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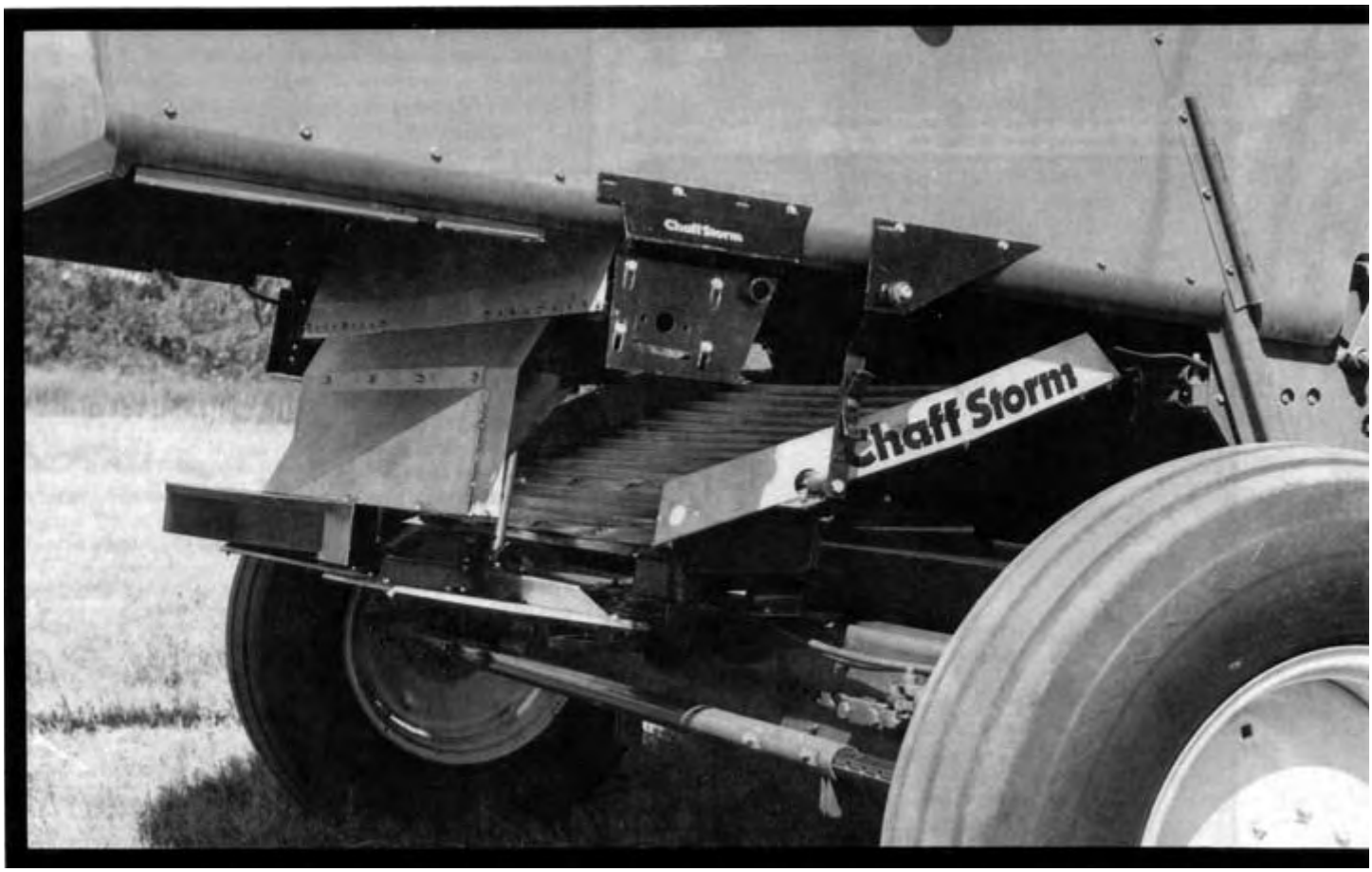

Chaff Storm Chaff Spreading Attachment

A Co-operative Program Between
ALBERTA FARM MACHINERY RESEARCH CENTRE
PAMI
PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

CHAFF STORM CHAFF SPREADING ATTACHMENT

MANUFACTURER:

Keith Industries Inc.
3 Winfield Way
Winnipeg, Manitoba
R2R 1V8

DISTRIBUTORS:

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P.O. Box 1720
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Keith Industries Inc.
3 Winfield Way
Winnipeg, Manitoba
R2R 1V8

RETAIL PRICE:

$1365.00 (May, 1985, f.o.b. Humboldt, Saskatchewan. Model CS8820, suitable for mounting on a John Deere 8820 combine.

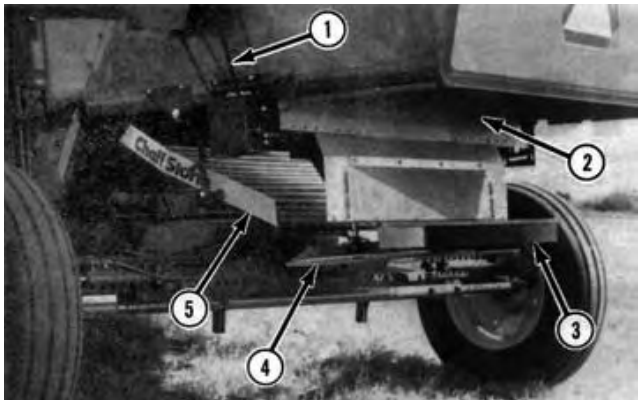

FIGURE 1. Chaff Storm: (1) Drive Belt, (2) Upper Deflector Shield, (3) Rear Deflector Shield, (4) Chaff Spreading Discs, (51 Chaff Pan.

SUMMARY AND CONCLUSIONS

Quality of Work: In dry average conditions, the Chaff Storm spread chaff 20 ft (6.1 m). The uniformity of the spread pattern was very good, with the chaff being spread evenly over the spread width.

Capacity: The Chaff Storm had sufficient capacity to spread ail of the chaff from the John Deere 8820 combine while harvesting at a maximum acceptable feedrate in all crops.

Ease of Installation: Ease of installation was very good. The Chaff Storm was easily installed by two men in five hours. Installation instructions were clear and welt illustrated. Remounting the combine's grain loss monitor sensors was required.

Ease of Operation and Adjustment: Ease of adjusting the Chaff Storm was very good. The deflector shield could easily be raised or lowered behind the chaff spreading discs to adjust the spread pattern.

Ease of adjusting the combine's cleaning shoe was poor with the Chaff Storm installed. The chaff pan and chaff spreading discs restricted access to the combine shoe, making shoe adjustments difficult and inconvenient.

No servicing or lubrication was required.

Ease of cleaning was fair. Chaff from the spreading discs collected on the rear axle support under the chaff pan and was inconvenient to clean. Also, the upper deflector shield filled with chaff and was difficult to clean.

Power Requirements: Power required to operate the Chaff Storm was 0.5 hp (0.4 kW).

Safety: All spreading devices for combines are potentially dangerous. The Chaff Storm operator's manual emphasized operator safety. Drives were adequately shielded.

Operator's Manual: The operator's manual was very good. It was well organized, clearly written, and well illustrated. It contained much useful information.

Mechanical History: No mechanical problems occurred during testing.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Modifying the chaff pan to improve access to the combine shoe for easier chaffer and sieve adjustment.

Senior Engineer: G.E. Frehlich

Project Technologist: A.R. Boyden

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. This recommendation will be considered in future designs. The manufacturer has already introduced a more readily detachable sieve mount connection for the chaff pan on some other models.

GENERAL DESCRIPTION

The Chaff Storm chaff spreading attachment mounts at the rear of a combine to spread the chaff from the cleaning shoe (see APPENDIX I for applicable combines). A pan attached to the rear of the cleaning shoe conveys chaff to two spreading discs (FIGURE 1). Fins on the discs accelerate the material while the rear deflector shield directs material away from the combine. The spreading discs are driven through a 90 degree gear drive from a common shaft that is belt driven from the combine's rear straw walker shaft.

Specifications for the Chaff Storm are given in APPENDIX I.

SCOPE OF TEST

The Chaff Storm was mounted on a John Deere 8820 combine. It was operated in the conditions shown in TABLE 1 for about 37 hours while harvesting 380 ac (153.8 ha). It was evaluated for quality of work, capacity, ease of installation, ease of operation and adjustment, power requirements, operator safety, and suitability of the operator's manual.

TABLE 1. Operating Conditions

Crop	Hours	Field Area	
		ac	ha
Barley	4	30	12.1
Rye	16	160	64.8
Wheat	17	190	76.9
Total	37	380	153.8

RESULTS AND DISCUSSION

QUALITY OF WORK

Spreading Width: In dry average conditions, the Chaff Storm spread chaff 20 ft (6.1 m). With heavy damp chaff, the maximum spread width was 28 ft (8.5 m). The widest chaff spread was obtained with the deflectors lowered around the spreading discs.

The spread pattern of the Chaff Storm, like other spreaders, is greatly affected by crosswinds.

Spreading Uniformity: Depending on adjustment, the uniformity of chaff spreading was very good. In most crop conditions, the chaff was spread uniformly over about 20 ft (6.1 m). A typical chaff spread pattern is shown in FIGURE 2. The coefficient of variation (CV)[1] was 19 percent and was well within the acceptable limit. The uniformity of the spread pattern may differ considerably with field conditions and machine adjustments.

CAPACITY

The Chaff Storm had sufficient capacity to spread all of the chaff from the John Deere 8820 combine while harvesting at a maximum acceptable feedrate in all crops.

[1]The coefficient of variation (CV) is the standard deviation of the material in each successive 24 in (508 mm) section across the spread pattern expressed as a percent of the average amount of material in a section. The lower the CV, the more uniform is the spread pattern.

EASE OF INSTALLATION

Ease of installation was very good. The Chaff Storm was easily installed on the John Deere 8820 by two men in about five hours. Assembly instructions were clear and concise, and well illustrated. No special tools were required.

The chaff pan was easy to install but required remounting the combine's grain loss sensors. The drive channel assembly and sheet metal deflectors were easily assembled and installed, provided the parts illustrations in the operator's manual were used. The drive components were also easily installed. All components were received with adequate mounting hardware.

EASE OF OPERATION AND ADJUSTMENT

Spreader Adjustment: Ease of adjusting the Chaff Storm was very good. The deflector shield could easily be raised or lowered behind the chaff spreading discs to adjust the spread pattern. The rear end of the chaff pan was adjustable. No adjustments were required after it was set for the combine.

Combine Adjustment: Ease of adjusting the combine's cleaning shoe was poor with the Chaff Storm installed (FIGURE 3). The chaff pan and chaff spreading discs restricted access to the combine shoe. The operator had to remove the chaff spreading discs and climb onto the chaff pan to view the chaffer and sieve. Also, the combine shoe was difficult and inconvenient to adjust with the chaff pan in place. It is recommended that the manufacturer modify the chaff pan to allow easy access to the combine shoe.

FIGURE 3. Limited Access to Shoe Adjustments.

Servicing: No greasing was required. Only periodic checks were required for proper belt tension, loose bolts, or worn parts.

Cleaning: Ease of cleaning was fair. Chaff from the spreading discs collected under the chaff pan on the combine's axle support, making cleaning inconvenient. Also, the upper deflector shield filled with chaff and was difficult to clean. The upper deflector shield was very close to the front of the existing straw chopper. This area also filled with chaff when the chopper knives were not engaged.

POWER REQUIREMENTS

Power required to operate the Chaff Storm in typical conditions was 0.5 hp (0.4 kW).

SAFETY

All spreading devices for combines are potentially dangerous to operate. Extreme care is required when working near them to prevent possible injury from flying stones or other objects.

The Chaff Storm operator's manual emphasized operator safety. Drives were adequately shielded.

OPERATOR'S MANUAL

The operator's manual was very good. It was well organized, clearly written, and well illustrated. It contained a parts list, useful information on safe operation, installation, adjustment, and maintenance.

MECHANICAL HISTORY

The intent of the test was evaluation of functional performance. An extended durability test was not conducted. No mechanical problems occurred during the 37 hours of testing.

APPENDIX I
SPECIFICATIONS

MAKE:	Chaff Storm Chaff Spreading Attachment
MODEL:	CS8820
MANUFACTURER:	Keith Industries Inc. 3 Winfield Way Winnipeg, Manitoba R2R 1V8
DIMENSIONS:	
-- spreader assembly	
- maximum height	36 in (914 mm)
-maximum width	75.5 in (1918 mm)
-maximum length	26 in (660 mm)
-- chaff pan size	45 x 61.2 in (114 x 1554 mm)
-- spreading disc diameter	23.2 in (590 mm)
-- spreading disc height	1.2 in (30 mm)
TYPE:	chaff pan directs chaff from the shoe onto spreading discs
DRIVE SYSTEM:	
-- type	belt driven from rear straw walker shaft
-- spreading disc speed	580 rpm
COMBINES AVAILABLE FOR:	
-- Allis Chalmers Gleaner	L3, L2, L
-- John Deere	8820, 7720, 7721, 7701, 6620, 6601
-- Massey Ferguson	860, 850, 852, 851, 760, 750, 751

APPENDIX II
MACHINE RATINGS

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

excellent	fair
very good	poor
good	unsatisfactory

SUMMARY CHART
CHAFF STORM CHAFF SPREADING ATTACHMENT

RETAIL PRICE	$1365.00 (May, 1985, f.o.b. Humboldt, Saskatchewan. Model CS8820, suitable for mounting on a John Deere 8820 combine).
QUALITY OF WORK	
Spreading Width	20 ft (6.1 m) chaff spread in average conditions
Spreading Uniformity	**Very Good;** depends on adjustment and conditions
CAPACITY	Sufficient for maximum acceptable feedrates
EASE OF INSTALLATION	**Very Good;** was installed by two men in 5 hours
EASE OF OPERATION AND ADJUSTMENT	
Spreader Adjustment	**Very Good;** the chaff deflector shield was easily adjusted
Combine Adjustment	**Poor;** access to the shoe of the combine was restricted by the chaff pan
Servicing	No lubrication required
Cleaning	**Fair;** upper deflector shield filled with chaff and was difficult to clean
POWER REQUIREMENTS	0.5 hp (0.4 kW)
SAFETY	Operator's manual emphasized operator safety; drives were shielded
OPERATOR'S MANUAL	**Very Good;** contained much useful information and was well written
MECHANICAL HISTORY	No failures occurred during the test

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