

EVALUATION REPORT

325



KEEP SHEAR RKS CROP DIVIDER

A Co-operative Program Between



KEER SHEAR RKS CROP DIVIDER

MANUFACTURER AND DISTRIBUTOR:

Danio Products Ltd.
 Bay 4 - 4380 76 Avenue S.E.
 Calgary, Alberta
 T2C 2J2

RETAIL PRICE:

\$917.00 (January, 1984, f.o.b. Humboldt, with hydraulic motor, mounting hardware, and optional flow control valve).

SUMMARY AND CONCLUSIONS

Overall Performance: Overall functional performance of the Keer Shear RKS was excellent in ail crops tested.

Quality of Work: Quality of work was excellent. Crop losses m rapeseed and flax were negligible. Windrow bunching did not occur.

Installation: Ease of installation was very good. The Keer Shear was easily removed for storage when not in use.

Power Requirements: Operating speed ranged from 250 to 400 rpm. Required power ranged from 0.4 to 1.0 hp (0.3 to 0.8 kW). Hydraulic oil flow at the recommended speed was 3.3 gal/min (0.25 L/sec). Maximum operating hydraulic pressure was about 500 psi (3450 kPa).

Ease of Operation and Adjustment: Ease of operation was very good. The blades picked up small stones and wet soil that occasionally stopped the chain. Ease of adjustment was excellent. Three height positions were easily obtained by relocating two bolts. The chain tension was easy to adjust.

Operator Safety: The drive mechanism was totally enclosed. There were no safety decals to warn operators of the danger of the rotating blades.

Operator Manual: There were few installation instructions. No operator manual was available.

Mechanical History: The drive sprocket keeper loosened and fell off. No serious mechanical problems occurred.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Providing more complete installation instructions and an operator manual with the machine.
2. Modifications to reduce chain stoppages in fields with small stones and wet soil conditions.
3. Affixing a decal to the powered divider to warn operators of the potential danger of the rotating blades.

Senior Engineer: G.E. Frehlich

Project Engineer: M.E. Jorgenson

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. New detailed installation instructions will be included with future units. A new operator manual is being printed.
2. We have not received complaints of small stones stopping the chain. In some of the fields where the crop divider was tested, the rapeseed was fiat on the ground. However, in most fields, the cutter can be kept 4 to 6 in (100 to 150 mm) above the ground.
3. For the 1984 season, a decal will be placed on the cutter to warn the operator to stay clear when the cutter is in motion.

GENERAL DESCRIPTION

The Keer Shear RKS is a powered divider attachment, which replaces the left or right divider rod on combine or windrower headers. It consists of sickle blades attached to a roller chain that rotates inside a metal enclosure. Metal plates on the leading face of the enclosure provide the cutting edge for the sickles. The blades rotate upwards to lift the crop while cutting.

The chain is driven by a hydraulic motor, which is powered by the tractor or windrower hydraulic system. Chain speed is adjusted

by an optional flow control valve. A pump, valves and hoses are also available as an option from the manufacturer.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The Keer Shear was mounted on the right divider of a Co-op Implements 742 self-propelled windrower. It was operated in the conditions shown in TABLE 1 for 62 hours while windrowing about 1156 ac (468 ha). It was evaluated for ease of installation, quality of work, power requirements, ease of operation and adjustment, operator safety, and suitability of the operator manual.

TABLE 1. Operating Conditions

Crop	Operation	Average Yield		Hours	Field Area	
		bu/ac	t/ha		ac	ha
Flax	Cutting	11	0.7	5	80	32
Rapeseed	Cutting	25 - 30	1.4 - 1.7	7	70	28
Wheat	Cutting	20 - 38	1.4 - 2.6	24	436	177
	Shielded	20 - 38	1.4 - 2.6	16	370	150
Tall Wheat Grass	Shielded	-	-	2	40	16
Barley, Damaged by Hail	Cutting	-	-	8	160	65
Total				62	1156	468

RESULTS AND DISCUSSION

EASE OF INSTALLATION

It took one man about three hours to install the Keer Shear. It was easily mounted to the windrower divider, however, mounting bolts, nuts and washers were not supplied. The Keer Shear hydraulic motor and optional flow control valve were connected in series with the right draper motor of the windrower. A sales pamphlet and a sketch of a suggested hydraulic circuit were the only instructions provided. It is recommended that the manufacturer provide more complete installation and operating instructions.

A power drill and hand wrenches were required for installation, along with about 52 ft (16 m) of 1/2 in (13 mm) hydraulic hose, one flow control valve, several fittings and adapters.

QUALITY OF WORK

Crop Loss: The Keer Shear lifted and cut the crop edge resulting in negligible losses in all crops tested. The standard divider rod separated the crop by pushing it down into the knife. This left a patch of flattened crop, which was retrievable only by cutting in the opposite direction on the next pass.

Windrow Uniformity: The Keer Shear eliminated bunching caused by material building up on the divider. The resulting windrows were slightly better than the windrows obtained with the standard divider. FIGURE 1 shows a windrow formed with the Keer Shear. Bunching problems may also be reduced by using a pickup reel with the standard dividers.

Rapeseed: The Keer Shear eliminated hairpinning in all stands of rapeseed leaving a clean, standing crop edge (FIGURE 2).



FIGURE 1. Windrowing Rapeseed with the Keer Shear Attachment.

Flax: After 55 hours of use, the blades were not sharp enough to cut all the flax stems cleanly. This problem was overcome by increasing the speed of the Keer Shear from the manufacturer's recommended 250 rpm to about 400 rpm. Hairpinning and bunching did not occur at the higher speed.

Cereal Crops: The Keer Shear cut well and left a clean edge

in all cereal crops. In straight standing cereal crops, the Keer Shear was not required and a cover could be placed over the blades (FIGURE 3). However, in lodged or leaning cereal crops, the cover flattened some of the crops. Some stalks also hairpinned on the blunt cover face.



FIGURE 2. Crop Edge Left by the Keer Shear in Rapeseed.



FIGURE 3. Operating the Keer Shear in Wheat with the Cover in Place.

POWER REQUIREMENTS

Power required to run the Keer Shear was 0.4 to 1.0 hp (0.3 to 0.8 kW). The hydraulic oil flow required to operate the Keer Shear at a speed of 250 rpm was 3.3 gal/min (0.25 L/s). Hydraulic pressure during normal operation was less than 500 psi (3450 kPa). Most hydraulic systems on tractors and self-propelled windrowers can supply this oil flow without affecting the performance of other hydraulically driven components.

EASE OF OPERATION AND ADJUSTMENT

When operated in stony or wet fields, the Keer Shear picked up wet soil and 1/2 to 1-1/2 in (13 to 32 mm) stones. These occasionally wedged between the sickle blades and guides, stopping the chain (Figure 4). The Keer Shear had to be mounted high enough to keep it out of the soil. However, this reduced its cutting ability in crops, which were low to the ground. It is recommended that the manufacturer consider modifications to prevent stones from wedging between the sickles and guides.



FIGURE 4. Keer Shear Stopped by Small Stone.

The blades also jammed between the guides if the chain was too loose. Maintaining proper chain tension prevented this problem. The hydraulic drive provided adequate protection against damage

when the sickle blades became jammed.

The Keer Shear could be easily removed or adjusted vertically by removing two bolts on the upper leg of the mounting bracket. The three vertical adjustments and the cutterbar height were adequate for all crops encountered.

The speed of the Keer Shear was easily adjusted with the optional flow control valve. The oil flow was easily shut off and the cover quickly installed when cutting was not required.

Clearance between the sickle blades and the metal plates was not adjustable. Chain tension was easily adjusted by sliding the bottom sprocket up or down.

Occasional oiling of the chain and daily checking of the chain tension was the only servicing required. The inside shield was easily removed for access to the chain and sprockets.

OPERATOR SAFETY

The Keer Shear drive components were adequately shielded. However, it is recommended that the manufacturer affix a decal on the powered divider to warn operators of the potential danger of the rotating blades.

OPERATOR MANUAL

The only instructions provided were sales literature and a hydraulic circuit sketch. An operator manual was not available. The manufacturer had to be consulted for proper operating instructions. It is recommended that more complete installation instructions and an operator manual be supplied with the Keer Shear.

DURABILITY RESULTS

The Keer Shear RKS was operated in the field for 62 hours. The intent of the test was evaluation of functional performance. An extended durability evaluation was not conducted.

Only one mechanical problem occurred during the tests. The bolt and washer on the drive sprocket keeper fell off after 6 hours of operation.

The Keer Shear body occasionally contacted the reel as the windrower divider flexed and vibrated in rough fields. No damage occurred, but on some windrowers the windrower divider may have to be reinforced to avoid damage.

**APPENDIX I
SPECIFICATIONS**

MAKE: Keer Shear
MODEL: RKS
SERIAL No: 20283
MANUFACTURER: Danio Products Ltd.
 Bay 4 - 4380 76 Avenue S.E.
 Calgary, Alberta T2C 2J2

DIMENSIONS:

-- height 36 in (914 mm)
 -- width
 - overall 7-3/4 in (197 mm)
 - body 1-3/4 in (44 mm)
 -- length 14 in (356 mm)
 -- mass
 - shear 48 lb (22 kg)
 - shear plus mount 61 lb (28 kg)

CUTTER:

-- cutting length 32 in (813 mm)
 -- sickle blades
 - number 8
 - width 3 in (76 mm)
 - length 3-1/4 in (83 mm)
 -- height adjustment 3 at 2 in (51 mm) increments

DRIVE:

-- type hydraulic motor
 -- operating speed 250 rpm

OPTIONAL EQUIPMENT:

-- flow control valve
 -- modular control valve, 1 way or 2 way
 -- self-contained hydraulic pump
 -- hoses and fittings

**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)	0.40	Hectares (ha)
10 Bushels/Acre (bu/ac)	- wheat 0.69	Tonnes/Hectare (t/ha)
	- barley 0.56	Tonnes/Hectare (t/ha)
	- rapeseed 0.57	Tonnes/Hectare (t/ha)
	- flax 0.65	Tonnes/Hectare (t/ha)
Inches (in)	25.4	Millimetres (mm)
Pounds (lb)	0.45	Kilograms (kg)
Horsepower (hp)	0.75	Kilowatts (kW)
Gallons/Minute (gpm)	0.076	Litres/Second (L/s)
Pounds per Square Inch (psi)	6.89	Kilopascals (kPa)

SUMMARY CHART

KEER SHEAR RKS CROP DIVIDER

RETAIL PRICE: \$917.00

(January, 1984, f.o.b. Humboldt, with hydraulic motor, monitoring hardware, and optional flow control valve.)

	<u>EVALUATION</u>	<u>COMMENTS</u>
OVERALL PERFORMANCE	Excellent	
QUALITY OF WORK	Excellent	- windrow bunching did not occur - negligible losses in rapeseed and flax
EASE OF OPERATION AND ADJUSTMENT		
Installation	Very Good	- about 3 hours for 1 man
Operation	Very Good	- small stones jammed between sickle blades and guides
Adjustment	Excellent	- dependent on windrower and hydraulic hook-up
POWER REQUIREMENTS		
Operating Speed	250 to 400 rpm	
Hydraulic Oil Flow	3.3 gpm (0.25 L/s)	- at 250 rpm
Power	0.4 to 1.0 hp (0.3 to 0.8 kW)	
OPERATOR SAFETY	Very Good	- drives shielded - no warning decals
OPERATOR MANUAL	Poor	- few instructions provided - no operator manual 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 on the summary chart.</p>		

 <p>ALBERTA FARM MACHINERY RESEARCH CENTRE</p>	<p>Prairie Agricultural Machinery Institute Head Office: P.O. Box 1900, Humboldt, Saskatchewan, Canada S0K 2A0 Telephone: (306) 682-2555</p>		
<p>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</p>	<table> <tr> <td> Test Stations: P.O. Box 1060 Portage la Prairie, Manitoba, Canada R1N 3C5 Telephone: (204) 239-5445 Fax: (204) 239-7124 </td> <td> P.O. Box 1150 Humboldt, Saskatchewan, Canada S0K 2A0 Telephone: (306) 682-5033 Fax: (306) 682-5080 </td> </tr> </table>	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
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