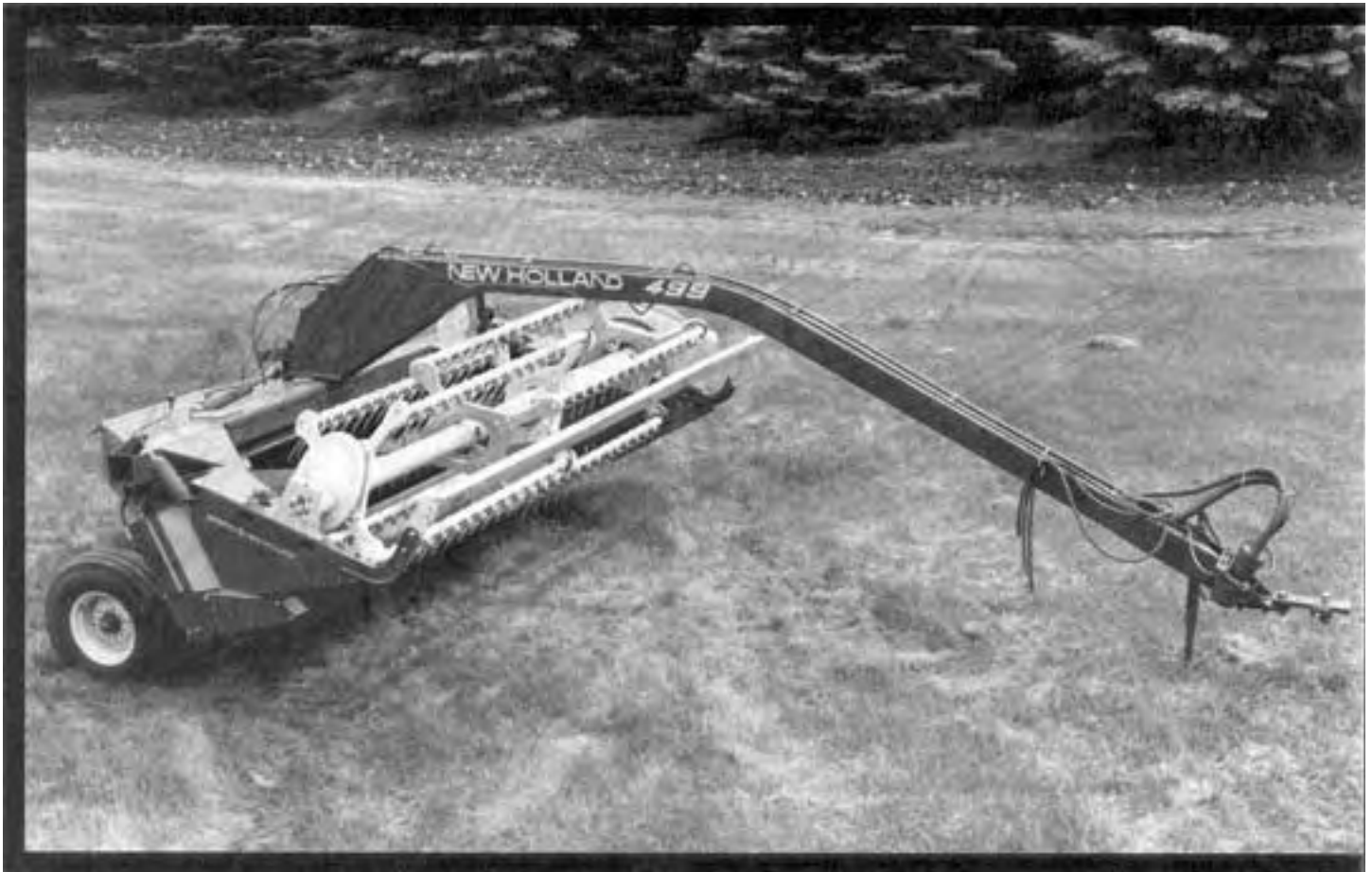


Evaluation Report

524



New Holland 499 Mower-Conditioner

A Co-operative Program Between



NEW HOLLAND 499 MOWER-CONDITIONER

MANUFACTURER:

New Holland
500 Diller Ave.
New Holland, Penn.
17557 U.S.A.

DISTRIBUTOR:

New Holland
Box 1616, Station M
Calgary, Alberta T2P 2M7
(403) 273-6771

RETAIL PRICE:

\$13,568.81 (February, 1987 f.o.b. Portage la Prairie, Manitoba)
with spare knife.

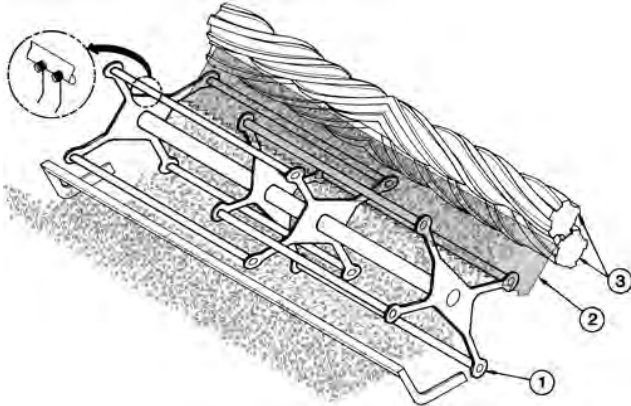


FIGURE 1. New Holland 499 Mower-Conditioner: (1) Reel, (2) Knife, (3) Conditioning Rollers.

SUMMARY AND CONCLUSIONS

Rate of Work: The typical continuous field speed varied from 4 to 6 mph (6.4 to 9.6 km/h). Typical continuous work rate varied from 6 to 9 ac/h (2.3 to 3.5 ha/h).

Quality of Work: Cutting ability was very good in all crops. Occasional plugging occurred in damp or fine stemmed crops.

Conditioner performance and windrow formation were very good in most crops.

Ease of Operation and Adjustment: The ease of operation and maintenance was good. Daily service and lubrication took approximately 15 minutes.

Power Requirements: A tractor with a minimum power take-off rating of 65 hp (49 kW) and two remote hydraulic outlets was required.

Operator Safety: The machine was safe to operate, maintain and adjust.

Operator's Manual: The operator's manual was very good. It contained useful information on operation, maintenance and adjustment.

Mechanical History: Only a few minor mechanical problems occurred during the test.

RECOMMENDATIONS:

It is recommended that the manufacturer consider:

1. Modifying the pivot hitch stops to allow the tractor to be centred over the windrow.

Station Manager: G.M. Omichinski

Project Engineer: C.W. Chapman

THE MANUFACTURER STATES THAT

With regard to the recommendation, the Model 499 is designed so the tractor can be centered over the previous windrow when cutting a normal width swath. We will try to determine why the tongue pivoted too far on your test machine.

GENERAL DESCRIPTION

The New Holland 499 is a 12 ft pull-type, 540 rpm, power take-off driven mower-conditioner. The rigid cutting platform uses a dual conventional reciprocating knife and a cam action converging reel. Two intermeshing rubber rollers crimp the crop. Rear shields form a windrow. The mower-conditioner is driven hydraulically by a pump mounted on the power take-off shaft.

The centre pivot hitch can be hydraulically positioned to allow the mower to cut directly behind or to the left or right of the tractor.

Detailed specifications are given in APPENDIX I and FIGURE 1 shows the location of the major components.

SCOPE OF TEST

The New Holland 499 was operated in the crops shown in TABLE 1 for 238 hours while harvesting 1124 acres (454 ha).

It was evaluated for quality of work, rate of work, ease of operation, power requirements, operator safety, and suitability of the operator's manual and mechanical history.

TABLE 1. Operating Conditions

Crop	Hours	Equivalent Field Area	
		ac	ha
Alfalfa	84.5	421	170
Mixed Hay	29.5	129	52
Heavy Grass	57	217	88
Alfalfa/Grass	37.5	215	87
Alfalfa/Brome	15.5	75	30
Oats/Grass	7	30	12
Millet	7	37	15
Total	238	1124	454

RESULTS AND DISCUSSION

RATE OF WORK

Typical continuous field speed varied from 4 to 6 mph (6.4 to 9.6 km/h) and the typical continuous work rates varied from 6 to 9 ac/h (2.3 to 3.5 ha/h).

Daily work rates are lower than continuous work rates, because continuous rates do not account for time due to turning, and other field irregularities.

Ground speed was limited by the cutting ability of the knife in most crops. In heavy damp fine stemmed crops ground speed was limited by the feeding ability of the conditioning rollers.

QUALITY OF WORK

Windrow Formation: The New Holland 499 produced good quality windrows in all crops as shown in FIGURE 2. Windrow formation and width were controlled by an adjustable gate inside the two rear shields.

The pivot hitch and centre delivery of the New Holland allowed continuous windrows to be formed around corners.



FIGURE 2. Windrow Formation in Heavy Crop [Alfalfa 4.5 ton/ac (10.0 t/ha)].

Cutting Ability: All tests were conducted with under serrated

knife sections. Cutting ability was very good in most hay crops if knife sections and guards were kept sharp and in good condition. Some plugging of the cutterbar occurred in fine stemmed or damp crops.

The centre pivot hitch allowed good cutting ability at corners, with no losses.

Forward speed was limited by cutting ability, especially in heavy or damp crops.

Stubble: The New Holland 499 produced ideal stubble in most crops if knife sections were kept sharp and header floatation was properly adjusted.

If knife sections were dull or header floatation was not properly adjusted, stubble became irregular. Cutting height was adjustable by lowering or raising the header skid shoes.

Floatation: Two adjustable springs provided header floatation. Header floatation was very good in all field conditions encountered.

Reel Performance: Reel performance was very good in all crops. The converging reel effectively fed all cut material from the cutter bar to the conditioning rollers. Reel position was adjustable to suit specific or adverse crop conditions. The reel position was not adjusted during the test.

Reel speed was variable from 40 to 66 rpm by adjusting the belt drive sheave. The factory set reel speed of 60 rpm was adequate for all crops tested.

Reel tooth movement was actuated by a cam, and was not adjustable. The converging reel effectively fed all cut material from the cutter bar to the conditioning rollers.

Conditioner Performance: The New Holland 499 was equipped with two rubber conditioner rollers, with an intermeshing herringbone design. Roller clearance could be adjusted by adding or removing shims and roller pressure was adjusted by a crank located on the right hand of the machine acting on torsion bar springs.

The operator's manual recommended that 90% of the stems and 5% of the leaves show conditioning effect in legume crops, like alfalfa.

Conditioner performance was very good in all crops. Feeding was aggressive in most crops. In heavy crops of fine grass some hesitant feeding occurred and limited capacity.

The purpose of a conditioner is to reduce curing time by crimping the plant stems allowing moisture to escape. This results in more uniform drying.

FIGURE 3 compares the effect of conditioning of the New Holland 499 with a windrower without a conditioner. The use of a conditioner will likely permit baling one-half to one day earlier.

Much variation in drying time can be expected due to weather conditions at the time of curing.

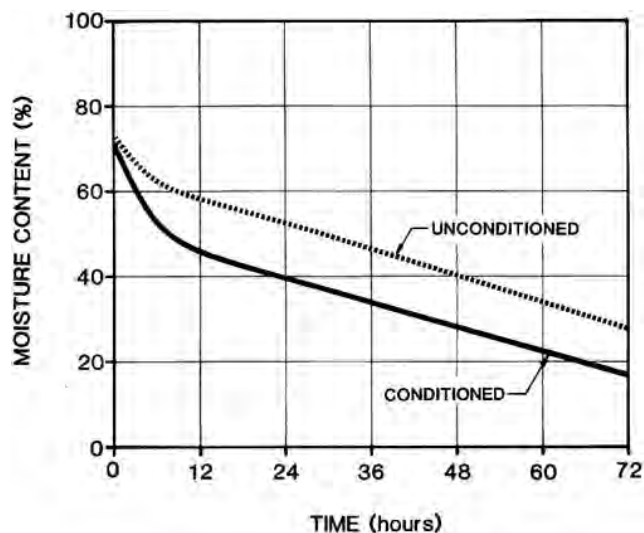


FIGURE 3. The effect of conditioning in alfalfa at 3.5 ton/ac (7.8 t/ha).

Leaf Loss: Leaf loss from the New Holland 499 was negligible. The uniform drying of conditioned crop also reduces leaf loss in baling.

EASE OF OPERATION AND ADJUSTMENT

Hitching: The New Holland 499 was equipped with a drawbar hitch extension, which was bolted to the tractor drawbar.

The hydraulic pump which powered the mower-conditioner was installed on the 540 rpm power take-off shaft. A torque arm and chain kept the pump from rotating. Mounting of the pump to the tractor PTO was difficult, due to the weight of the pump and of stiffness of the hydraulic hoses.

Controls: Two remote hydraulic outlets, one for raising and lowering the mower-conditioner and one for swinging the hitch, were required.

For smooth operation, the hydraulic outlet for swinging the hitch should be of the variable flow type. When operating the New Holland 499 in the extreme left hand or right hand position it was not possible to centre the tractor over the adjacent windrow. It is recommended that the manufacturer consider modifying the hitch stops to allow the tractor to be centred over the windrow.

Transporting: The New Holland 499 transported by moving the hitch to the centre position and engaging the transport locking pin. Safety latches held the mower-conditioner in the raised position.

The mower-conditioner transported well at all tractor speeds and had adequate ground clearance.

The New Holland 499 was equipped with a slow moving vehicle sign.

Adjustments: Reel speed was adjusted by varying the two halves of the belt drive sheave. Lower reel speeds were available using an optional speed reducing kit.

Adjusting the conditioning roller pressure was easy, using a crank mechanism. Roller clearance could be adjusted by adding or removing shims.

Floatation springs were easily adjusted by loosening the lock nuts and turning the spring bolts, then tightening the lock nuts.

Cutting height was easily adjusted by lowering or raising the skid shoes. Cutting height was adjustable from 1.3 to 6.3 in (30 to 60 mm).

The New Holland 499 was equipped with an optional spare knife, which was stored in the frame tube of the machine. This allowed for easy knife repair by removing the damaged knife and replacing it with the spare knife.

Windrow formation was easily adjusted by lowering a gate inside the two rear shields to form wider windrows.

Lubrication: The New Holland 499 was equipped with 17 pressure grease fittings, which required lubrication every 10 hours and 3 pressure fittings requiring lubrication every 50 hours.

One chain required lubrication every 10 hours. Three gearboxes should be checked weekly and the lubricant changed seasonally. The hydraulic oil reservoir should be checked every 100 hours and the filter changed seasonally.

All pressure grease fittings and other lubrication points were easily accessible, complete daily and weekly lubrication took approximately 15 minutes.

POWER REQUIREMENTS

Over the range of test operating conditions, average power take-off requirement for the New Holland 499 in alfalfa was 32 hp (24 kW) and peak power requirement was 43 hp (32 kW). Average drawbar power at 6 mph (10 km/h) was 11 hp (8 kW).

A tractor with a power take-off rating of 65 hp (49 kW) would be sufficient to operate the New Holland 499 in most typical prairie conditions.

OPERATOR SAFETY

The New Holland 499 was safe to operate and service providing common sense was used and the manufacturer's recommendations were followed.

OPERATOR'S MANUAL

The operator's manual was concise, clearly written and contained useful information on operation, maintenance and safety.

MECHANICAL HISTORY

TABLE 2 outlines the mechanical history of the New Holland 499. The intent of this project was a functional evaluation of the machine and an extended durability evaluation was not conducted.

TABLE 2. Mechanical History

Item	Operating Hours	Equivalent Field Area	
		ac	(ha)
-Individual knife sections or guards were damaged and replaced at	17, 13, 27, 71, 100, 102, 106, 166, 237	33, 61, 128, 330, 473, 482, 500, 785, 1124	(13, 24, 51, 132, 190, 192, 200, 314, 454)
-The O-ring in the rear main drive hydraulic pressure hose was leaking and replaced at	106	501	(200)
-Several pick-up teeth were loose and tightened at	228	1078	(431)

APPENDIX I SPECIFICATIONS:	
MAKE:	New Holland
MODEL:	499
SERIAL NUMBER:	501064
HEADER:	
-- width of cut (divider points)	12.7 ft (3.9 m)
-- effective cut (inside dividers)	12.2 ft (3.7 m)
-- range of cutting height	1.3 to 6.3 in (30 to 160 mm)
-- guard spacing	3 in (75 mm)
-- length of knife section (under serrated)	3 in (75 mm)
-- knife speed	850 cycles/min
REEL:	
-- number of bats	2 sets of 4 (total of 8)
-- bat action	cam action, converging
-- number of reel arms per bat	2
-- diameter	3.6 ft (1.1 m)
-- number of teeth/bat	15 bat teeth spacing 5 in (130 mm) reel speed range 37 to 61 rpm
-- optional kit	31 to 51 rpm
-- reel position adjustment	
-fore and aft	4.0 in (100 mm)
-height above cutter bar	1.0 in to 3.0 in (25 to 75 mm)

CONDITIONING ROLLERS			
-- number	2		
-- material	moulded rubber (intermeshing)		
-- length	9.2 ft (2.8 m)		
-- diameter	10.5 in (270 mm)		
-- speed of rolls	673 rev/min		
OVERALL DIMENSIONS:		Field Position	Transport Position
-- length		17 ft (5.2 m)	21.7 ft (6.6 m)
-- width		18.8 ft (5.7 m)	13.8 ft (4.2 m)
WEIGHT:		Field Position	Transport Position
	Left Side	Right Side	
-- left wheel	2518 lb (1142 kg)	1213 lb (550 kg)	1971 lb (894 kg)
-- right wheel	1040 lb (472 kg)	2315 lb (1050 kg)	1746 lb (792 kg)
-- hitch	1045 lb (474 kg)	1075 lb (488 kg)	886 lb (402 kg)
Total	4603 lb (2088 kg)	4603 lb (2088 kg)	4603 lb (2088 kg)
TIRES:			
-- number/size	2, 11 L x 14, 4-ply		
SERVICING:			
-- grease fittings	17, every 10 hours 3, every 50 hours		
-- chains	1, every 10 hours		
-- wheel bearings	2, seasonally		
-- gear box(s)	3, change oil seasonally		

SUMMARY CHART NEW HOLLAND 499 MOWER-CONDITIONER

RETAIL PRICE:	\$13,568.81 (June 1987, f.o.b. Portage la Prairie, MB)
RATE OF WORK:	Very Good 4 to 6 mph (6.4 to 9.6 km/h; 6 to 9 ac/h (2.3 to 3.5 ha/h)
QUALITY OF WORK:	Very Good cutting and conditioning performance in most crops.
POWER REQUIREMENTS:	65 hp (49 kW) 540 rpm power take-off required.
EASE OF OPERATION:	Easy to operate, adjust and maintain.
OPERATOR SAFETY:	Very Good
OPERATOR MANUAL:	Very Good
MECHANICAL HISTORY:	Only minor mechanical problems.



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