

EVALUATION REPORT 359



WALLIS PTL 130 DOUBLE WINDROW ATTACHMENT

A Co-operative Program Between



ALBERTA
FARM
MACHINERY
RESEARCH
CENTRE



PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

WALLIS PTL 130 DOUBLE WINDROW ATTACHMENT

MANUFACTURER AND DISTRIBUTOR:

REM Manufacturing Limited
Contract Division
P.O. Box 1207
Swift Current, Saskatchewan
S9H 3X4

RETAIL PRICE:

\$6,989.00 (March, 1984, f.o.b. Swift Current, Saskatchewan* with optional hydraulic control kit and rear draper position cylinder).

*Must be picked up at Swift Current.

SUMMARY AND CONCLUSIONS

Rate of Work: With the 24 ft (7.3 m) windrower, average speeds for Wallis PTL 130 were 4 to 6 mph (6 to 10 km/h). Average work rates varied from 9 to 13 ac/h (3.6 to 5.3 ha/h).

Quality of Work: Draper performance was *good*. Uniform crops were conveyed smoothly, however, some plugging occurred in tall and very ripe crops. Parallel windrow patterns were predominant. Double windrows could be overlapped or laid side-by-side. Windrow uniformity varied from *very good* in straight clean crops to *poor* in some tall or very ripe crops. Poor feeding through the windrow opening onto the front draper reduced uniformity in tall or very ripe crops.

Ease of Operation: Ease of installation was *good*. Instructions were adequate. Complete installation took two men about 8 hours. The rear draper platform was difficult to align when removing and remounting. Controls were *good*. The optional hydraulic control kit was convenient to use, but the control switches were not labelled. Lifting rates and draper speeds were adequate. Windrow position was easy to control with the optional rear platform cylinder.

Handling was *very good*. The rear draper platform followed ground contours well. Ease of transporting was *good*. The Wallis PTL 130 did not have to be removed for transporting short distances, but had to be pulled into the ditch when meeting traffic.

Ease of adjustment was *good*. Draper speed was easily adjusted with the flow control valve. The draper tighteners were difficult to adjust and the front draper tightener was hard to reach.

Ease of servicing was *good* as daily servicing took less than 5 minutes.

Power Requirements: A 60 hp (45 kW) tractor capable of supplying 8.3 gpm (0.63 L/s) at 2000 psi (13.8 MPa) was required to operate the windrower with the Wallis PTL 130.

Operator Safety: The Wallis PTL 130 was fairly safe to operate if proper safety procedures were followed. The front draper tightener was dangerously located under the cutterbar.

Operator Manual: No operator manual was supplied.

Mechanical History: The front draper was damaged three times during the test. Seven other minor problems occurred.

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. The Wallis PTL 130 was able to handle a large quantity of crop material without any plugging problems. Plugging occurred because overripe crops were too light and fluffy to be carried on the canvases. The operator manual will explain proper operating techniques for best performance.
2. A jack has been added and improved mounting brackets will make removal and remounting a simple, one-man task.
3. The console switches will be labelled.
4. The front draper will have a spring-loaded over-centre tightener which will be more convenient and safer to operate. The draper will not have to be loosened overnight. Rear draper tightener modifications will be considered.
5. An operator manual will be available in 1984.
6. A pipe clamp is available to prevent the rear draper platform from sliding all the way to the right. The operator manual will explain how to use the pipe clamp. Modifications are being considered.
7. The draper manufacturer has been advised of the metal splice problem. The metal splice was about 1/4 in (6.4 mm) wider than the draper. Future drapers will be properly manufactured. Minor modifications to the guides will prevent draper damage.

MANUFACTURER'S ADDITIONAL COMMENTS

1. Although the Wallis PTL 130 can be operated independently to lay a double windrow, many farmers prefer to follow another windrower. This simplifies the windrowing operation and allows them to vary the windrow from overlapped to side-by-side formation to suit crop conditions or combine size.
2. The optional hydraulic control kit available in 1984 has a convenient cab console and comes complete with all hoses and installation instructions. The tractor needs only 9 gpm (0.68 L/s) of hydraulic capacity to operate with the hydraulic control kit. Oil temperatures measured during the hottest August weather were within safe limits.
3. Rubberized plastic drapers with fiberglass slats will be available in 1984.

The recommendations made through this PAMI report have greatly improved the performance of the Wallis PTL 130. PAMI tests have provided the farmer with a better quality product.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Modifications to improve crop feeding through the windrow opening.
2. Modifications to make removal and remounting of the rear draper platform more convenient.
3. Labelling the console switches to identify their functions.
4. Modifications to the draper tighteners to make them stronger, safer, and more convenient to adjust.
5. Supplying an operator manual with the machine.
6. Modifications to prevent damage to the angled front shield on the rear draper platform.
7. Modifications to prevent damage to the front draper.

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Project Engineer: M.E. Jorgenson

GENERAL DESCRIPTION

The Wallis PTL 130 Double Windrow Attachment mounts on the rear of a pull-type windrower. Crop is delivered from the windrower drapers onto the front draper of the attachment. The front draper delivers the crop to a lateral rear draper, which carries the windrow to either the right or left side.

The front draper is bolted at the front to the cutterbar and supported at the rear with chains. The rear draper platform is welded and clamped to the windrower frame and supported by two castor wheels. The castor wheels allow the Wallis PTL 130 to remain attached to the windrower while transporting. For long transport distances, the rear platform is removed and pulled lengthwise behind the windrower.

A tractor with three sets of remote hydraulic outlets is required to raise and lower the header and reel on the windrower, and to position the rear draper platform. An additional hydraulic outlet with priority flow is needed to power the two drapers on the attachment. With the optional hydraulic control kit, only one set of remote hydraulics is required. Switches on a console in the cab control the reel, header and drapers.

The test machine was equipped with a 54 in (1370 mm) wide front draper, a 48 in (1220 mm) wide rear draper, and optional hydraulic control kit and rear platform position cylinder.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The Wallis PTL 130 was mounted on an International Harvester 75 pull-type windrower with a 24 ft (7.3 m) cutterbar. It was operated in the conditions shown in TABLE 1 for 63 hours while windrowing about 726 ac (294 ha). It was evaluated for rate of work, quality of work, ease of operation and adjustment, power requirements, operator safety and suitability of the operator manual.

TABLE 1. Operating Conditions.

CROP	VARIETY	YIELD		HOURS	FIELD AREA	
		bu/ac	(t/ha)		ac	(ha)
Barley	Bonanza	60 to 65	(3.2 to 3.5)	37	423	(171)
	Klages, hail damaged	----	----	3	32	(13)
Wheat	Neepawa	30 to 38	(2.0 to 2.6)	19	220	(89)
	Neepawa, hail damaged	----	----	4	51	(21)
TOTAL				63	726	(294)

RESULTS AND DISCUSSION

RATE OF WORK

Travel speeds and rate of work depended on the windrower size. With the 24 ft (7.3 m) windrower, average speeds were 4 to 6 mph (6 to 10 km/h). In straight even crop stands, travel speeds up to 6.5 mph (11 km/h) resulted in a uniform windrow. In heavy stands or ripe, dry crops, speed was reduced to less than 5 mph (8 km/h) due to plugging in the windrow opening. The average rate of work varied from 9 to 13 ac/h (3.6 to 5.3 ha/h).

QUALITY OF WORK

Draper: Draper speeds could be varied with the hydraulic flow control valve from 0 to 821 fpm (0 to 4.1 m/s). In most wheat and barley crops, a speed of 420 fpm (2.1 m/s) was suitable. In tall or ripe crops, higher speeds were required. Frequent plugging occurred if draper speeds were too slow. Slightly bunched or tangled windrows were formed if draper speeds were too high, as the windrow was pulled apart.



FIGURE 1. Plugged Front Draper.

Crop material from the windrower drapers was carried to the opening and dropped onto the front draper. In tall or ripe crops, plugging occurred as material caught on the side shields in the windrower opening (FIGURE 1). Plugging was reduced by lowering the front draper with the chains to provide more clearance beneath the windrow opening. It is recommended that the manufacturer consider modifications to improve crop feeding through the windrow opening.

In uniform crops, crop material flowed smoothly from the front draper onto the rear draper. The angled front shield on the rear draper platform prevented crop material from snagging. The rear draper then carried the crop material to the left or right side.

The weight of the front draper on the windrower table did not affect table flotation.

Windrow Formation: Windrow types (FIGURE 2) formed by the Wallis PTL 130 depended on the type and maturity of the crop, the type of windrower used, and the placement of the second windrow. Windrows were usually parallel or angled parallel depending on the direction of crop lean.

The rear draper platform could be positioned to form overlapped or side-by-side double windrows (FIGURE 3). With the 24 ft (7.3 m) windrower, double windrows had to be partially overlapped or the second windrow would lay in the stubble flattened by the tractor tire. Side-by-side windrows could be formed when following another windrower not equipped with a double windrow attachment.

Alternate stubble heights for snow trapping could be formed with the Wallis PTL 130 by cutting taller stubble when laying the second windrow. This was possible since the windrow was not laid on the tall stubble.

FIGURES 4 to 8 show typical windrows formed by the Wallis PTL 130.

FIGURE 9 shows a typical corner formed when laying a double windrow with the Wallis PTL 130. The rear draper could be shut off, when turning, to lay a windrow which was easily picked up. The dotted lines in FIGURE 9 show the path of the windrow if the draper was not shut off.

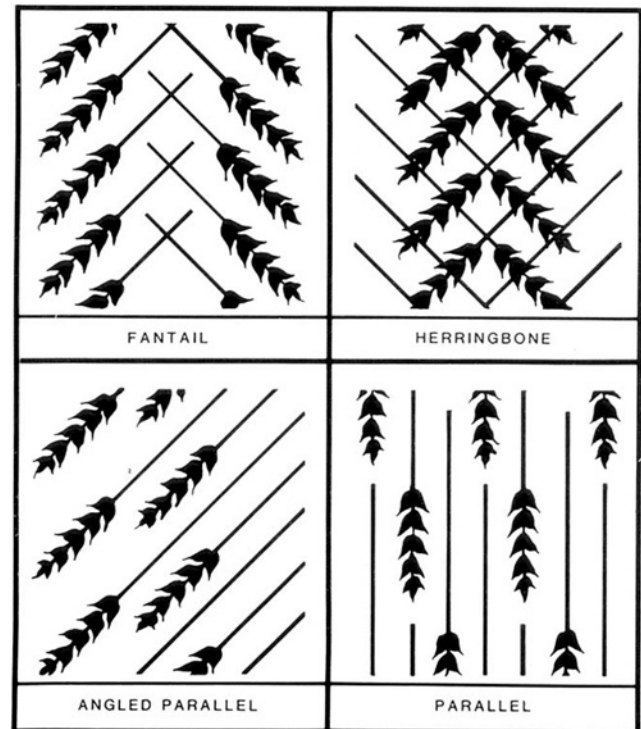


FIGURE 2. Windrow Types.

Windrow Uniformity: In most crops, windrows were uniform provided the crop was conveyed smoothly through the windrow opening. Tall or dry crops frequently plugged as material snagged on the side shields in the windrower opening. Plugging was reduced by decreasing travel speed or increasing the draper speed.

When turning with the rear draper stopped, bunching could be prevented by slowing down just before the corner. This reduced the amount of crop material carried on the rear draper during the turn.

EASE OF OPERATION AND ADJUSTMENT

Installation and Removal: The Wallis PTL 130 was assembled and installed on the pull-type windrower by two men in about 8 hours. The assembly instructions were clear, concise, and well illustrated, however, no assembly instructions were included for the optional hydraulic control kit. A welder, power drill and standard hand wrenches were required.

The front draper and rear draper platform were removed for normal windrower operation by one man in about 1-1/2 hours. The reel and table lift hoses had to be disconnected from the hydraulic control kit and connected to the tractor remote outlets. Remounting the attachment took one man about 2 hours. Removal and remounting were difficult. The rear draper platform had to be jacked into position and the mounts carefully lined up. It is recommended that the manufacturer consider modifications to make removal and remounting more convenient.

Controls: The reel and table lift, rear draper platform position and rear draper motor direction could be controlled using either the tractor remote hydraulic levers or the switches on the console provided with the optional hydraulic control kit. The switches were very convenient to use, but were not labelled for easy identification. It is recommended that the manufacturer consider labelling them.

When the optional hydraulic control kit was not used, four tractor remote hydraulic outlets were required to operate the windrower and attachment. One of these outlets had to provide priority flow for operating the two drapers. If this priority flow outlet was not provided, the drapers would slow down or stop when the reel or platform was raised.

Handling: The Wallis PTL 130 followed well over rolling topography such as ravines and sharp hill crests. With the rear draper platform slid to the right, some skewing occurred on moderate hills or in soft soils. The rear draper platform clearance was too low to cross windrows. Also, the left end of the rear draper platform protruded beyond the tractor making it difficult to maneuver around obstructions such as trees, fences, and rock piles. When laying the second windrow of a double windrow, there was limited room for the tractor between the crop edge and the first windrow (FIGURE 10). When using another windrower to lay the first windrow, tractor clearance was improved, as the windrow was laid further to the left.

Transporting: The Wallis PTL 130 transported well at speeds up to 20 mph (32 km/h) on most roads. For normal moves, the attachment could be left on the windrower (FIGURE 11). The attachment had to be partially pulled into the ditch when meeting traffic, however, caution was required as ground clearance was limited.

For long distance transport, the rear draper platform was removed from the windrower and towed lengthwise behind the windrower or another vehicle. It took one man about 40 minutes to remove the platform, bolt on the hitch and reposition a wheel.

Adjustments: Draper speeds were very easy to adjust using the flow control valve.

Draper tension was difficult to adjust and maintain. The front draper tightener (FIGURE 12) was located underneath the cutterbar and was difficult and dangerous to tighten. The rear draper tightener was easy to reach, but difficult to tighten because the draper was so long. The tightener locks were weak and failed to hold on several occasions. It is recommended that the manufacturer consider modifications to the draper tighteners to make them stronger, safer, and more convenient to adjust.

The back of the front conveyor was easily raised or lowered by adjusting the supporting chain. The rear draper platform clearance from the front draper was adjusted by repositioning bolts and sliding the platform.

Servicing: Daily servicing took about 5 minutes. Two grease fittings on the castor wheels needed greasing daily. The hydraulic motor couplings had to be checked daily for wear which was difficult as the couplers were covered by shields.

Because of the many hydraulic components on the windrower and attachment, it was very important to check the tractor hydraulic oil level frequently.

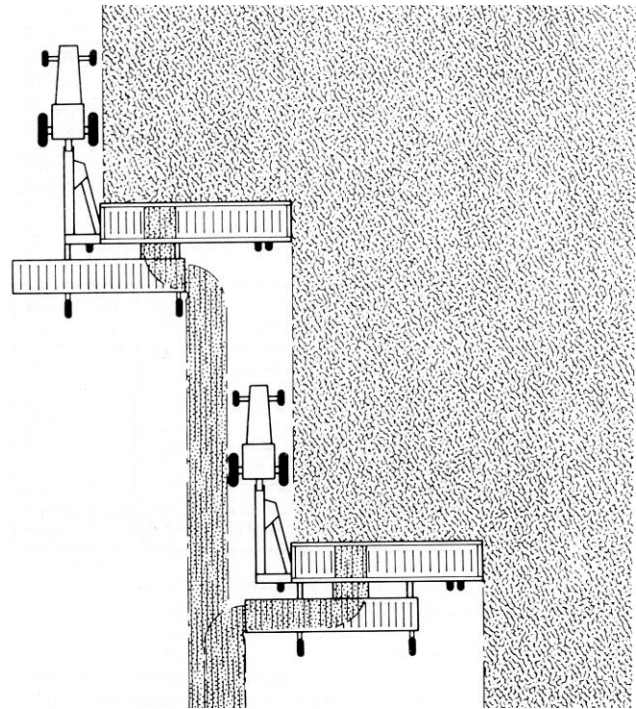


FIGURE 3. Double Windrowing.



FIGURE 4. Wheat, Single Windrow: 30 bu/ac (2.0 t/ha).



FIGURE 5. Wheat, Double Windrow, Side-by-Side: 30 bu/ac (2.0 t/ha).



FIGURE 6. Barley, Single Windrow: 65 bu/ac (3.5 t/ha).



FIGURE 7. Barley, Double Windrow, Side-By-Side: 65 bu/ac (3.6 t/ha).



FIGURE 8. Wheat, Double Windrow, Overlapped: 30 bu/ac (2.0 t/ha).

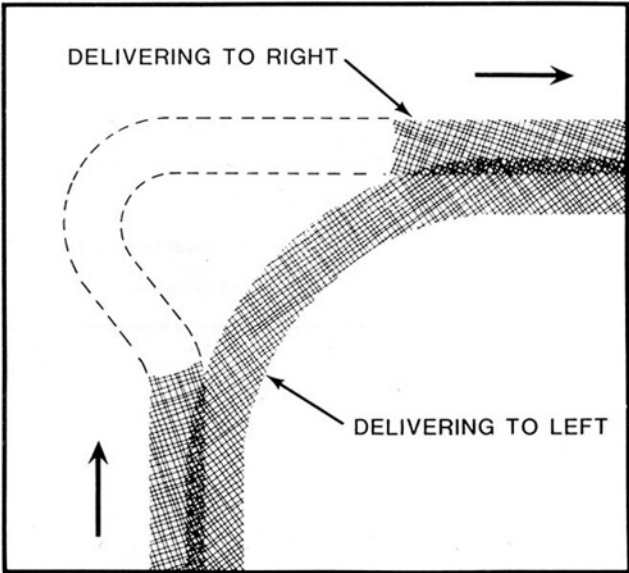


FIGURE 9. Typical Corner Formation.



FIGURE 10. Limited Tractor Clearance.



FIGURE 11. Transport Position.



FIGURE 12. Front Draper Tightener Location.

POWER REQUIREMENTS

A 60 hp (45 kW) tractor should have ample power to operate the windrower and Wallis PTL 130 in most field conditions. A maximum of 8.5 hp (6.3 kW) was required to operate the front and rear drapers in most cereal crops. With the optional hydraulic control kit, a tractor capable of supplying at least 8.3 gpm (0.63 L/s) of oil at a pressure of 2000 psi (13.8 MPa) was needed. Since many smaller tractors are not designed to operate continuously at high pressures and flow rates, it is important to check with the tractor manufacturer to ensure that the tractor hydraulic system is adequate. Without the hydraulic control kit, a tractor with three sets of remote hydraulic outlets was required. An additional set with priority flow was required to operate the two drapers on the attachment.

OPERATOR SAFETY

The Wallis PTL 130 was safe to operate if proper safety procedures were followed. No safety instructions or warning decals were supplied.

The front draper tightener was dangerously located beneath the cutterbar. It was inconvenient to have to block the windrower table to safely perform adjustments. Modifications to make draper tightening safer and more convenient have been recommended.

A slow moving vehicle sign was provided with the attachment.

OPERATOR MANUAL

An operator manual was not available for the Wallis PTL 130. It is recommended that the manufacturer consider supplying an operator manual.

Concise and well illustrated assembly instructions and a complete parts list were supplied with the machine.

DURABILITY RESULTS

The Wallis PTL 130 was operated for 63 hours while windrowing about 726 ac (294 ha). The intent of the test was evaluation of functional performance. An extended durability evaluation was not conducted. TABLE 2 outlines the mechanical failures that occurred during functional testing.

DISCUSSION OF MECHANICAL PROBLEMS

Angled Front Shield: When sliding the rear draper platform to the extreme right, the angled front shield hit the front draper hydraulic motor and was bent. It is recommended that the manufacturer consider modifications to prevent damage to the angled front shield.

Front Draper: The front draper was torn when the splice and the wooden slats caught on the sharp edges of the roller guides and skid plate. Cutting off the splice at the ends to make it narrower than the draper improved the performance somewhat. Also, the slats broke because the upper guide did not provide sufficient support for the draper. It is recommended that the manufacturer consider modifications to prevent damage to the front draper.

TABLE 2. Mechanical History.

ITEM	OPERATING HOURS	EQUIVALENT FIELD AREA	
		ac	(ha)
The angled front shield on the rear draper platform was bent when it caught on the front draper motor at	The beginning of the test		
The front draper tightener handle broke off while tightening at	3	30	(12)
The front draper tore near the splice and was repaired at	4	120	(49)
A seal failed on the front draper motor, The motor was replaced at	5	160	(65)
The front draper splice was damaged and replaced at	10	250	(101)
The skid plate began to crack near the roller mounts and was welded at	26	325	(132)
Most wood slat ends on both drapers were chipped or cracked	During the test		
The front draper tore and was replaced at	47	556	(225)
The o-ring seal on the return line tee fitting began to leak and was replaced at	58	675	(273)
The flexible coupling on the rear draper drive motor failed and was replaced at	62	700	(283)

APPENDIX I

SPECIFICATIONS

MAKE: Wallis
MODEL: PTL 130
SERIAL NUMBER: 1983 130-01
MANUFACTURER: REM Manufacturing Ltd.
 P.O. Box 1207
 Swift Current, Saskatchewan
 S9H 3X4

DRAPERS:
 - material canvas with wood slats
 - speed range 0 to 821 fpm (0 to 4.1 m/s)
 - roller diameter
 - drive rollers 2.6 in (66 mm)
 - tension rollers 2.3 in (58 mm)
 - front
 - draper length 6.2 ft (1.9 m)
 - draper width 54 in (1370 mm)
 - height adjustment supporting chain length
 - rear
 - draper length 22 ft (6.7 m)
 - draper width 48 in (1220 mm)
 - position adjustment manually clamped or cylinder operated on a slide rail
 - adjustment range 7 ft (2.1 m)

HYDRAULIC SYSTEM:
 - flow rate 8.3 gpm (0.63 L/s)
 - Operating pressure 2000 psi (13.8 MPa)
 - draper drive
 - type Rollor Stator hydraulic motors
 - motor size 2 in³/rev (32 cm³/rev)
 - rear draper platform position double acting cylinder
 - control
 - optional hydraulic control kit 4 switches activating solenoid valves from one set of tractor remote hydraulic outlets
 - direct tractor control 3 sets of remote hydraulic outlets and another set having priority flow

DIMENSIONS:

	FIELD POSITION	TRANSPORT POSITION
- added windrower length	10.1 ft (3.1 m)
- added windrower width	6.8 ft (2.1 m)	7.7 ft (2.3 m) (rear platform to left)
- wheel tread	13.9 ft (4.2 m)	10.1 ft (3.1 m)
- ground clearance (rear platform)	11.5 in (292 mm)	11.5 in (292 mm)

TIRES:
 - number 2
 - size JR78-15 retreads

WEIGHT:
 - attachment
 - left wheel 320 lb (146 kg)
 - right wheel 320 lb (146 kg)
 - added windrower weight
 - hitch pin 377 lb (171 kg)
 - left wheel 472 lb (214 kg)
 - right wheels 25 lb (11 kg)
 TOTAL 1514 lb (688 kg)

OPTIONAL EQUIPMENT:
 - hydraulic control kit
 - rear platform position cylinder

APPENDIX II

MACHINE RATINGS

The following rating scale is used in Machinery Institute Evaluation Reports:

excellent	fair
very good	poor
good	unsatisfactory

APPENDIX III

CONVERSION TABLE

IMPERIAL UNITS	MULTIPLY BY	SI UNITS
Acres (ac)	0.405	Hectares (ha)
Bushels/Acre (bu/ac) - wheat	0.0672	Tonnes/Hectare (t/ha)
- barley	0.0538	Tonnes/Hectare (t/ha)
Cubic Inches (in ³)	16.0	Cubic Centimetre (cm ³)
Feet (ft)	0.305	Metres (m)
Feet per Minute (fpm)	0.005	Metres/Second (m/s)
Gallons per Minute (gpm)	0.076	Litres/Second (L/s)
Horsepower (hp)	0.75	Kilowatts (kW)
Inches (in)	25.4	Millimetre (mm)
Miles per Hour (mph)	1.61	Kilometres/Hour (km/h)
Pounds (lb)	0.454	Kilograms (kg)
Pounds per Square Inch (psi)	6.89	Megapascals (MPa)

SUMMARY CHART

WALLIS PTL 130 DOUBLE WINDROW ATTACHMENT

Retail Price - \$6,989.00 (March, 1984, f.o.b. Humboldt, Sask.)

	EVALUATION	COMMENTS
RATE OF WORK		
Average Speed	4 to 6 mph (6.4 to 9.7 km/h)	- depends on windrower size and crop conditions
Average Work Rate	9 to 13 ac/h (3.6 to 5.5 ha/h)	
QUALITY OF WORK		
Draper	good	- smoothly conveyed uniform crops - some plugging in tall and very ripe crops
Windrow Formation		- parallel windrows predominant - overlapped or side-by-side double windrows
Windrow Uniformity	very good to poor	- very good in straight, clean crops - poor in tall or very ripe crops due to bunching and plugging
EASE OF OPERATION AND ADJUSTMENT		
Installation and Removal	good	- instructions were adequate - removal and remounting was difficult
Controls	good	- switches were convenient but not labelled - followed ground contours well - attachment did not have to be removed for short moves
Handling	very good	
Transporting	good	
Adjustments	good	- pulled into ditch to meet traffic - draper speed very easy to adjust - draper tighteners difficult to adjust
Servicing	good	- daily servicing took 5 minutes
POWER REQUIREMENTS	60 hp (45 kW) tractor	- must supply at least 8.3 gpm (0.63 L/s) at 2000 psi (13.8 MPa)
OPERATOR SAFETY	fair	- front draper tightening was dangerous
OPERATOR MANUAL		- not available
CAUTION:		
<p>This summary chart is not intended to represent the final conclusions of the evaluation reports. The relevance of the ratings is secondary to the information provided in the full text of the report. It is not recommended that a purchase decision be based only on the summary chart.</p>		

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3000 College Drive South Lethbridge, Alberta, Canada T1K 1L6 Telephone: (403) 329-1212 FAX: (403) 329-5562 http://www.agric.gov.ab.ca/navigation/engineering/afmrc/index.html	Test Stations: P.O. Box 1060 Portage la Prairie, Manitoba, Canada R1N 3C5 Telephone: (204) 239-5445 Fax: (204) 239-7124
	P.O. Box 1150 Humboldt, Saskatchewan, Canada S0K 2A0 Telephone: (306) 682-5033 Fax: (306) 682-5080