

XXII TIME OF SWATHING TRIAL

Objective: Compare the effects of various swathing dates and seeding rates on yield and quality of a hybrid canola.

Background: Traditionally, the recommended stage of swathing has been 30 to 40 % seed colour change (SCC) on the main stem to maximize yield and quality and minimize green seed and shattering. The introduction of hybrids, with associated lower seeding rates and lower plant densities, induces proliferation of extra secondary branching. The secondary branching results in a wider range of seed development and maturation as compared to traditional seeding rates. Therefore, the normal time of swathing (30 to 40 % SCC) may need to be delayed to a later stage to allow for optimum development and fill of the secondary branches.

Methodology: The time of swathing trial consisted of the following treatments in a split plot design with seeding rate as the main plot and swathing stage as the sub-plot:

1. 30 to 40% SCC (Seed Colour Change) ~ Prairie 499 @ 5.0 lb/ac
2. 40 to 50% SCC (Seed Colour Change) ~ Prairie 499 @ 5.0 lb/ac
3. 50 to 60% SCC (Seed Colour Change) ~ Prairie 499 @ 5.0 lb/ac
4. 60 to 70% SCC (Seed Colour Change) ~ Prairie 499 @ 5.0 lb/ac
5. Straight Combine ~ Prairie 499 @ 5.0 lb/ac
6. 30 to 40% SCC (Seed Colour Change) ~ Prairie 499 @ 3.0 lb/ac
7. 40 to 50% SCC (Seed Colour Change) ~ Prairie 499 @ 3.0 lb/ac
8. 50 to 60% SCC (Seed Colour Change) ~ Prairie 499 @ 3.0 lb/ac
9. 60 to 70% SCC (Seed Colour Change) ~ Prairie 499 @ 3.0 lb/ac
10. Straight Combine ~ Prairie 499 @ 3.0 lb/ac

SCC was determined on main stem (not whole plant).

Western Canadian Summary:

CPC Location	Selkirk, MB		Dauphin, MB		Yorkton, SK		Nipawin, SK		Beiseker, AB		Rycroft, AB	
	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD
30-40% SCC @ 3 lb/ac	27.3	133	30.7	145	24.1	90	18.3	49	25.2	120	20.1	61
40-50% SCC @ 3 lb/ac	26.6	127	33.2	166	24.7	95	21.0	73	25.6	131	21.1	43
50-60% SCC @ 3 lb/ac	28.6	145	32.9	164	26.1	108	23.4	95	26.8	142	21.9	48
60-70% SCC @ 3 lb/ac	27.9	139	34.7	180	26.6	113	23.6	96	24.1	110	23.8	60
Straight Cut @ 3 lb/ac	-	-	-	-	22.3	76	24.4	106	24.8	62	24.1	93
30-40% SCC @ 5 lb/ac	28.1	129	31.8	143	24.2	79	18.6	40	24.3	111	27.7	81
40-50% SCC @ 5 lb/ac	28.1	129	33.2	155	24.5	82	21.8	69	22.3	93	30.0	96
50-60% SCC @ 5 lb/ac	28.2	130	34.0	163	26.0	96	24.7	95	25.4	113	28.8	88
60-70% SCC @ 5 lb/ac	29.0	137	34.8	170	26.6	101	25.6	103	25.0	110	28.7	88
Straight Cut @ 5 lb/ac	-	-	-	-	19.3	37	26.9	117	23.8	48	30.1	99
LSD (any two treatments)	2.48		1.62		2.74		3.50		2.62		4.92	
LSD (stage within rate)	1.73		1.84		2.26		1.44		1.74		2.82	
CV%	5.1		4.5		7.6		5.2		4.9		9.1	

Note: NYD - Net Yield Data (bu/ac), CMD - Contribution Margin Data (\$/ac)
 (-) Indicates treatment not conducted.

Discussion:

Delay in swathing had no negative impact for the hybrid variety (Prairie 499 RR). The overall yield tended to stay the same or increase. By the 50 to 60% SCC stage most of this yield advantage was captured for both of the seeding rates. It is important to consider that there are risks involved when trying to capture this potential yield advantage. The risks include shattering or pod drop due to mechanical or environmental damage and fall frost damage that can lead to green seed problems.

SELKIRK

Methodology:

Seeding took place on May 24 at a depth of ¾" into excellent moisture. In-crop weed control included an application of Vantage Plus (0.5 L/ac) at the 5 to 6-leaf stage of the canola. Swathing at 75 to 85% seed colour change was substituted for the straight combining treatments due to a lack of equipment availability. All other agronomic practices were conducted as described in the *Site Information*.

Observations:

Emergence was good for all treatments, with the 3 and 5 lb/ac seeding rates producing average plant densities of 104 and 130 plants/m², respectively. This was a somewhat smaller difference in density than expected, and as a result the differences in branch counts were minimal. Plant counts were taken following swathing, so higher mortality in the denser stand from the 5 lb/ac seeding rate may have been a factor due to increased competition. High temperatures during seed maturation resulted in increases of 10% SCC or more per day.

Results:

TIME OF SWATHING TRIAL Selkirk, MB							
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	1,000 kwt	Grade	Green (%)
Seeding Rate - 3 lb/ac							
30 to 40% SCC	97	27.3	133.40	46.1	3.3	1	0.2
40 to 50% SCC	95	26.6	127.10	46.2	3.4	1	0.1
50 to 60% SCC	102	28.6	145.10	46.2	3.5	1	0.2
60 to 70% SCC	99	27.9	138.80	46.3	3.4	1	0.2
75 to 85% SCC	101	28.5	144.20	46.4	3.4	1	0.2
Seeding Rate - 5 lb/ac							
30 to 40% SCC	100	28.1	129.06	45.8	3.2	1	0.0
40 to 50% SCC	100	28.1	129.06	46.3	3.3	1	0.1
50 to 60% SCC	100	28.2	129.96	46.2	3.3	1	0.3
60 to 70% SCC	103	29.0	137.16	46.3	3.3	1	0.0
75 to 85% SCC	95	26.6	115.56	46.3	3.4	1	0.1
LSD any 2 treatments		2.48		0.41	0.19		
LSD stage w/in rate		1.73		0.28	0.15		
CV%		5.1		0.5	3.8		

Discussion:

Yields tended to be similar for both seeding rates, and swathing stage had little impact on yield for either seeding rate. The one exception was the last swathing stage of the 5 lb/ac seeding rate, which did have some yield reduction, probably due to shattering losses. Oil content tended to increase slightly with delayed swathing, although the trend was only significant for the 5 lb/ac seeding rate. Thousand-kernel weight tended to increase with delayed swathing for both seeding rates. Economic returns reflected minor differences in yield, and differences in seed costs.

DAUPHIN**Methodology:**

Seeding took place on May 15 at a depth of $\frac{3}{4}$ to 1" into good moisture. In-crop weed control included an application of Vantage Plus (0.7 L/ac) at the 2 to 3-leaf stage of the canola. The straight combining treatments were abandoned due to a lack of equipment availability. All other agronomic practices were conducted as described in the *Site Information*.

Observations:

Emergence was slow due to cold temperatures during and following seeding. However, both seeding rates eventually reached very good plant densities. The 3 and 5 lb/ac seeding rates produced average plant densities of 110 and 145 plants/m², respectively. The higher plant populations of the 5 lb/ac seeding rate resulted in 0.7 fewer primary branches per plant as compared to the 3 lb/ac seeding rate, and 2.4 fewer secondary branches per plant. Weed density in this trial was light to moderate, but a slightly higher rate of Vantage Plus was used to provide improved suppression of scattered quack grass patches. Weed control was good throughout the trial.

Results:

TIME OF SWATHING TRIAL Dauphin, MB							
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	1,000 kwt	Grade	Green (%)
Seeding Rate - 3 lb/ac							
30 to 40% SCC	97	30.7	143.85	42.9	3.3	1	0.0
40 to 50% SCC	104	33.2	166.35	44.7	3.5	1	0.1
50 to 60% SCC	103	32.9	163.65	44.9	3.4	1	0.2
60 to 70% SCC	109	34.7	179.85	45.5	3.5	1	0.0
Seeding Rate - 5 lb/ac							
30 to 40% SCC	100	31.8	142.79	43.8	3.1	1	0.1
40 to 50% SCC	104	33.2	155.39	44.8	3.4	1	0.4
50 to 60% SCC	107	34.0	162.59	45.0	3.3	1	0.3
60 to 70% SCC	109	34.8	169.79	45.8	3.8	1	0.1
LSD any 2 treatments		1.62		0.68	0.23		
LSD stage w/in rate		1.84		0.52	0.24		
CV%		4.5		1.0	5.8		

Discussion:

Delaying swathing improved yield for both seeding rates, and economic returns increased accordingly. Seeding rate had no significant impact on yield for each swathing stage, and as a result contribution margins were slightly lower at the 5 lb/ac seeding rate due to the added seed cost. Delaying swathing also significantly improved oil content, regardless of seeding rate. Thousand-kernel weight also tended to increase with delayed swathing, but the trend was only significant for the 5.0 lb/ac seeding rate. All treatments graded number one.

YORKTON

Methodology:

Seeding took place on May 8. Corn cob grit was used as a seed-bulking agent to better regulate seeding rates. Both seeding rates were calculated on an 8.0 lb/ac total product basis. A fertilizer blend of 7-30-10-0 (actual) was seed-placed for all treatments. Eclipse (Vantage Plus @ 0.5 L/ac and Lontrel @ 0.17 L/ac) was applied at the 2 to 3-leaf stage of the crop. Treatments were swathed with a 20 ft Versatile 4400 swather equipped with a pick-up reel and harvested with a New Holland TR 85 combine. Straight combining treatments were harvested with a 20 ft New Holland flex header.

Observations: Cool and dry growing conditions resulted in slow and uneven emergence. Flea beetles caused considerable damage during early plant development (see *Site Information - Comments*). Canada thistle, wild buckwheat and volunteer wheat were the predominant weeds. Weed pressure was moderate in most areas. In-crop weed control was good. Lodging was apparent in low-lying areas. Cool, wet weather during maturation resulted in even seed colour change within a plot. Days to swathing ranged from 95 (30 to 40 % SCC) to 105 days (60 to 70 % SCC) within both seeding rate treatments. Shattering was evident in the straight combined treatments.

Results: (a) Plant stand measurements

TIME OF SWATHING TRIAL Yorkton, SK					
Treatment	Emergence Counts (plants/m²)	Plant Height (cm)	Lodging Ratio (%)	# Primary Branches	# Secondary Branches
3.0 lb/ac - Seeding Rate					
30-40% SCC	59	86	96	7	2
40-50% SCC	64	85	94	6	2
50-60% SCC	59	82	91	7	2
60-70% SCC	60	86	96	7	2
Straight Cut	60	76	94	7	2
5.0 lb/ac - Seeding Rate					
30-40% SCC (check)	87	94	96	4	1
40-50% SCC	90	95	97	3	1
50-60% SCC	80	91	93	4	2
60-70% SCC	86	91	93	3	1
Straight Cut	88	84	86	4	2

Results: (b) Yield and quality data

TIME OF SWATHING TRIAL Yorkton, SK						
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	1000 kwt	Grade
Seeding Rate - 3 lb/ac						
30 to 40% SCC	100	24.1	89.82	45.8	2.9	1
40 to 50% SCC	102	24.7	95.22	46.8	3.0	1
50 to 60% SCC	108	26.1	107.82	47.3	3.1	1
60 to 70% SCC	110	26.6	112.32	48.1	3.1	1
Straight Cut	93	22.3	75.68	48.1	3.0	1
Seeding Rate - 5 lb/ac						
30 to 40% SCC	100	24.2	79.18	45.5	2.9	1
40 to 50% SCC	102	24.5	81.88	46.3	3.1	1
50 to 60% SCC	108	26.0	95.38	47.2	3.1	1
60 to 70% SCC	110	26.6	100.78	48.3	3.1	1
Straight Cut	80	19.3	37.14	47.8	3.2	1
LSD any 2 treatments		2.74		0.83		
LSD stage w/in rate		2.26		0.80		
CV%		7.6		1.4		

Discussion:

The lower seeding rate treatments had increased branching by at least 50 %. Yield trends indicated a positive yield advantage to delayed swathing. Swathing past the 30 to 40 % seed colour change recommendation resulted in a significant yield increase for either seeding rate at 60 to 70% seed colour change. Straight combining resulted in a significantly lower yield in the 5.0 lb/ac seeding rate. Straight cut losses were attributed to shattering by the header in lodged areas and wind damage four days prior to harvest.

Oil content also increased significantly as swathing was delayed. Thousand kernel weights also increased with delayed harvesting. Contribution margins reflected differences in yield, machinery costs and seed costs.

NIPAWIN

Methodology:

Seeding took place on May 16. Corn cob grit was used as a seed-bulking agent to better regulate seeding rates. Both seeding rates were calculated on an 8.0 lb/ac total product basis. A liquid fertilizer blend of 87-30-10-20 (actual) was side-banded with all treatments. Vantage Plus (0.5 L/ac) was applied at the 2 to 3-leaf stage. Treatments were swathed with an 18 ft Versatile 400 swather equipped with a bat reel

and harvested with a New Holland TR 85 combine. Straight combining treatments were harvested with a 20 ft New Holland flex header.

Observations: Cool conditions combined with heavy trash resulted in slow and uneven emergence. Weed pressure was moderate in most areas. In-crop weed control was good. Lodging was apparent in low-lying areas. Days to swathing ranged from 94 (30 to 40 % SCC) to 104 days (60 to 70 % SCC) within both seeding rate treatments. No shattering was evident in the straight combined treatments.

Results: (a) Plant stand measurements

TIME OF SWATHING TRIAL Nipawin, SK					
Treatment	Emergence Counts (plants/m²)	Plant Height (cm)	Lodging Ratio (%)	# Primary Branches	# Secondary Branches
3.0 lb/ac - Seeding Rate					
30-40% SCC	68	86	97	4	2
40-50% SCC	64	83	94	4	2
50-60% SCC	69	82	93	5	2
60-70% SCC	65	86	97	5	2
Straight Cut	63	81	92	4	2
5.0 lb/ac - Seeding Rate					
30-40% SCC (check)	86	84	95	3	1
40-50% SCC	83	85	96	3	1
50-60% SCC	88	81	92	3	2
60-70% SCC	86	81	92	3	1
Straight Cut	88	84	95	3	2

Results: (b) Yield and quality data

TIME OF SWATHING TRIAL Nipawin, SK						
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	1,000 kwt	Grade
Seeding Rate - 3 lb/ac						
30 to 40% SCC	100	18.3	48.62	42.8	3.9	1
40 to 50% SCC	115	21.0	72.92	43.1	4.0	1
50 to 60% SCC	128	23.4	94.52	43.3	4.1	1
60 to 70% SCC	129	23.6	96.32	43.9	4.3	1
Straight Cut	133	24.4	105.58	43.6	4.6	1
Seeding Rate - 5 lb/ac						
30 to 40% SCC	102	18.6	39.78	42.7	3.6	1
40 to 50% SCC	119	21.8	68.58	43.3	3.9	1
50 to 60% SCC	135	24.7	94.68	44.1	4.0	1
60 to 70% SCC	140	25.6	102.78	44.1	4.3	1
Straight Cut	147	26.9	116.54	44.5	4.3	1
LSD any 2 treatments		3.50		0.64		
LSD stage w/in rate		1.44		0.47		
CV%		5.2		1.0		

Discussion:

The lower seeding rate treatments had increased branching. Swathing past the 30 to 40 % seed colour change recommendation resulted in a significant increase in yield for both seeding rates.

Oil content generally increased as swathing was delayed. Thousand kernel weights increased with delayed harvesting. Contribution margins reflected differences in yield, machinery costs and seed costs.

BEISEKER

Methodology:

The trial was seeded on May 24. All treatments were sprayed with Roundup Transorb (0.5 L/ac) at the 1 to 2-leaf stage of the crop.

Observations:

Emergence was rapid and even. The 3 lb/ac treatment averaged 112 plants/m² and the 5 lb/ac treatments averaged 140 plants/m². Heat in July caused flower blast in all treatments. Second growth (re-flowering) occurred across all treatments. At 60-70% seed color change, shelling was observed at the time of swathing for both seeding rates. Weather was poor for curing, and some swaths had green pliable stems and

Pods at harvest. The straight cut treatment was still flowering in spots at harvest time.

Results:

TIME OF SWATHING TRIAL							
Beiseker, AB							
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	1,000 kwt	Grade	Green (%)
Seeding Rate - 3 lb/ac							
30 to 40% SCC	100	25.2	119.87	42.6	3.7	1	1.6
40 to 50% SCC	102	25.6	130.78	42.6	4.2	1	1.4
50 to 60% SCC	106	26.8	141.58	42.2	3.7	1	1.8
60 to 70% SCC	96	24.1	110.29	43.2	4.4	2	3.0
Straight Cut	98	24.8	62.34	42.8	4.4	sample	52.0
Seeding Rate - 5 lb/ac							
30 to 40% SCC	100	24.3	111.13	42.5	4.7	1	1.4
40 to 50% SCC	92	22.3	93.13	42.0	4.7	1	1.9
50 to 60% SCC	105	25.4	113.67	42.4	3.9	2	1.6
60 to 70% SCC	103	25.0	110.18	42.3	4.5	2	2.5
Straight Cut	98	23.8	48.02	42.8	4.8	sample	68.0
LSD any 2 treatments		2.62		0.91			
LSD stage w/in rate		1.74		1.00			
CV%		4.9		1.6			

Note: Grade column indicates both green and damage seed.

Discussion:

The highest yields were achieved at 50 to 60% SCC for both seeding rates, although the advantage was not always significant. The treatments that graded a number two may not have had enough time to cure in the swath prior to a frost, causing damaged seed. The high green seed levels in the straight cut treatments were a direct result of frost damage.

RYCROFT

Methodology:

This trial was seeded on May 30. Weed populations were controlled using an application of Roundup Transorb (0.5 L/ac) at the 2 to 3-leaf stage of the crop.

Observations:

Stand establishment was uniform for both seeding rates. Plant densities were lower for the 3 lb/ac seeding rate. The lower seeding rate also had more branching.

Results:

TIME OF SWATHING TRIAL Rycroft, AB					
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Grade
Seeding Rate - 3 lb/ac					
30 to 40% SCC	73	20.1	60.71	43.9	3b
40 to 50% SCC	76	21.1	42.84	45.6	sample
50 to 60% SCC	79	21.9	48.00	45.5	sample
60 to 70% SCC	86	23.8	60.25	46.0	sample
Straight Cut	87	24.1	93.43	46.9	3b
Seeding Rate - 5 lb/ac					
30 to 40% SCC	100	27.7	81.06	45.2	sample
40 to 50% SCC	108	30.0	95.90	46.8	sample
50 to 60% SCC	104	28.8	88.16	46.3	sample
60 to 70% SCC	104	28.7	87.51	46.8	sample
Straight Cut	108	30.1	98.62	46.9	sample
LSD any 2 treatments		4.92			
LSD stage w/in rate		2.82			
CV%		9.1			

Discussion:

The 5 lb/ac seeding rate yielded higher than the 3 lb/ac seeding rate across all swathing stages. Although there were some significant differences in yield, there was no clear trend with regard to swathing stage. Contribution margins reflected differences in yield, machinery costs, seed costs and grade.

DAWSON CREEK

Methodology:

This trial was seeded on May 26. Weed populations were controlled using an application of Roundup Transorb (0.5 L/ac) at the 2 to 3-leaf stage of the crop.

Observations:

Stand establishment was uniform for both seeding rates. Plant densities were lower for the 3 lb/ac seeding rate. The lower seeding rate also had more branching.

Results:

Due to the high co-efficient of variation for this trial, no accurate conclusions could be made. Therefore, the results have not been reported.