

XXII HARVEST MANAGEMENT (PUSHING) TRIAL

Objective: To evaluate the potential of the "Yield Shield" canola pusher for improving the success of straight combining of *B. napus* canola.

Background: Past research at Canola Production Centres has indicated that shattering losses from straight combining *B. napus* canola generally outweigh any yield benefits as compared to swathing. However, results have varied from losses as large as 50 % to small increases in yield, depending on the variety used and environmental conditions. The trials where straight combining has been most successful indicate that lodged crops make the best candidate for straight combining. Ag Shield, a manufacturing company in Benito, Manitoba, has designed a header that can be used to simulate lodging by pushing the crop over. These trials will assess whether this new technology actually improves the success of straight combining.

Methodology: Treatments will include some or all of the following:

- A) Swathed - at appropriate seed colour change (check)
- B) Straight combined without pushing
- C) Pushed early (about 10 days prior to swathing) then straight cut
- D) Pushed late (about 10 % seed colour change) then straight cut

Western Canadian Summary:

CPC Location	Selkirk MB		Grenfell SK	
	NYD	CMD	NYD	CMD
HARVEST MANAGEMENT (PUSHING) TRIAL				
Swathed (check)	30.1	35	33.0	84
Pushed - Early	30.4	37	-	-
Pushed - Late	33.4	57	30.4	66
Straight Cut	34.6	67	31.4	75

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

DAUPHIN

Methodology: Seeding took place on May 29. The Roundup Ready variety DKL34-55 was seeded at 6.5 lb/ac. Roundup Transorb was applied at 0.5 L/ac at the 4-leaf stage of the crop. The fungicide Rovral Flo (0.85 L/ac) was applied at about 40 % bloom. One treatment was swathed with an 18 ft Versatile 400 swather equipped with a pick-up reel and lifter guards. The pushed treatments were pushed with a 30 ft "Yield Shield" header, then harvested with a 24 ft John Deere straight combine header with a bat reel. Straight cut treatments were harvested with the same header. A John Deere 7700 combine harvested the swathed plots. A John Deere

9610 was used for the straight cut and pushed treatments, due to equipment availability and compatibility with the header.

Observations:

Emergence was quick due to adequate moisture and heat. Weeds present included wild oats, volunteer wheat, wild mustard and hemp-nettle. Herbicide application occurred when the canola was at approximately the 4-leaf stage, with good weed control. No significant disease or insect pressure was noted. The crop was rather short, and as a result the pushed treatments had to be pushed very low to keep them from springing back up. Conditions from swathing through harvest were quite warm and dry. Little or no shelling was apparent in the pushed and straight cut treatments.

Results: (a) Plant stand measurements

HARVEST MANAGEMENT (PUSHING) TRIAL Dauphin, MB			
Treatment	Plant Height (cm)	Canopy Height (cm)	Lodging Ratio (%)
Swathed (check)	114	N/A	N/A
Pushed - Early	114	52	45
Pushed - Late	114	44	38
Straight Cut	114	80	70

Results: (b) Yield and quality data

HARVEST MANAGEMENT (PUSHING) TRIAL Dauphin, MB							
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Days To Harvest	Grade	Green (%)
Swathed (check)	100	30.1	34.50	43.2	112	1	0.5
Pushed - Early	101	30.4	36.52	43.5	113	1	0
Pushed - Late	111	33.4	56.77	43.9	113	1	0
Straight Cut	115	34.6	66.95	44.4	113	1	0
LSD		2.68		0.79			
CV%		6.4		1.4			

Discussion:

Among those treatments that were straight combined, the lodging ratios were highest in the treatment that was not pushed. The treatment pushed at 10 % seed colour change was lodged the most since it had less time to rebound after pushing. As a result, combine speed was slowed in the pushed treatments, as compared to straight combining or swathing.

Straight cutting resulted in significantly higher yield than swathing. This was probably due to conditions that were not conducive to shattering. The hot, dry conditions following swathing could also have contributed to greater seed shrinkage in the swathed treatments. Pushing early produced similar yields to swathing, while pushing later was similar to straight cutting. This indicates that perhaps the bending of the stems did in some way inhibit pod filling. Only the straight cut treatment produced significantly higher oil content than swathing. Contribution margins reflected yield and a \$2.00 per acre discount on machinery cost (fuel, lube and repairs) for straight cutting. It was assumed that these costs would be similar for swathing and pushing.

GRENFELL

Methodology:

Seeding took place on May 17. The Roundup Ready variety 45A51 was seeded at 6.0 lb/ac. A fertilizer blend of 10-25-10-5 (actual) was seed-placed for all treatments. Vantage Plus was applied at 0.5 L/ac at the 2 to 3-leaf stage of the crop. A fungicide was applied to control sclerotinia stem rot at 20 to 25 % bloom. One treatment was swathed with a 20 ft Versatile 4400 swather equipped with a pick-up reel. Another treatment was pushed with a "Yield Shield" 30 ft pusher then harvested with a 20 ft New Holland flex straight combine header. Straight cut treatments were harvested with the same header. A New Holland TR85 combine harvested all treatments.

Observations:

Excellent moisture and warm soil temperatures resulted in rapid emergence. Canada thistle, wild buckwheat and volunteer barley were the predominant weeds. Weed pressure was moderate in all treatments. In-crop weed control was good. Lodging was apparent in low-lying areas. Hot, dry weather during maturation caused rapid seed colour change. Crop loss was evident in the straight combined treatments. Harvestability varied greatly among treatments.

Results: (a) Plant stand measurements

HARVEST MANAGEMENT (PUSHING) TRIAL Grenfell, SK				
Treatment	Emergence Counts (plants/m²)	Plant Height (cm)	Canopy Height (cm)	Lodging Ratio (%)
Swathed (check)	112	132	121	92
Pushed - Late	115	135	40	30
Straight Cut	109	134	109	81

Results: (b) Yield and quality data

HARVEST MANAGEMENT (PUSHING) TRIAL Grenfell, SK				
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)
Swathed (check)	100	33.0	83.59	43.9
Pushed - Late	92	30.4	66.04	44.8
Straight Cut	95	31.4	74.87	44.9
LSD		0.79		1.84
CV%		1.4		2.4

Discussion:

Lodging ratios were highest in the pushed treatment due to the effect of pushing canola. Straight combined treatments were also lodged. Speed of operation was reduced dramatically from an average of 3.5 miles/hr in swathed treatments to 1.5 miles/hr in pushed treatments. Straight combined treatments were harvested at 2.5 miles/hr.

Yield differences of 0.79 bu/ac or greater were significant. Harvest management had a significant impact on yield. Pushing yield losses were mostly attributed to mechanical damage (shelling) during combining. However, the combination of mechanical damage in the lodged areas and wind damage contributed to yield losses in straight cut treatments. Oil content did not vary significantly. Contribution margins reflected yield and a \$2.00 per acre discount on machinery cost (fuel, lube and repairs) for straight cutting. It was assumed that these costs would be similar for swathing and pushing.