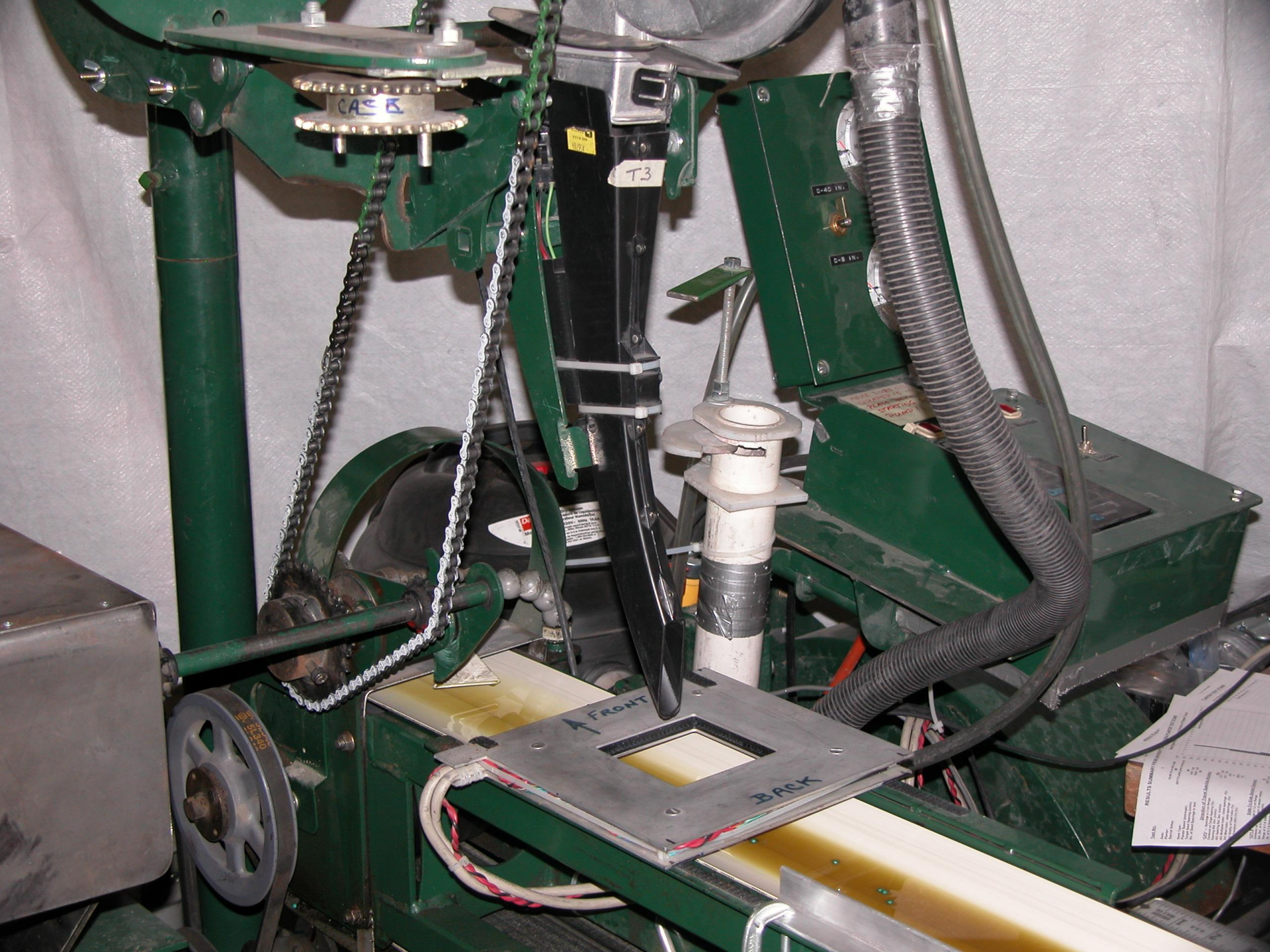


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2008 Project Objectives

- Examine seed spacing accuracy issues with common row crop planters using Oil Seed sunflowers
- Follow-up status of several “issues” found in 2007 study with large, narrow, confection seeds





CASE B

T3

0-40 IN.

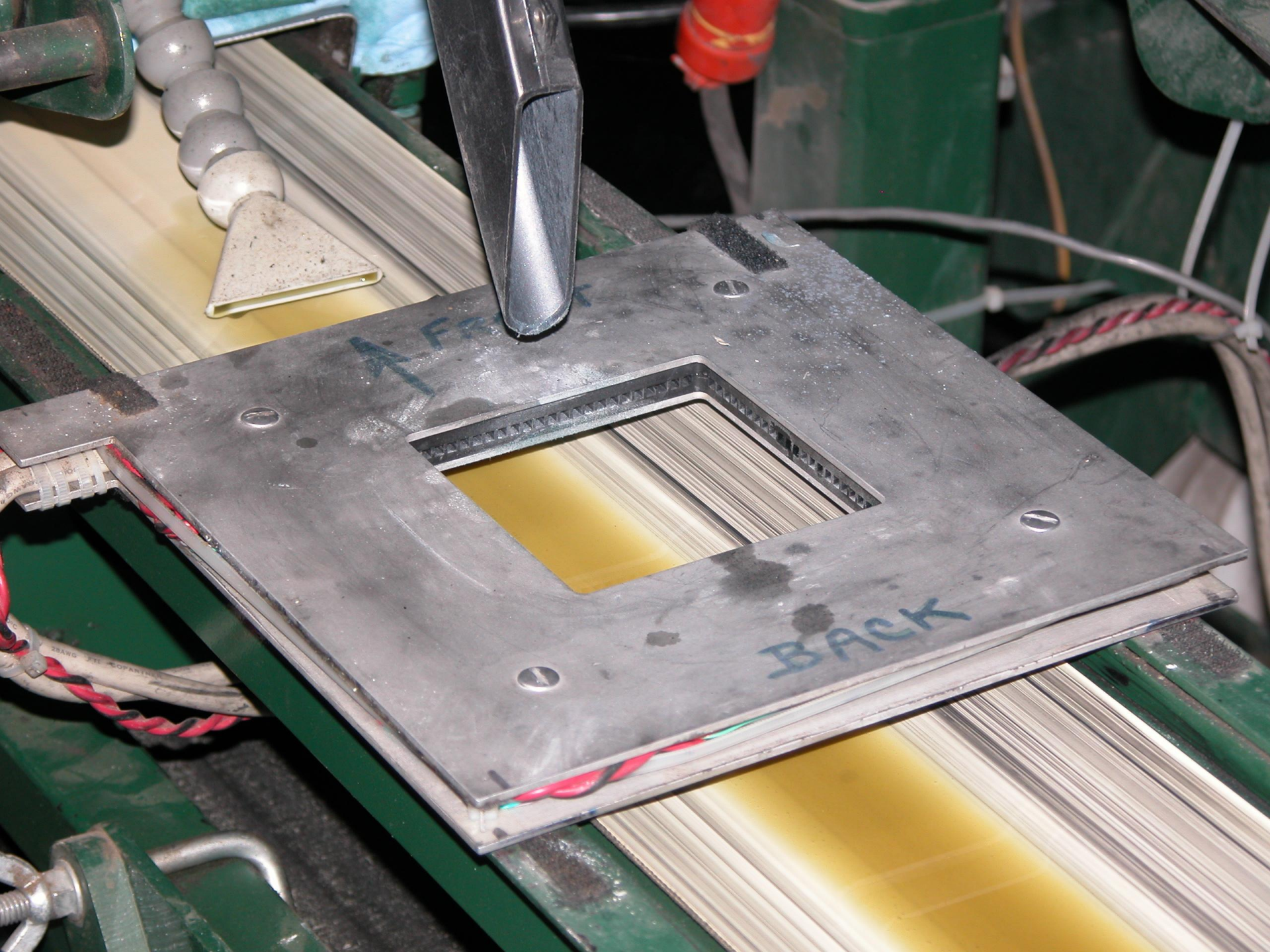
0-8 IN.

FRONT

BACK

RESULTS SUMMARY

Job No.	
Plant	
Product	
Operator	
Date	
Time	
Shift	
Machine	
Operator's Signature	
Supervisor's Signature	
Inspector's Signature	
Tester's Signature	
Tester's Name	
Tester's Title	
Tester's Department	
Tester's Phone No.	
Tester's Address	
Tester's City	
Tester's State	
Tester's Zip	
Tester's E-mail	
Tester's Fax	
Tester's Mobile	
Tester's Pager	
Tester's Home	
Tester's Work	
Tester's Cell	
Tester's Other	
Tester's Notes	



Testing Protocol

- 4 ½ mph --- unless noted
- 9 inch seed spacing
- 500 continuous seeds per replication
- 4 replications --- randomized!

Seed Spacing Accuracy Terms

- “CP3” = % of really good spacings --- between 8 ½ to 9 ½ in. (9 in. target)
- “Wide” spacings = % of spacings that are greater than 13 ½ in. --- Mostly ‘skips’.
- “Close” spacings = % of spacings that are less than 4 ½ in. --- mostly ‘doubles’.

Seed Spacing Accuracy Terms

- “CP3”: 90% looks ‘perfect’
70% still looks very good
40% looks irregular
- “Wide” spacings: Prefer below ~3-5%
- “Close” spacings: Prefer below ~3%

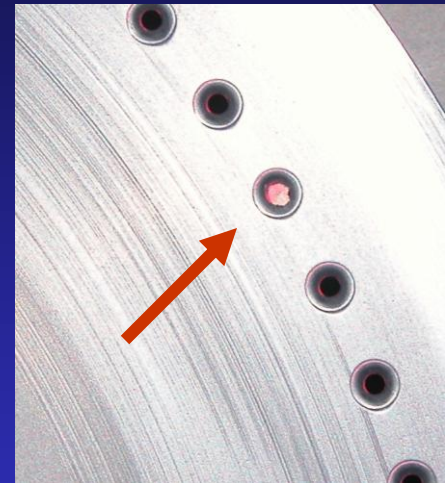
2007 Confection Seed “Issues”

1. Seed parts sticking in holes of CaseIH planter plates
2. Poor seed spacing with Deere MaxEmerge vacuum planter
3. Deere seed tube plugging
4. Unacceptable spacing with finger pickup

1. Seed parts sticking in holes of CaseIH planter plates

(Not considered a serious problem)

- CaseIH Engineers say they do not have a knockout and are not working on one, but are aware of occasional problem.
- Can't find another vendor.
- Watch plant population among rows on planter monitor very carefully.



2. Poor seed spacing with Deere MaxEmerge vacuum planter

- Use 20 cell instead of 40 cell flat plate



20 Cell vs. 40 Cell A52391 Flat Plate

(both at 4 ½ mph, 8 in. vacuum, ½ hole covered)

No. of Holes	Vac (in.)	Hole Closed	CP3 (%)	Close (%)	Wide (%)
20	8	½	48	7	1
40	8	½	42	8	3
		<i>sig. diff.?</i>	<i>yes</i>	<i>no</i>	<i>no</i>

2. Poor seed spacing with Deere MaxEmerge vacuum planter

- Try Precision Planting plate and accessory option.
- Get a planter monitor that has individual seed spacing accuracy capabilities.
 - Precision Planting 20/20 SeedSense monitor
- How else will you know in the field that you have the correct vacuum setting as you plant --- or have another problem with individual seed spacing?

3. Deere seed tube plugging

- Happens only with the long, narrow, confection seeds $\frac{3}{4}$ in. and longer.
- Planter monitor won't catch this unless the seed tube completely plugs --- and it probably will not!
- Need a wider seed tube.
- Deere has one, Kinze has one.







**DEERE
CLEAR
TUBE**



**DEERE
WIDE
TUBE**



**KINZE
WIDE
TUBE**

Wide Seed Tubes For Deere Planter?

(All at 4 ½ mph, A52390 20 cell plate, 8 in. vacuum)

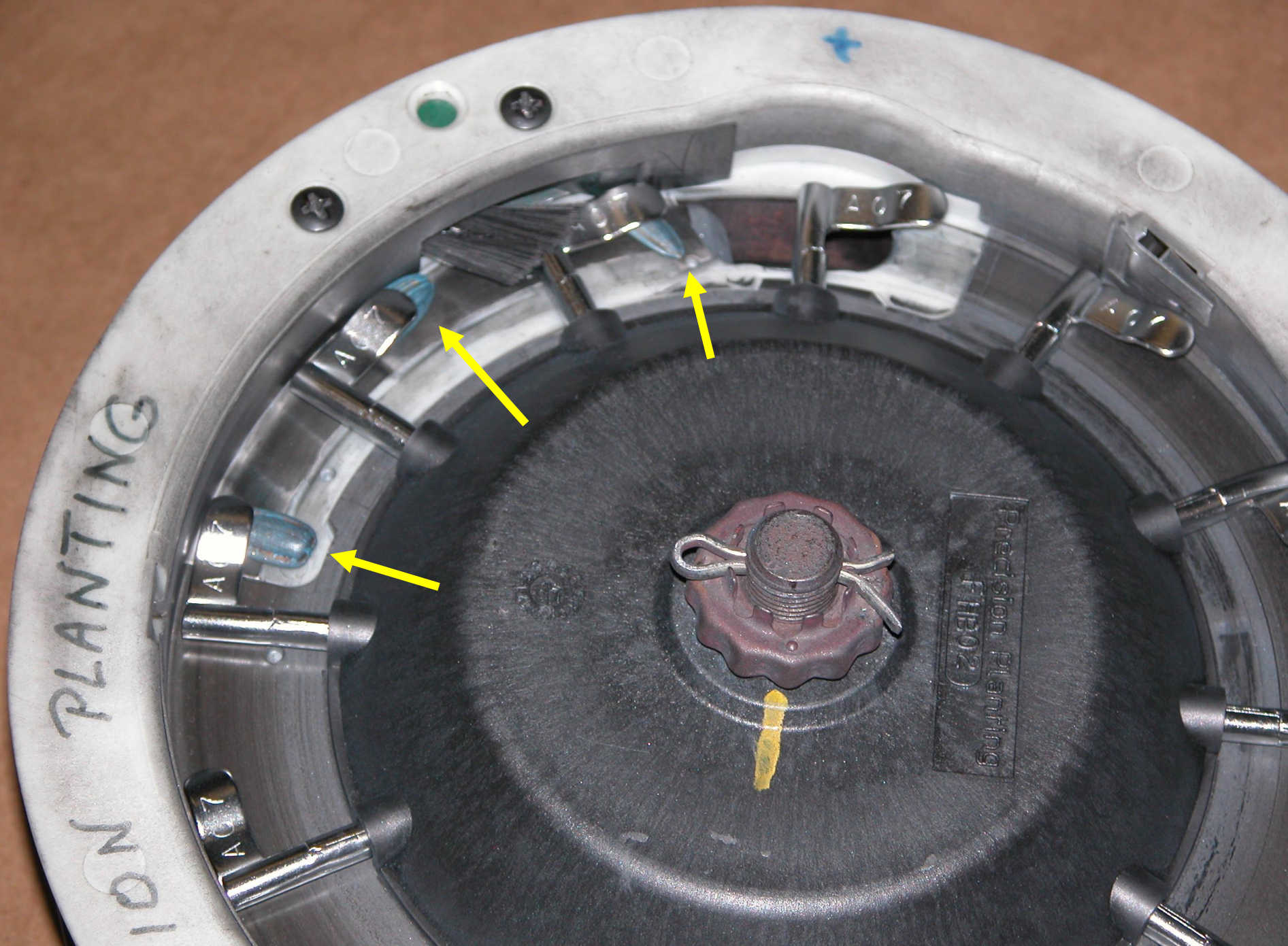
Tube Description	CP3 (%)	Close (%)	Wide (%)
Std. Deere Clear Tube A84520	55	6	2
Kinze Wide Tube GA12636	60	4	2
Wide Deere Tube A56786	48	7	2
<i>Isd (p=0.05):</i>	3	2	<i>n.s.</i>

3. Deere seed tube plugging

- Will these two wide seed tubes ever plug with the very long, narrow confection seeds?
 - We ran the standard Deere tube long enough to plug 3 times (about 10,000 seeds)
 - Neither the wide Deere tube or wide Kinze tube plugged with the same number of seeds.
 - I can't say 'never', but both are much better than regular Deere seed tube.

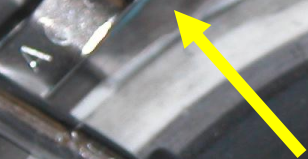
4. Unacceptable Spacing With Finger Pickup

- From my trials, the finger pickup is not an acceptable planter for quality confection sunflowers.
 - Precision Planting fingers and backing plate helped.
 - Use large exit hole in backing plate



ION PLANTING

Precision Planting
FIBO2



Seed Spacing Accuracy Issues Using Oil Seed Sunflowers In Common Row Crop Planters

- 3 planters: CaseIH 1200 series
Deere MaxEmerge Vacuum
Deere Finger Pickup
- **Size #4** oil seed was tested unless noted.

Variables Tested With Oil Seeds With Each Planter Model

1. Effect of field speed --- 3, 4 ½, 6 mph
2. Best plate selection
3. Effect of Cruiser
4. Sensitivity to vacuum adjustment
5. Sensitivity to singulator setting (Case)
6. With and without graphite and talc on seed
7. Effect of seed size change
8. Best settings for each seed size



**CASE
2423**

**CASE
2440**

#5

**CASE
2455**

CaseIH Plate Comparison

(All at 4 ½ mph with #4 oil seed)

Plate No.	Vac (in.)	Sing	CP3 (%)	Close (%)	Wide (%)
2423	26	#3	59	2	4
2440	18	#1	50	4	3
2455	<i>(Plate hole too large --- seed goes thru or sticks in hole!)</i>				
		<i>Sig. Diff.?:</i>	yes	yes	no

CaseIH Sensitivity To Field Speed

(All with #4 oil seed & 2423 plate)

Speed (mph)	Vac (in.)	Sing	CP3 (%)	Close (%)	Wide (%)
3	26	#3	69	3	1
4 1/2	26	#3	60	3	4
6	26	#3	48	1	8
		<i>Lsd (0.05):</i>	3	1	4

Be Careful With Field Speed!!



2

CaseIH Sensitivity To Singulator Setting

(All with #4 oil seed & 2423 plate)

Speed (mph)	Vac (in.)	Sing	CP3 (%)	Close (%)	Wide (%)
4 ½	26	#1	63	1	6
4 ½	26	#2	61	2	2
4 ½	26	#3	59	5	2
<i>Lsd (p = 0.05):</i>			3	1	2

Singulator Must Be Set Correctly!!

CaseIH Sensitivity To Vacuum Setting

(All with #4 oil seed & 2423 plate)

Vac. (in.)	Speed (mph)	Sing	CP3 (%)	Close (%)	Wide (%)
23	4 ½	#3	63	2	5
26	4 ½	#3	64	2	3
29	4 ½	#3	65	2	2
<i>Lsd (p = 0.05):</i>			<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>

Vacuum setting is relatively insensitive.



#4



#2



#3



#5



**#2
PRO**

CaseIH Sensitivity To Seed Size

(All at 4 ½ mph, 2423 plate, set for #4 oil seed)

Oil Seed Size	Vac (in.)	Sing	CP3 (%)	Close (%)	Wide (%)
#2	26	#3	46	1	31
#3	26	#3	62	0	18
#4	26	#3	65	2	4
#5	26	#3	72	1	3
		<i>Lsd (0.05):</i>	3	1	3

Something Must Change When You Change Seed Size!!



CaseIH “Worn” Seed Tube

(both with #4 oil seed at 4 ½ mph, 2423 plate)

Seed Tube	Vac (in.)	Sing	CP3 (%)	Close (%)	Wide (%)
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New	26	#3	64	2	3
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“Worn”	26	#3	41	6	4
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		<i>Sig. Diff?</i>	yes	yes	no
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Replace “Worn” Seed Tubes!!!



#4
WITH
CRUISER



#4
NO
CRUISER

Caselh With & Without Cruiser On Seed

(both with #4 oil seed at 4 ½ mph, 2423 plate)

Cruiser?	Vac (in.)	Sing	CP3 (%)	Close (%)	Wide (%)
Yes	26	#3	61	2	4
No	26	#3	61	2	3
		<i>Sig. Diff?</i>	<i>no</i>	<i>no</i>	<i>no</i>

Cruiser on seed did not make a difference in seed spacing accuracy in this situation.



#4
WITH
TALC &
GRAPHITE

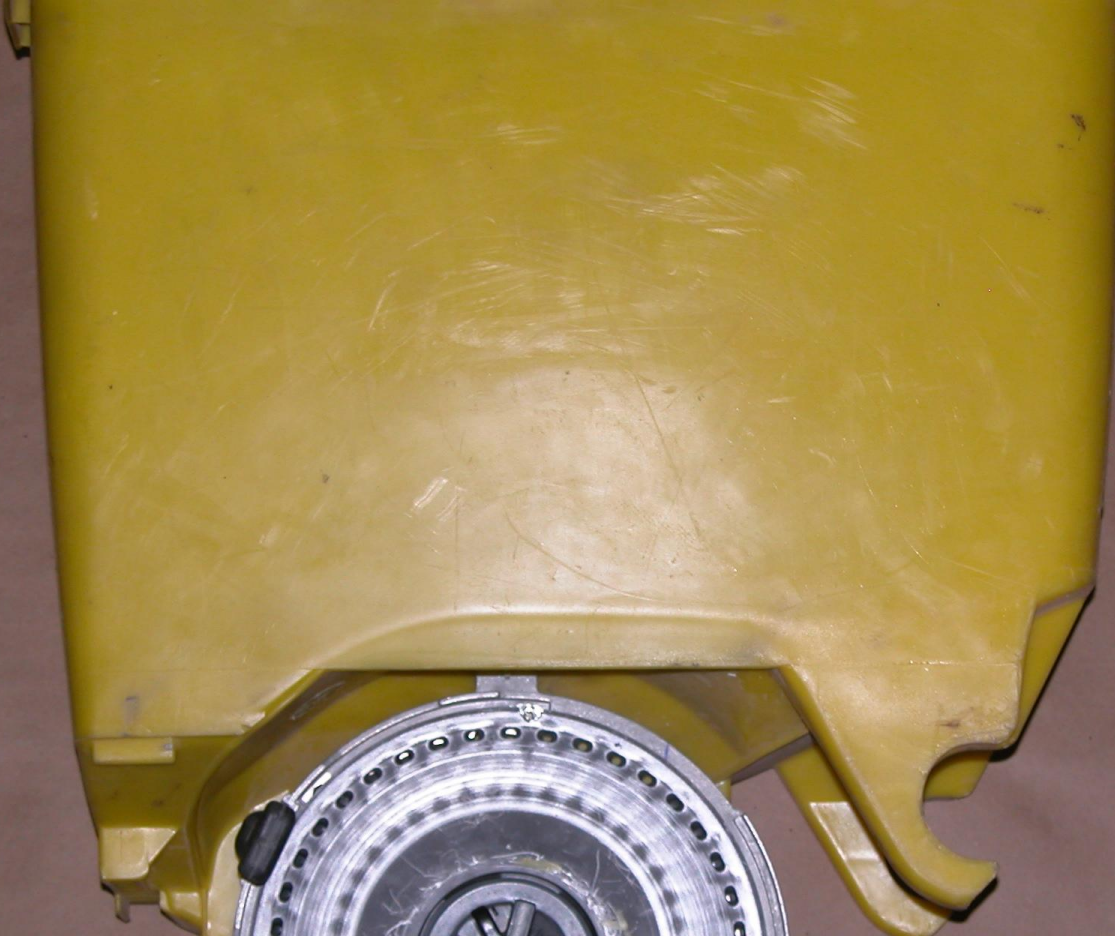
#4
NO
TALC &
GRAPHITE

CaseIH With & Without Talc & Graphite

(both with #4 oil seed at 4 ½ mph, 2423 plate)

With both Talc & Graphite?	Vac (in.)	Sing #3	CP3 (%)	Close (%)	Wide (%)
Yes	26	#3	67	2	3
No	26	#3	63	3	4
		<i>Sig. Diff?</i>	<i>yes</i>	<i>no</i>	<i>no</i>

Use a mix of graphite and talc to help lubrication of planter parts and for seed “flow” in planter.



452577

UNL
7N1
6 R 11M



DEERE
H136478



40 CELL
DEERE
A52391



40 CELL
DEERE
A52390

Deere Vacuum Cell Plate vs. Flat Plate

(All at 4 ½ mph, #4 oil seed)

Plate Description	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
Cell Plate H136478	3 ½	54	6	6
Flat Plate A52390 (40 Cell)	3	49	3	4
Flat Plate A52391 (40 Cell)	Plate hole too large, seeds plug			
	<i>Sig. Diff.?:</i>	yes	yes	yes

Top two plates could work but flat plate has more options to reduce doubles and skips by changing the 'doubles eliminator'.

Deere Vacuum Planter Vs. Field Speed

(All with #4 oil seed & H136478 cell plate)

Speed (mph)	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
3	3 ½	62	8	4
4 ½	3 ½	55	7	6
6	3 ½	42	5	11
<i>Lsd (0.05):</i>		3	1	1

Be Careful With Field Speed!!

Deere Vacuum Sensitivity To Vacuum

(All with #4 oil seed & H136478 plate)

Vac. (in.)	Speed (mph)	CP3 (%)	Close (%)	Wide (%)
2 ½	4 ½	52	4	14
3 ½	4 ½	54	6	7
4 ½	4 ½	52	10	2
<i>Lsd (p = 0.05):</i>		1	2	1

Vacuum setting is important for skips & doubles.



Deere “Worn” Seed Tube

(both with #4 oil seed at 4 ½ mph, H136478 cell plate)

Seed Tube	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
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New	3 ½	52	7	7
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“Worn”	3 ½	38	11	7
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<i>Sig. Diff?</i>		yes	yes	no
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Replace “Worn” Seed Tubes!!!

Deere With & Without Cruiser On Seed

(both with #4 oil seed at 4 ½ mph, H136478 cell plate)

Cruiser?	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
Yes	3 ½	57	6	6
No	3 ½	56	7	2
	<i>Sig. Diff?</i>	<i>no</i>	<i>no</i>	<i>no</i>


Cruiser on seed did not make a difference in seed spacing accuracy in this situation.

Deere With & Without Talc & Graphite


(both with #4 oil seed at 4 ½ mph, H136478 cell plate)

With both Talc & Graphite?	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
Yes	3 ½	56	6	6
No	3 ½	46	5	16
	<i>Sig. Diff?</i>	<i>yes</i>	<i>no</i>	<i>yes</i>

Use a mix of graphite and talc to help lubrication of planter parts and for seed “flow” in planter.

A black metal disc with a serrated edge and a central mounting hole. The disc is shown from a top-down perspective.

**40 CELL
DEERE
A52391**

A black metal disc with a serrated edge and a central mounting hole. The disc is shown from a top-down perspective.

**40 CELL
DEERE
A52390**

A light-colored metal disc with a serrated edge and a central mounting hole. The disc is shown from a top-down perspective.

**PRECISION
7200032**

A light-colored metal disc with a serrated edge and a central mounting hole. The disc is shown from a top-down perspective.

**PRECISION
7200031**

Deere cell Plate vs. Precision Planting Plates

(All at 4 ½ mph, #4 oil seed)

Plate Description	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
Deere Cell H136478	3 ½	56	7	7
Precision Planting P7200031	6	69	1	1
Precision Planting P7200032	4	72	1	2
	<i>Lsd (0.05):</i>	2	1	1



#4



#2



#3



#5



**#2
PRO**

Deere Vacuum Planter Sensitivity To Seed Size

(All at 4 ½ mph, H136478 cell plate, set for #4)

Oil Seed Size	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
#2	3 ½	34	1	31
#2 'Pellet'	3 ½	46	0	36
#3	3 ½	52	1	24
#4	3 ½	54	7	6
#5	3 ½	63	3	0
	<i>Lsd (0.05):</i>	3	1	2

Something Must Change When You Change Seed Size!!

Deere Vacuum Planter Seed Size Best Settings

(All at 4 ½ mph)

Oil Seed Size	Plate	Vac (in.)	CP3 (%)	Close (%)	Wide (%)
#2	A52390	5	55	3	3
#2 'Pellet'	H136478	15	67	1	0
#3	A52390	6	56	1	0
#4	H136478	3 ½	56	7	5
#5	H136478	3	61	4	0
<i>Lsd (0.05):</i>			3	1	1

Something Must Change When You Change Seed Size!!



PRECISION
SHORT
FINGERS

DEERE
SHORT
FINGERS

DEERE
LONG
FINGERS

Deere Finger Pickup Planter --- Options Vs. #3 & #4 (All at 4 ½ mph)

Oil Seed		CP3	Close	Wide
Size	Finger Options	(%)	(%)	(%)
#3	J.D. Short Finger	50	1	9
#4	J.D. Short Finger	39	4	22
#3	J.D. Long Finger	49	14	8
#4	J.D. Long Finger	24	12	36
#3	P.P. Short Finger	64	0	8
#4	P.P. Short Finger	54	2	13
	<i>Lsd (0.05):</i>	4	3	2

Deere Finger Planter Vs. Field Speed

(All with #4 oil seed & Precision Planting parts)

Speed (mph)	CP3 (%)	Close (%)	Wide (%)	
3	35	1	12	
4 ½	55	2	12	
6	50	3	6	
<i>Lsd (0.05):</i>		4	1	<i>n.s.</i>

Be Careful With Field Speed!!

Deere Finger Planter With & Without Talc + Graphite

(both with #4 oil seed with Cruiser at 4 ½ mph,)

With both Talc & Graphite?	CP3 (%)	Close (%)	Wide (%)
Yes	56	1	9
No	53	1	8
	<i>Sig. Diff?</i>	yes	No

Use a mix of graphite and talc to help lubrication of planter parts and for seed “flow” in planter.

Planter Seed Spacing Accuracy Performance With Oil Seeds

- **CaseIH --- Excellent**
- **Deere Vacuum --- Good**
- **Deere Finger Pickup --- Questionable**

What is the Number 1 'Thing' that Would Improve Sunflower Planter Seed Spacing Performance?

- A planter monitor that will provide the operator with seed spacing information between **individual seeds** --- like the data you have seen!
 - Precision Planting “20/20 SeedSense” monitor is only example I know of.
- How else will you know if you have the correct settings or if something has gone wrong in the field with individual seed spacing?

Thank You For Your Support!

