

Manage Canola Inputs

**Canola Seeding Rate, Row
Spacing, Singulation and
Direct Harvest**



UNIVERSITY OF MINNESOTA

Seeding Rate and Row Spacing



Canola Row Spacing

Advantages/Disadvantages

Narrow Rows

- More uniform plant distribution
- Less plant to plant competition
- Better utilization of moisture, light and nutrients
- Quicker canopy closure
- Improved competition with weeds

Wide Rows

- Better residue clearance
- Less soil disturbance
- More intra plant competition
- Better able to emerge in crusted soil
- Delayed row closure
- Reduced competition with weeds



Research Objective

- **Investigate optimum row spacing and seeding rate to determine what combination provides the greatest return/acre in canola production**



Research Methods - Small Plot

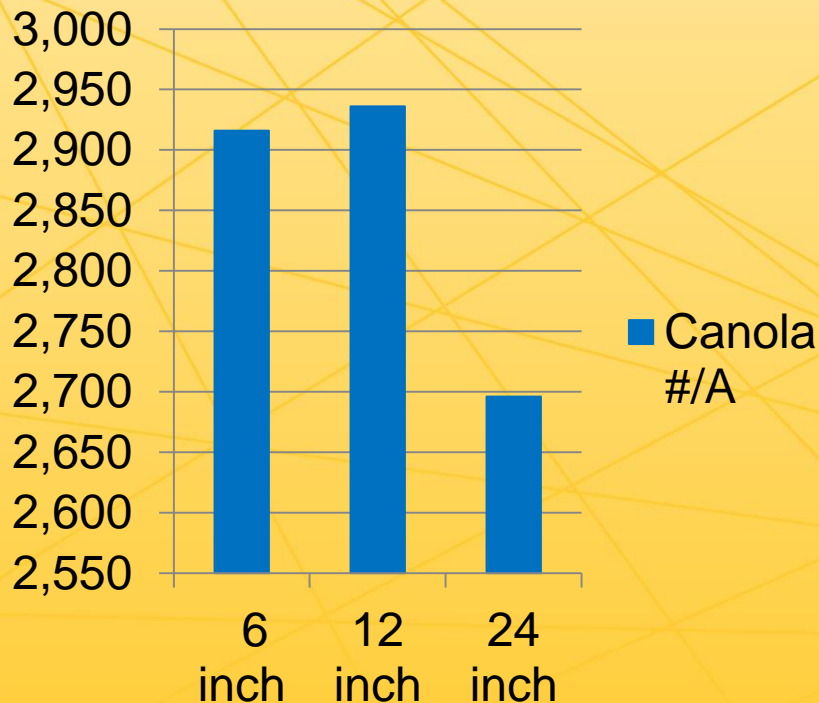
- **CPC 2015-2017**
- **Row spacing: 6, 12 & 24 inches**
- **Seeding rate: 3, 6, 9 & 12 PLS/square foot**
- **RCBD with 4 reps**
- **Conventional tillage**
- **InVigor L252, L140P**
- **Small plot equipment**



Canola Yields (2015-2017) Averaged Row Spacing and Plant Population

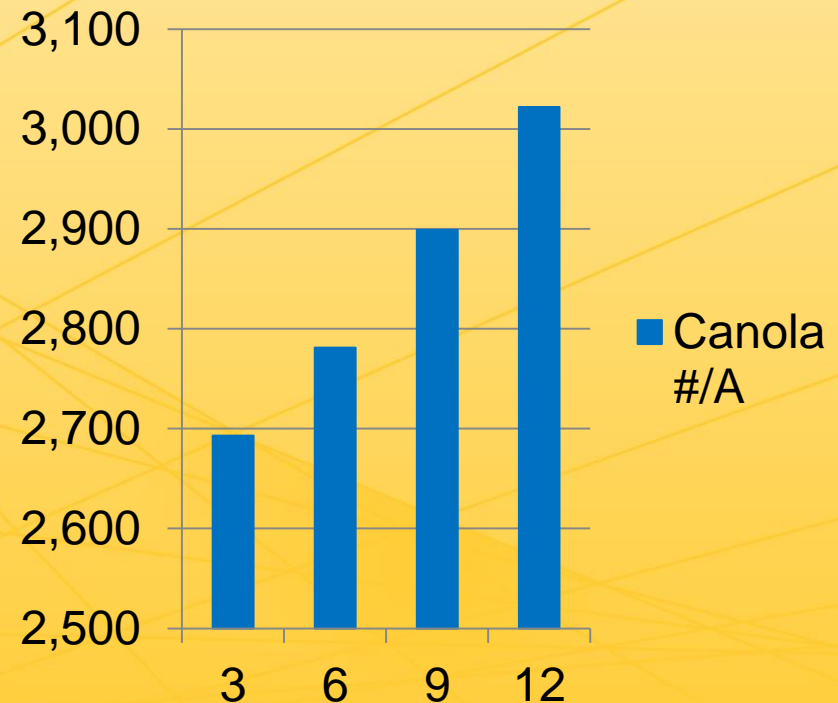
Row Spacing

Canola #/A



Seeding Rate

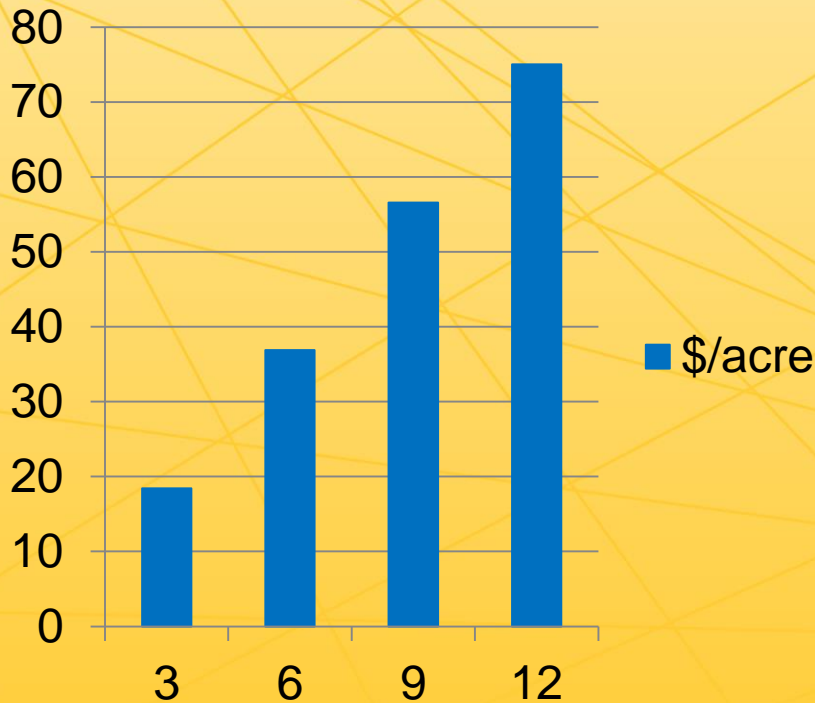
Canola #/A



Canola Seed Costs (12.3/#) and Net Return/acre (0.18#)

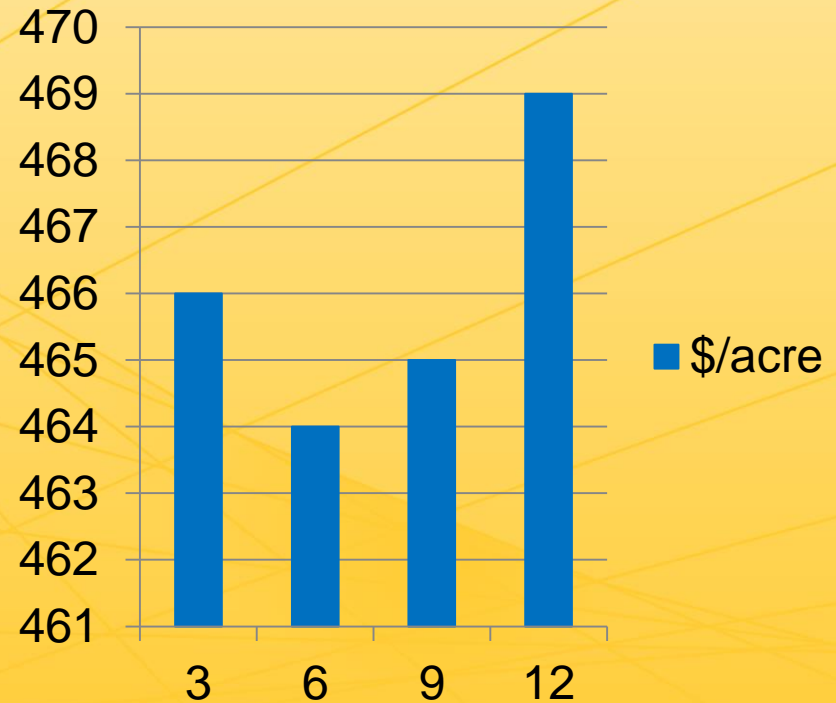
Canola Seed Cost

\$/acre



Net Return/acre

\$/acre

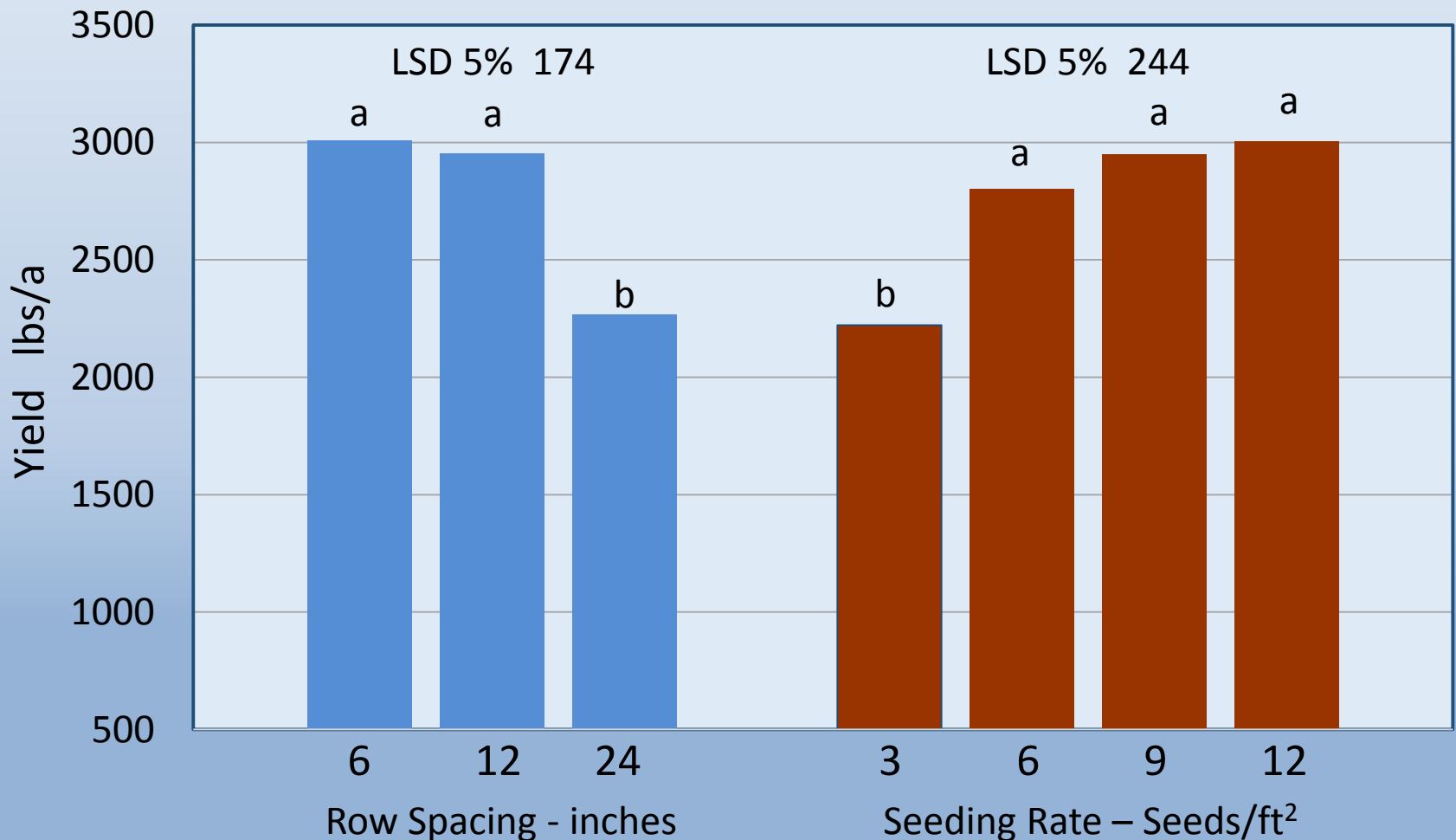


Row Spacing/Seeding Rate Trial Summary

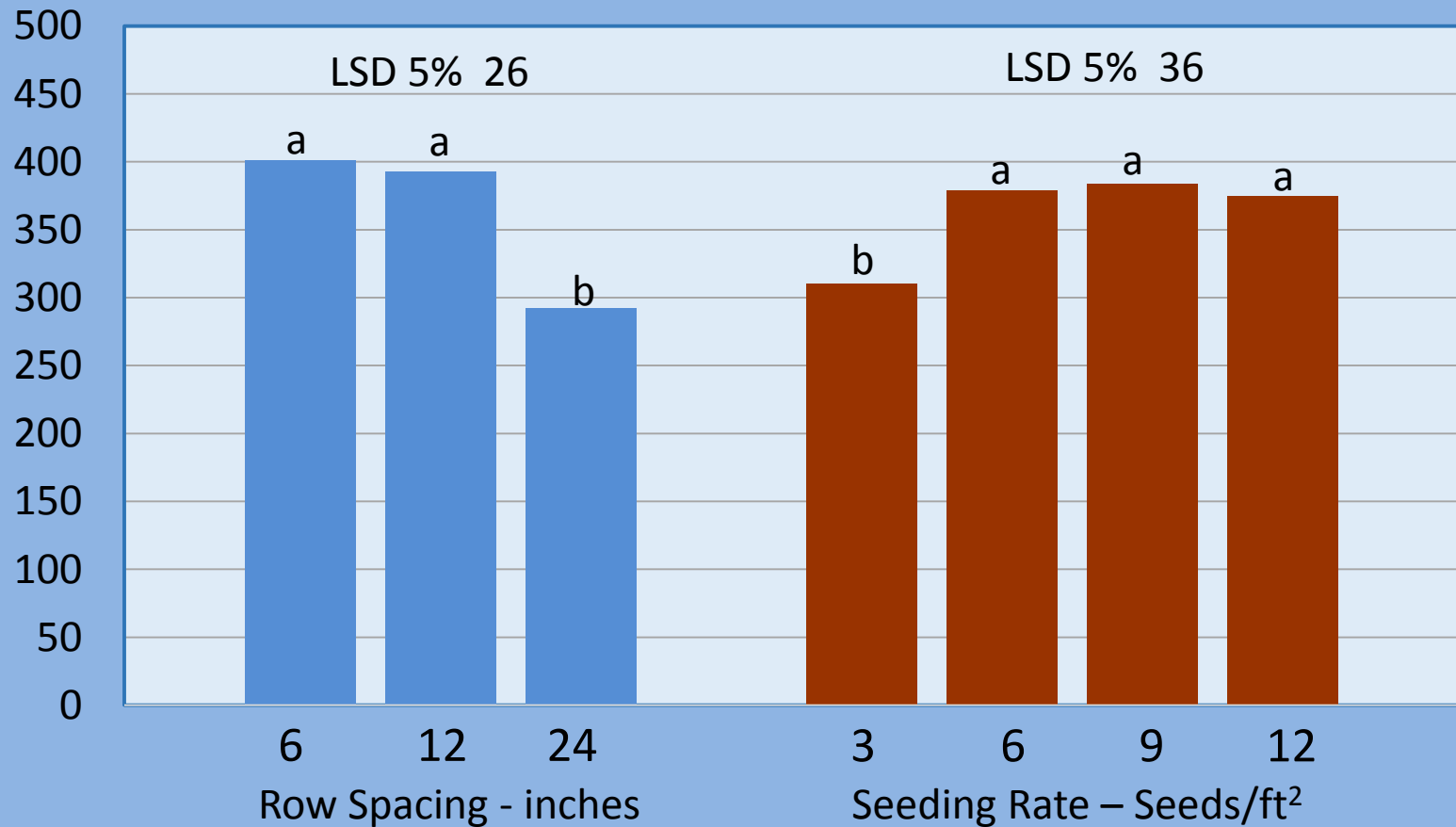
- **Effect of row width and seeding rate on agronomic traits e.g. days to first flower, maturity, plant height, oil and lodging small differences highly variable**
- **Optimum combination of row width and seeding rate for yield was 12 inches at 12 plants/square foot.**



Canola yield at three row spacings averaged across four seeding rates and four seeding rates averaged across three row spacings at Langdon, 2016.



Canola Net Return \$/acre at three row spacings averaged across four seeding rates and four seeding rates averaged across three row spacings at Langdon, 2016.



Conclusions

- Canola in crusted soils in 24 inch row spacing may have improved emergence due to neighboring plants aiding each other in breaking the crust while in non-crusted soils emergence could be reduced from self thinning due to increased plant competition.
- At Langdon, the optimum combination of row spacing and seeding rate for Net Return \$/acre was seeding in a 6 or 12 inch row spacing at a seeding rate of 6 or 9 seeds/ft².
- At Prosper, the optimum combination row spacing and seeding rate for Net Return \$/acre was seeding in a 6 inch row spacing at a seeding rate of 6 or 9 seeds/ft².
- Effects of row spacing and seeding rate on agronomic traits (data not shown) of flowering, maturity, plant height, kernel weight, percent oil and lodging were very small or non-significant and would have little practical value in canola production.

Canola Singulation - Small and Large On-Farm Trials



Canola Singulation - Small and Large On-Farm Trials

Small Plot



Large On-Farm Trial



Travis Messier Cooperator for Small Plot Singulation Trials

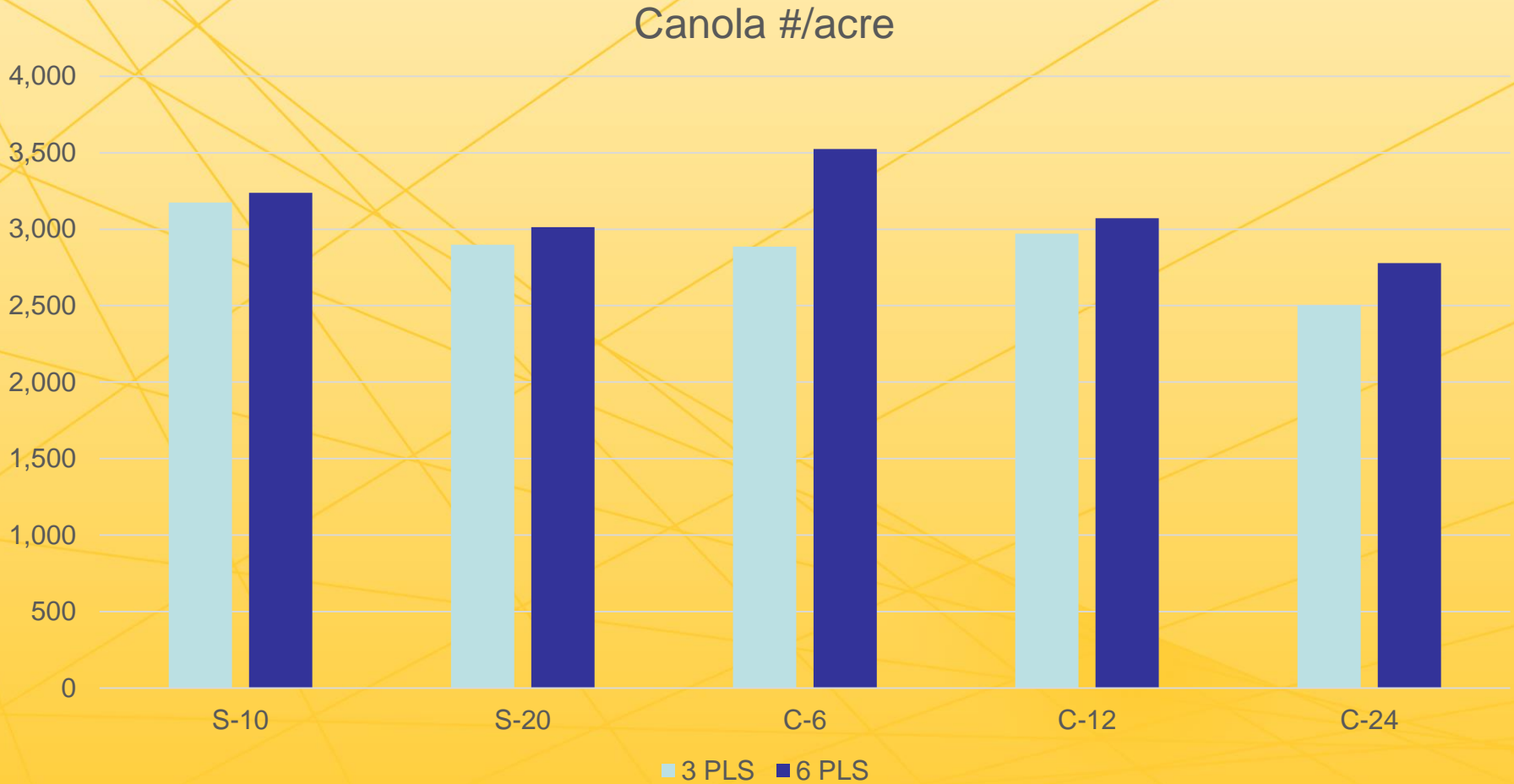
Small-Plot Planter



Seeding Plots @ CPC

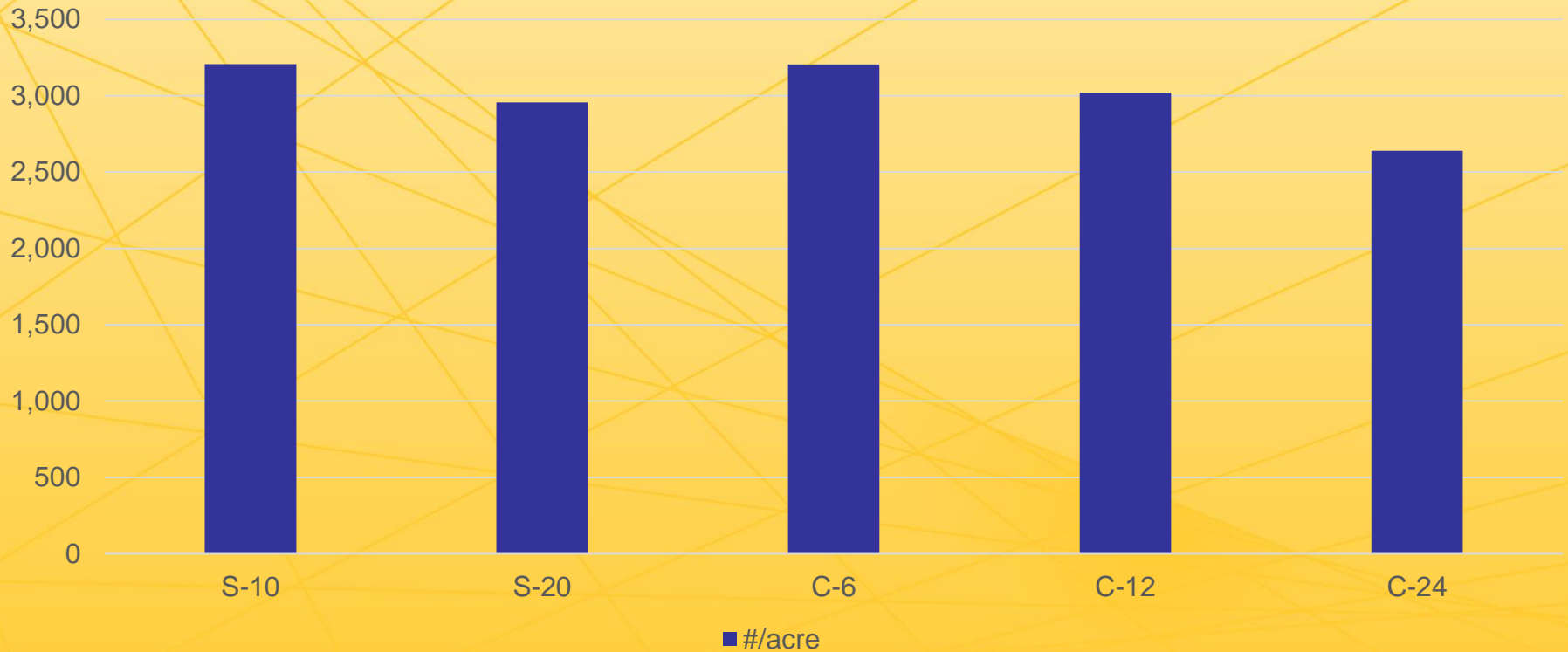


Canola Yields from Singulation and Conventional Planting in 2017

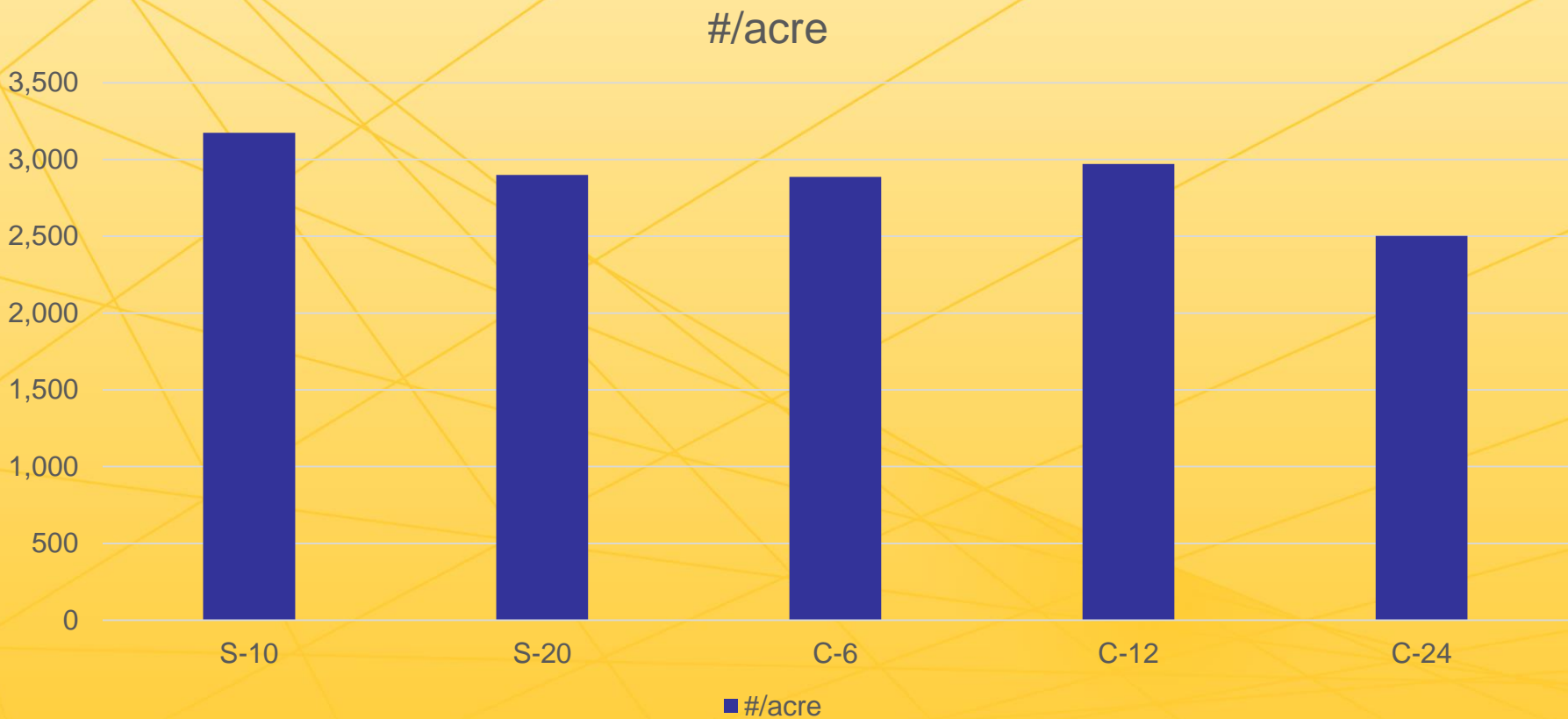


Canola Yields - Singulation vs Conventional Planting Averaged over 3 & 6 PLS/FT in 2017

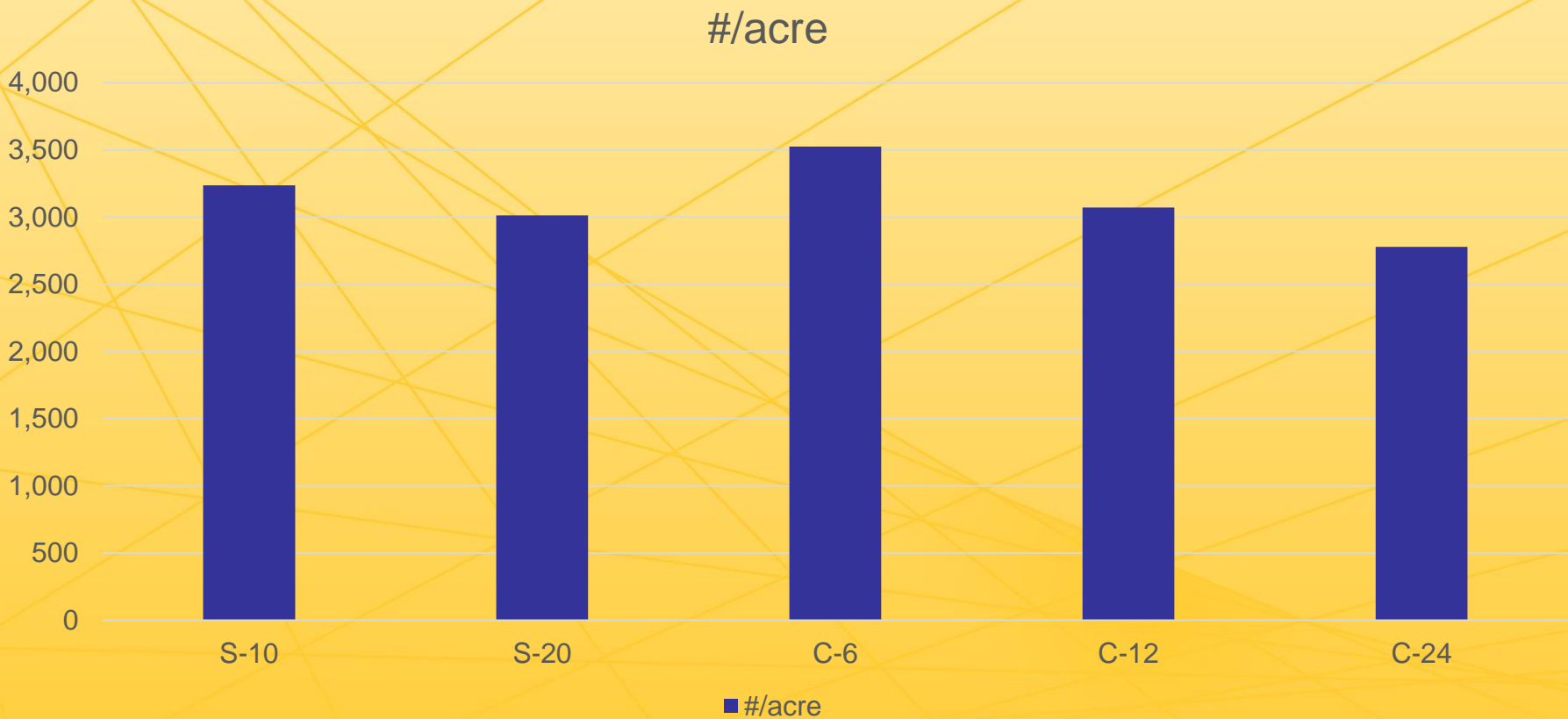
Canola #/acre



Canola Yields - Singulation vs Conventional Planting at 3 PLS/FT in 2017

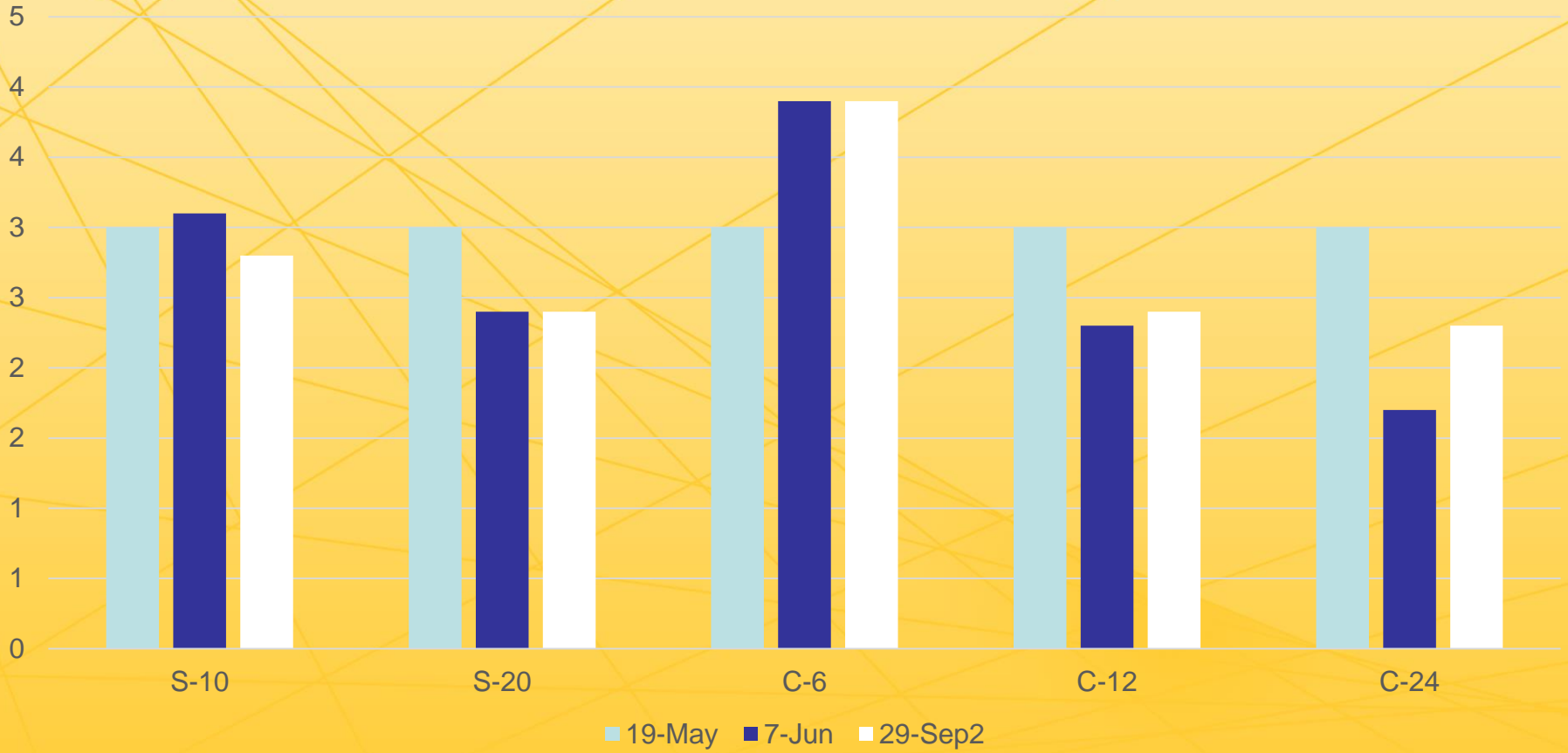


Canola Yields - Singulation vs Conventional Planting at 6 PLS/FT in 2017



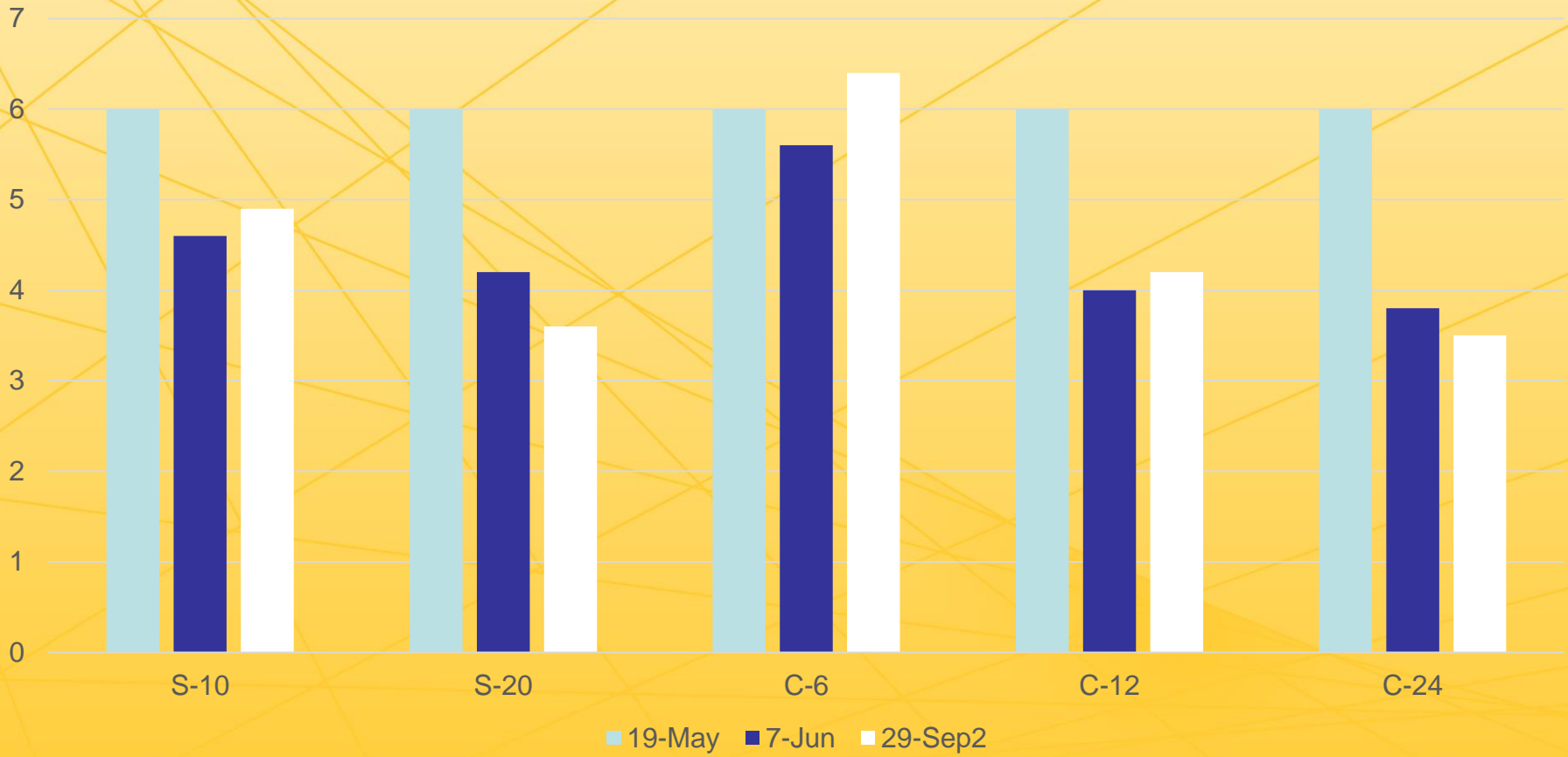
Canola Plant Counts from Singulation and Conventional Planting @ 3 PLS/FT2 in 2017

Plants/FT2



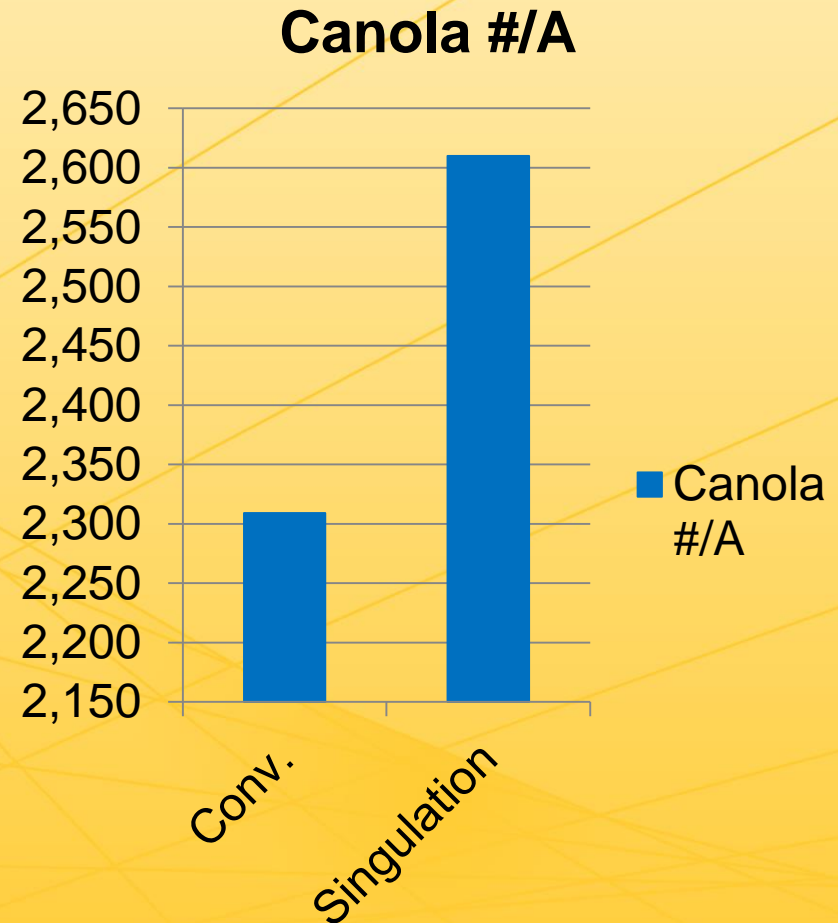
Canola Plant Counts from Singulation and Conventional Planting @ 6 PLS/FT2 in 2017

Plants/FT2



On-Farm - Singulation vs. Conventional Seeding - 2017

- Trial location Tony Brateng farm - Roseau
- Conventional canola seeded in 7.5 inch rows @ 5 #/acre
- Singulation canola seeded in 22 inch rows @ 2.7 #/acre



Direct Harvest Canola – Tony Brateng -2017

Direct Harvest Canola



Swathed Canola

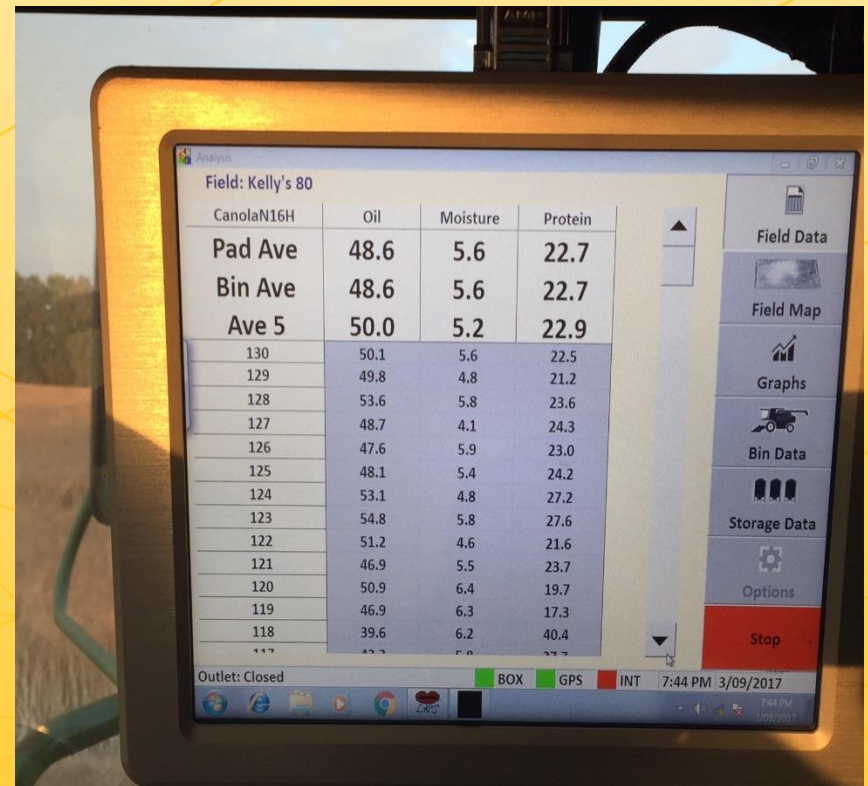


Direct Harvest Canola

Close-up Combine Header



On-Board Oil Monitor



Canola Direct Harvest

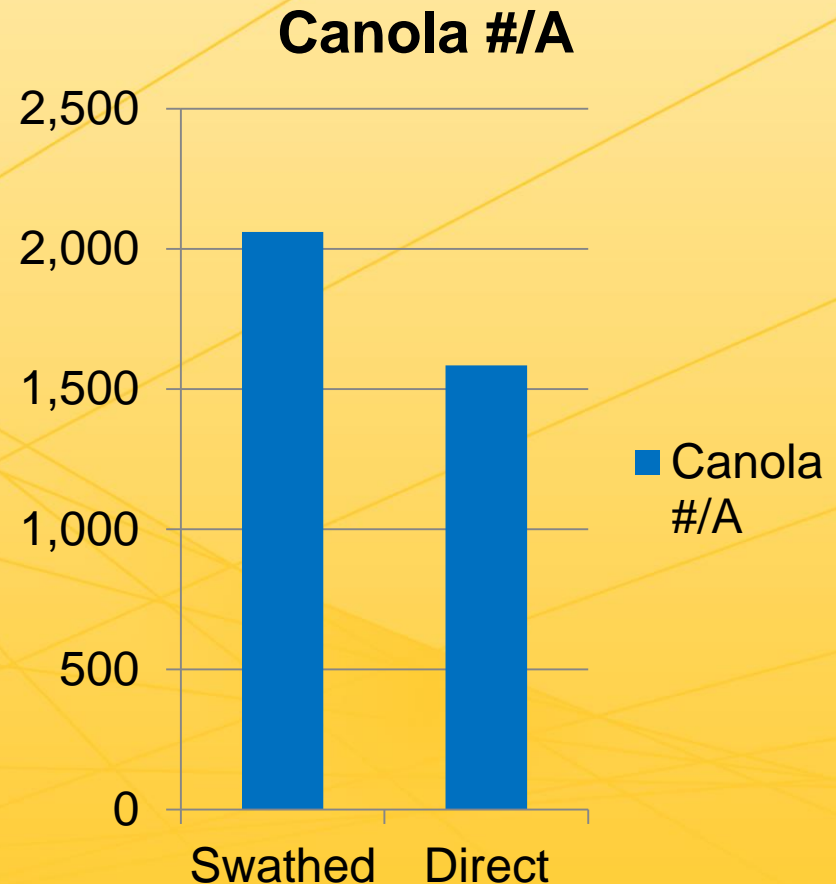


Swath vs. Direct Harvest - 2012

- **Cooperators Brian and Sheldon Rice**
- **Field operations conducted with commercial scale equipment**
- **Significant canola pod shatter due to hot windy weather**

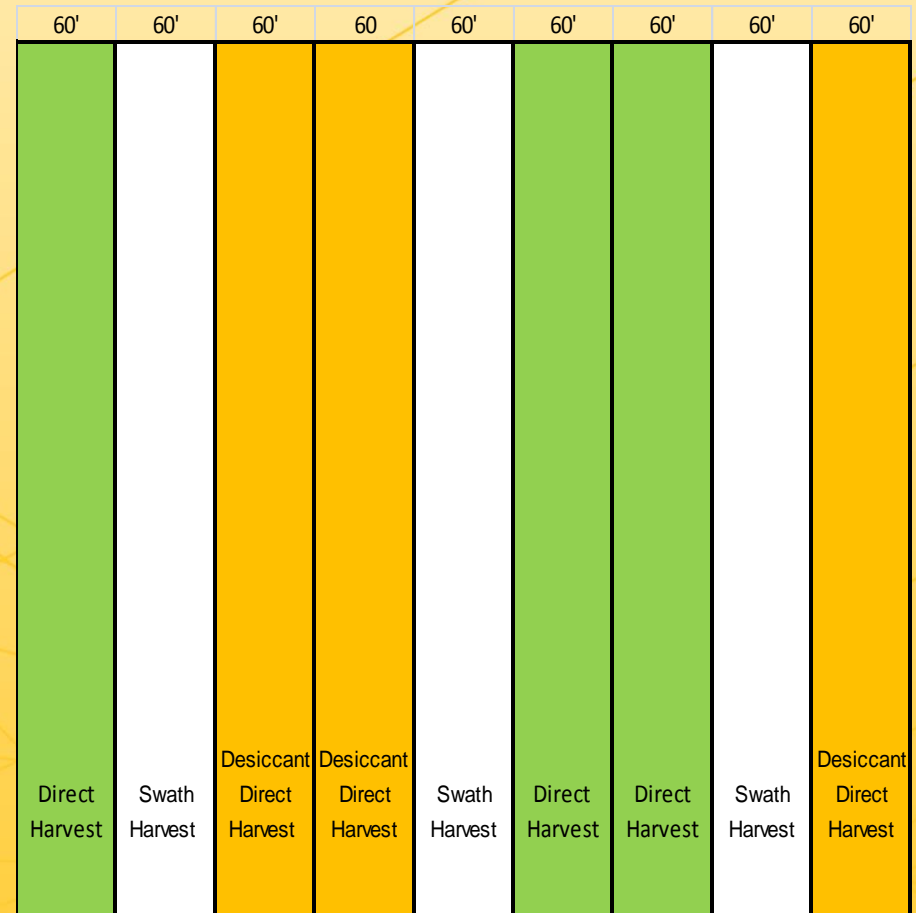


On-Farm Swathed Canola vs. Direct Harvest in 2012



On-Farm Canola Trial Swath vs Direct Harvest Hugh Hunt - 2013

- ❖ Fertility - 130-30-0-15
- ❖ All field operations commercial scale equipment
- ❖ Variety - Star 402
- ❖ Three treatments
 - Swathing
 - Direct harvest
 - Direct harvest with desiccant - Reglone



Large On-Farm Trial Direct Harvest vs Swathing

Each Strip Weighed



Weights & Sub-samples



Combine Harvest of Swaths and Straight Harvest Canola

Windrows



Direct Harvest



Two Factors Conducive for Direct Harvest Canola

Uniform Canola Stand



“Tabled” Canola



Large On-Farm Canola Trial: Swath vs Direct Harvest

- Trial location Hugh Hunt farm - Hallock
- Star 402 planted 4/27/15
- Both treatments combine on 8/19/15
- Treatments were swathing and direct harvest



Direct Harvest Canola

Uniform Canola Stand



Note Reel Height



Large On-Farm Swathing vs. Direct Harvest Trial

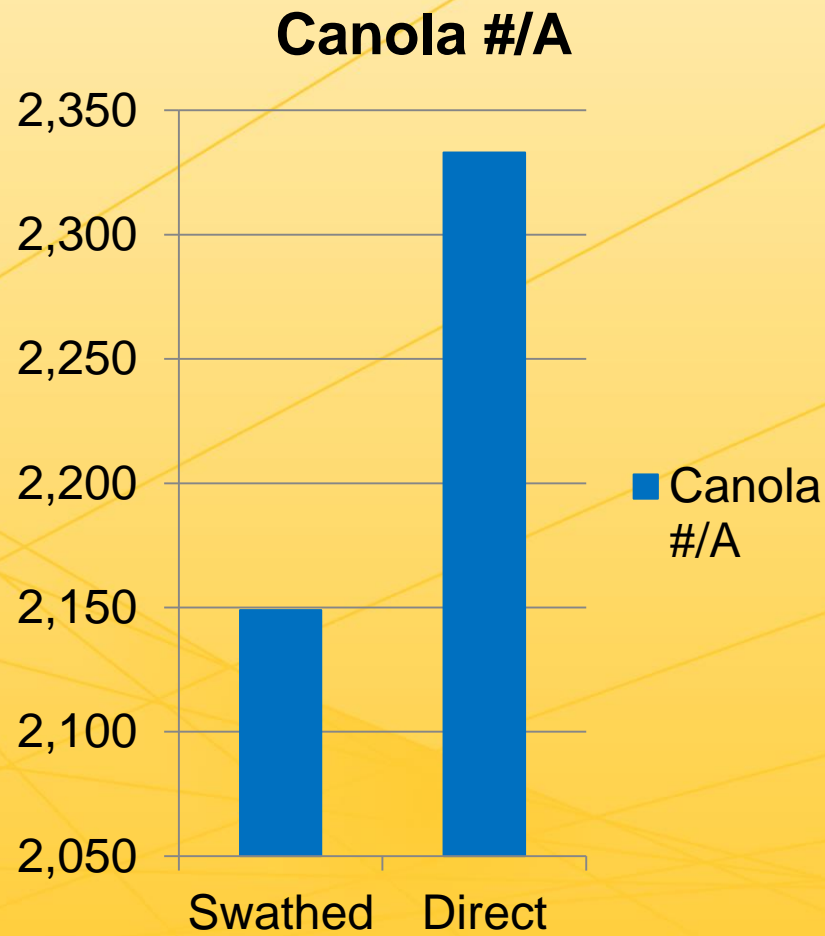
2013 Direct Harvest/Dessicant Trial

Hugh Hunt Farm- Hallock, MN

	Yield		Oil Yield		Test	
	#/acre	%Oil	#/acre	%moisture	Weight	%Dockage
1 Direct Combine	2876	52.8	1519	6.9	49.4	0.7
2 Swath/Combine	3053	52.6	1606	6.1	48	1.9
3 Dessicate*/Direct Combine	2940	52.1	1531	7.4	49.4	0.6
LSD @ 5% level	NS	0.5	NS	1.3	0.3	0.5
cv	6	0.5	6	8	0.3	18

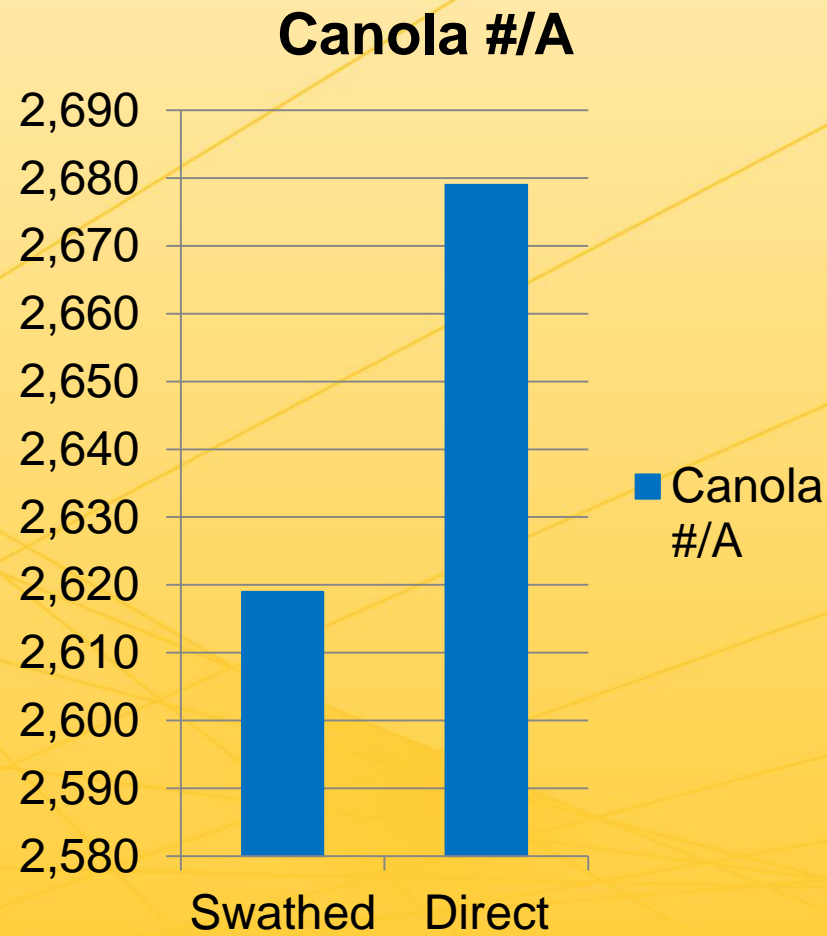
On-Farm Swathed vs. Direct Harvest Data - 2015

- Trial location Hugh Hunt farm - Hallock
- Star 402 planted 4/27/15
- Both treatments combine on 8/19/15
- Treatments were swathing and direct harvest



On-Farm Swathed vs. Direct Harvest Data - 2017

- Trial location Tony Brateng farm - Roseau
- Canola seeded in 7.5 inch rows @ 5 #/acre
- Both treatments combine on 9/03/17
- Treatments were swathing and direct harvest



Direct Harvest -Summary

- **Canola variety choice is important**
- **Uniform canola stand, low weed pressure**
- **Swathing or apply desiccant too early:**
 - **increase green count**
 - **decreased yield**
 - **decreased test weight**
- **No differences detected between direct harvest with desiccant or direct harvest alone**
- **Desiccant timing – later than swathing timing**
70-80% seed color change whole plant



Questions



Contact Information

- www.mncanola.org
- dave.grafstrom@northlandcollege.edu
- **Dave Grafstrom**
- **Cell: 320-293-8722**



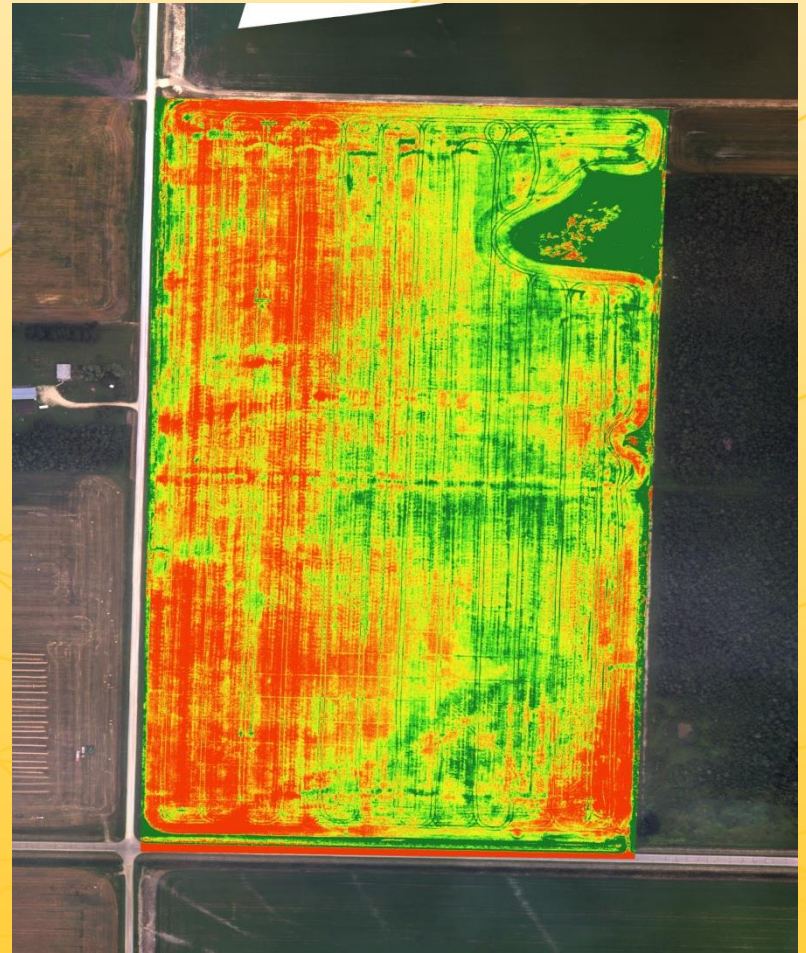
Canola Resources

- **Northern Canola Growers Association**
<http://www.northerncanola.com>
- **Canola Council of Canada -**
<http://www.canola-council.org>
- **Minnesota Canola Council**
<http://mncanola.org>



Aerial Photography

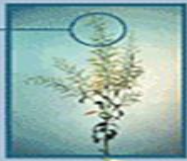
- **Aerial image taken 8/3/11**
- **Large on-farm location**
- **Red color stressed plants**
- **Cooperator: Steve Helmstetter**
- **Field harvested 8/11/11**



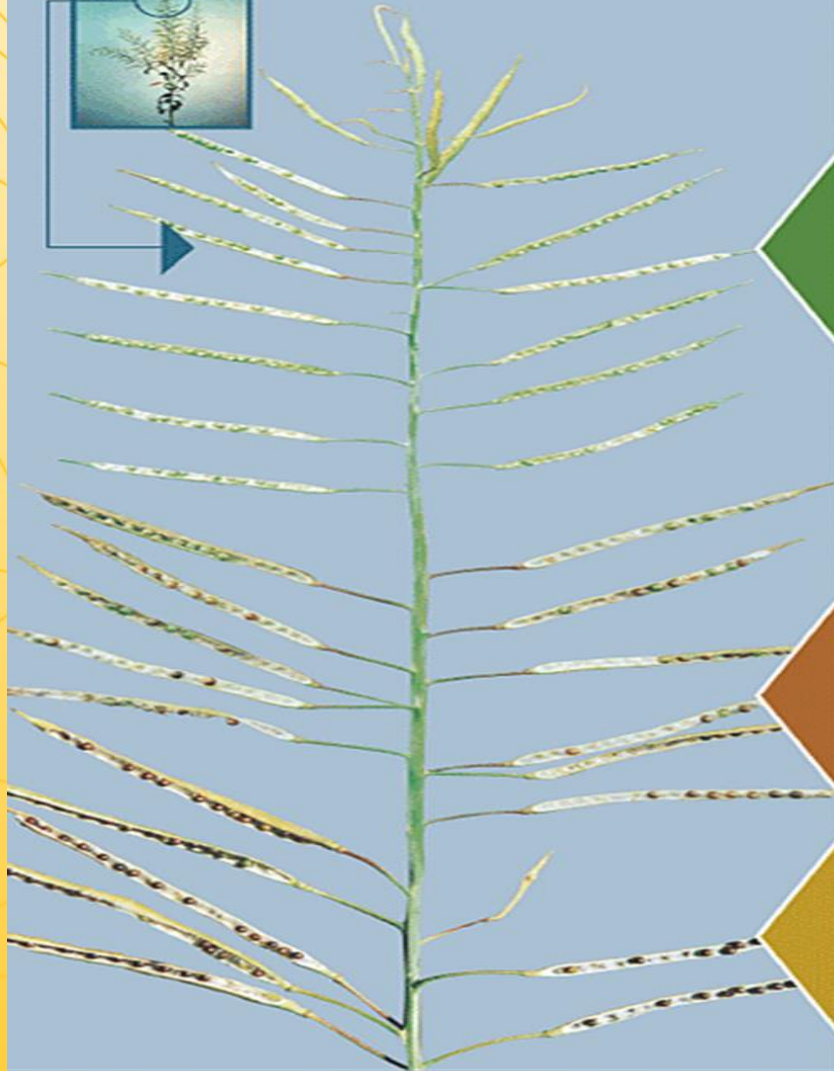
August 3, 2011



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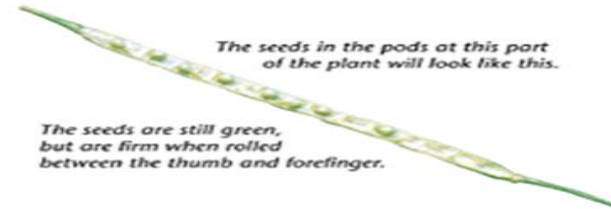
Main Stem



Seed Colour Change

To assist in determining proper time of swathing

The seeds in the pods at this part of the plant will look like this.



The seeds are still green, but are firm when rolled between the thumb and forefinger.

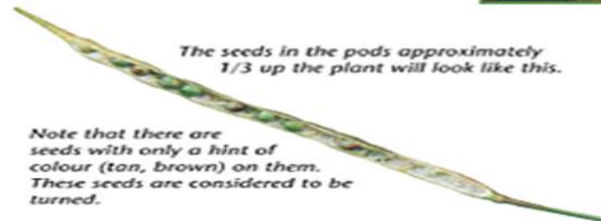


Seeds that are not firm will crush when rolled between thumb and forefinger.

Seeds that are firm will not crush when rolled between thumb and forefinger.



The seeds in the pods approximately 1/3 up the plant will look like this.



Note that there are seeds with only a hint of colour (tan, brown) on them. These seeds are considered to be turned.

The seeds in the pods at the bottom of the plant will be mostly turned and look like this.

