

EVALUATION REPORT 357



John Deere 7000 Max-Emerge Row Crop Planter

A Co-operative Program Between



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PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

JOHN DEERE 7000 MAX-EMERGE ROW CROP PLANTER

MANUFACTURER:

John Deere Plow and Planter Works
501 3rd Avenue
Moline, Illinois
61265 U.S.A.

DISTRIBUTOR:

John Deere Ltd.
455 Park Street
Regina, Sask.
S4N 5B2

RETAIL PRICE: \$39,199 (March 1984, f.o.b. Portage la Prairie, Manitoba) with front folding tool bar, 8 seed units with finger pickup metering system, granular fertilizer hoppers, seed unit down pressure springs, chain shields and Computer Track 300 monitor.

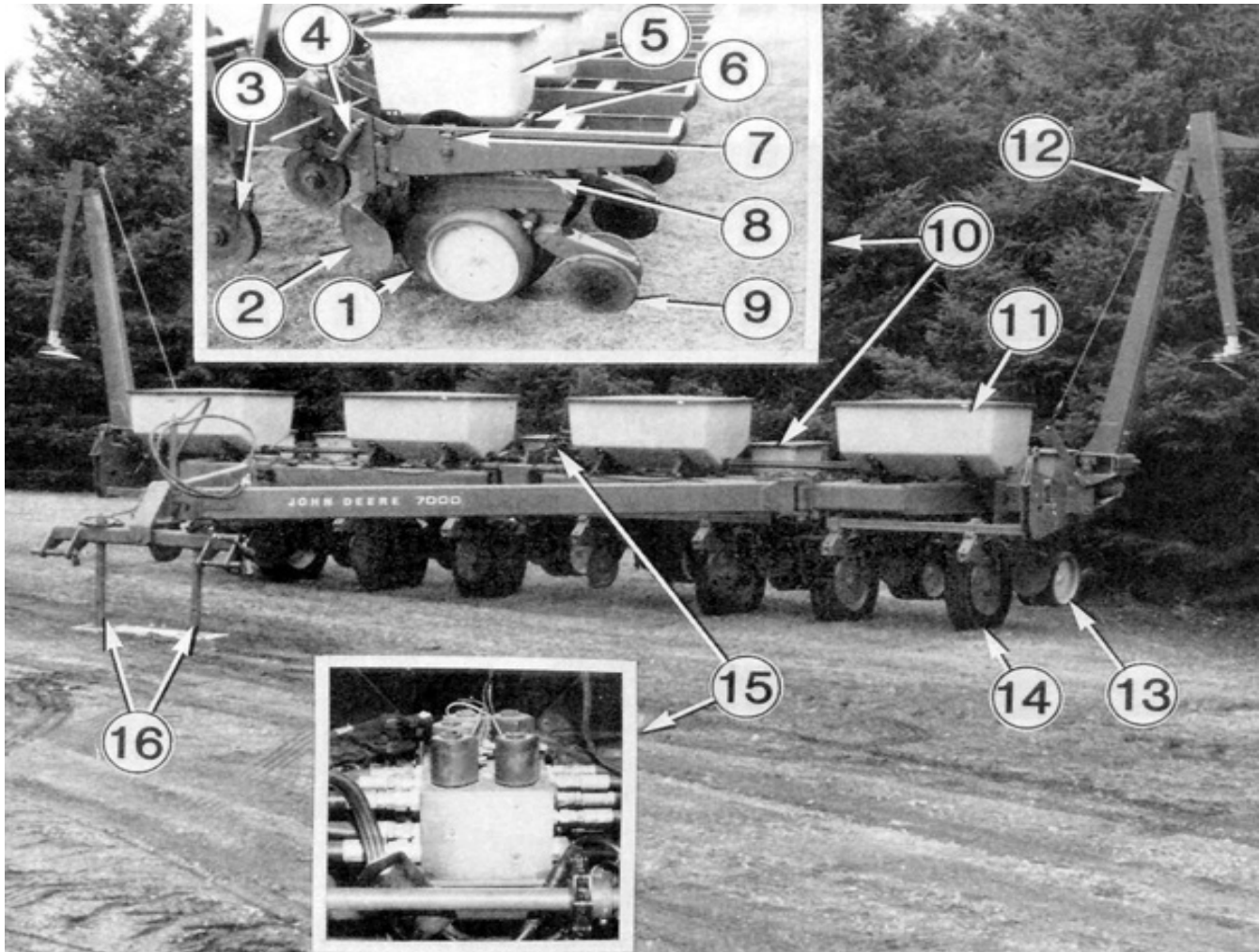


FIGURE 1. John Deere 70(X) Max-Emerge: (1) Seed Disk Openers, (2) Disk Furrowers, (3) Fertilizer Disk Openers, (4) Down Pressure Springs, (5) Seed Hopper, (6) Seed Hopper Latch, (7) Seed Drive Release Mechanism, (8) Depth Control Adjustment, (9) Closing Wheels, (10) Seed Unit, (11) Granular Fertilizer Hoppers, (12) Hydraulic Row Markers, (13) Depth Gauge Wheels, (14) Ground Wheels, (15) Solenoids, (16) Safety Stands.

SUMMARY AND CONCLUSIONS

The functional performance of the John Deere 7000 Max-Emerge row crop planter was **very good**.¹

Seed Metering: The spacing of corn seed at 5 mph (8 km/h) using the finger pickup seed metering system was **very good**, particularly when planting medium round seed. However, spacing of large sunflower seed was only fair.

Increases in ground speed or when operating on slopes slightly decreased the accuracy of this metering system.

When using the "soybean feedcup" for planting soybeans and white beans, actual population rates were significantly higher than those stated in the operator manual.

Fertilizer Application: Actual fertilizer rates for the "regular rate" fertilizer augers were higher than those stated in the operator manual, especially at low rates.

Penetration: Penetration of the Tru Vee™ seed disk openers was **excellent** in all field conditions tested. However, penetration of the fertilizer disk openers was reduced in heavy clay soils.

Soil Finishing: Coverage of seed was **very good** and consistent, particularly at 5 mph (8 km/h) in tested field conditions. Two angled closing wheels packed the soil around the seed leaving loose soil on top of the seed.

Monitor: The monitor supplied with the test machine was very easy to read and provided a wide range of operating information. Either Imperial or SI (metric) units of measurement could be used.

¹See rating table APPENDIX II.

The ability of the monitor to detect seeding rates was *very good* in corn and sunflowers but unsatisfactory in soybeans and white beans.

Ground speed and area measurements were very accurate.

Ease of Operation and Adjustment: Seeding rates were very easy to adjust on the central seed drive sprocket transmission. Seeding depth was easily adjusted for each individual row.

Filling the fertilizer hopper was usually done from the back of the machine. Latches and holding straps for the hopper lids were very convenient and useful.

The John Deere 7000 Max-Emerge folding frame planter could be placed in transport position in minutes with minimal operator effort.

Power Requirements: A 90 HP (67 kW) tractor with a Category III narrow or a Category II hitch is the minimum tractor size recommended.

Operator Safety: The John Deere Max-Emerge was safe to operate provided normal safety precautions were observed. Front-end tractor weights were necessary to maintain tractor stability.

Operator Manual: The operator manual was *excellent*. Clear illustrations and easy to read text were used to aid the operator in the safe and proper use and maintenance of this machine.

Mechanical Problems: Problems occurred with the electrical harness on the folding frame and was replaced. The scrapers for the fertilizer disk openers had a wear life of only 535 acres (215 ha).

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Recalibrating the soybean planting rate chart in the operator manual.
2. Recalibrating the fertilizer rate chart at low application rates.
3. Increasing the downward force exerted by the fertilizer disk openers to improve penetration in heavy clay soils.
4. Increasing the rate of lowering the row markers to the ground.
5. Improving the monitor and sensing devices for monitoring crops such as soybeans and edible beans.
6. Undertaking a study to determine if the electrical harness is being pinched or is stretched, in the folding frame.
7. Rerouting or covering monitor wires on the tool bar to protect them from being tread upon by the operator when filling the fertilizer hoppers.
8. Improving the quality of the fertilizer disk opener scrapers for longer wear life.

Senior Engineer: G.M. Omichinski

Project Engineer: C.W. Bolton

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. The rate charts have been developed for a typical soybean size. We recognize that the seed size can vary so we recommend the operator manual rates be used as starting points. The user should check the actual planting rate in the field.
2. Fertilizer composition can vary widely, and our charts were calculated for a bulk density of 65 lbs per ft³ (1401 kg/m³). These rates should be used as a starting point and adjusted as needed in the field.

This suggestion will be given consideration in future design.

The marker lowering rate was selected for safe operation and protection of the markers.

5. This suggestion will be given consideration in future designs.
6. This has not been a problem when the harness has been properly installed.
7. The wires can be re-routed at the operator's discretion, but we do not recommend walking on the main frame for safety reasons.
8. This suggestion will be given consideration in future designs.

GENERAL DESCRIPTION

The eight row wide, John Deere 7000 Max-Emerge tested (FIGURE 1) is a semi-mounted, row crop planter designed to plant crops such as corn, sunflowers, beans and sorghum.

The eight seed units, spaced 36 in (91 cm) apart are mounted on the back of the tool bar. Each unit consists of a 1.6 bu (58 L) fiberglass seed hopper, a Finger Pickup seed metering device, two seed disk openers, two depth gauge wheels and two closing wheels.

The Finger Pickup metering device (FIGURE 2) used to plant all sizes of corn seed and large sunflowers is located in the bottom of the seed hoppers. These devices consist of 12 spring loaded cam-operated fingers which rotated against a stationary vertical disk or carrier plate. The fingers close and trap kernels as they rotate through the small seed reservoir formed by the seed baffle. Surplus kernels escape, as the fingers pass over two small indentations and a nylon brush at the top of the carder plate. The seed then passes through an opening in the carder plate to a 15 celled seed belt. The belt carries the seed down to the curved seed delivery tube. The seed travels down the delivery tube to the ground by gravity.

The drive power for these seed metering devices is generated by the ground wheels and transmitted through the central seed drive sprocket transmission.

The seed disk openers or Tru-Vee™ openers are two sharply angled disks which cut a V-shaped trench in the soil. The depth of the trench is controlled by the depth gauge wheels. Once the seed is in the trench, angled closing wheels collapse the trench from the sides and firm the soil around the seed while leaving loose soil on top of the seed.

The planter is equipped with four 8.5 cu ft (240 L) fiberglass, granular fertilizer hoppers. Fertilizer is placed in the ground by spring loaded double disk openers. The rate of application is determined by selecting one of three feed rate augers and a desired sprocket combination on the fertilizer drive transmission.

The monitor, supplied with the planter, is the Computer Trak 300 (FIGURE 3) with a radar ground speed sensor. In addition to the visual display windows of the monitor, planting malfunctions are also signalled by an alarm. Parameters that can be measured by the monitor include sequentially scanning each row and displaying either the population rate or seed spacing for that row. The rows with the lowest and highest population rates and the average across the planter can be displayed. Ground speed, field area, and total area planted can also be monitored.

The planter is equipped with the front folding frame option for transporting.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST²

The John Deere 7000 Max-Emerge row crop planter was operated in various field conditions (TABLE 1) for about 115 hours while seeding 705 ac (285 ha) of corn and 145 ac (59 ha) of sunflowers. It was evaluated for quality of work, ease of operation and adjustment, rate of work, power requirements, operator safety and suitability of the operator manual.

In addition to field testing, the seed and fertilizer metering systems were tested for accuracy in the laboratory, on level and sloped operating conditions.

²Prairie Agricultural Machinery Institute Detailed Test Procedure for Row Crop Planters.

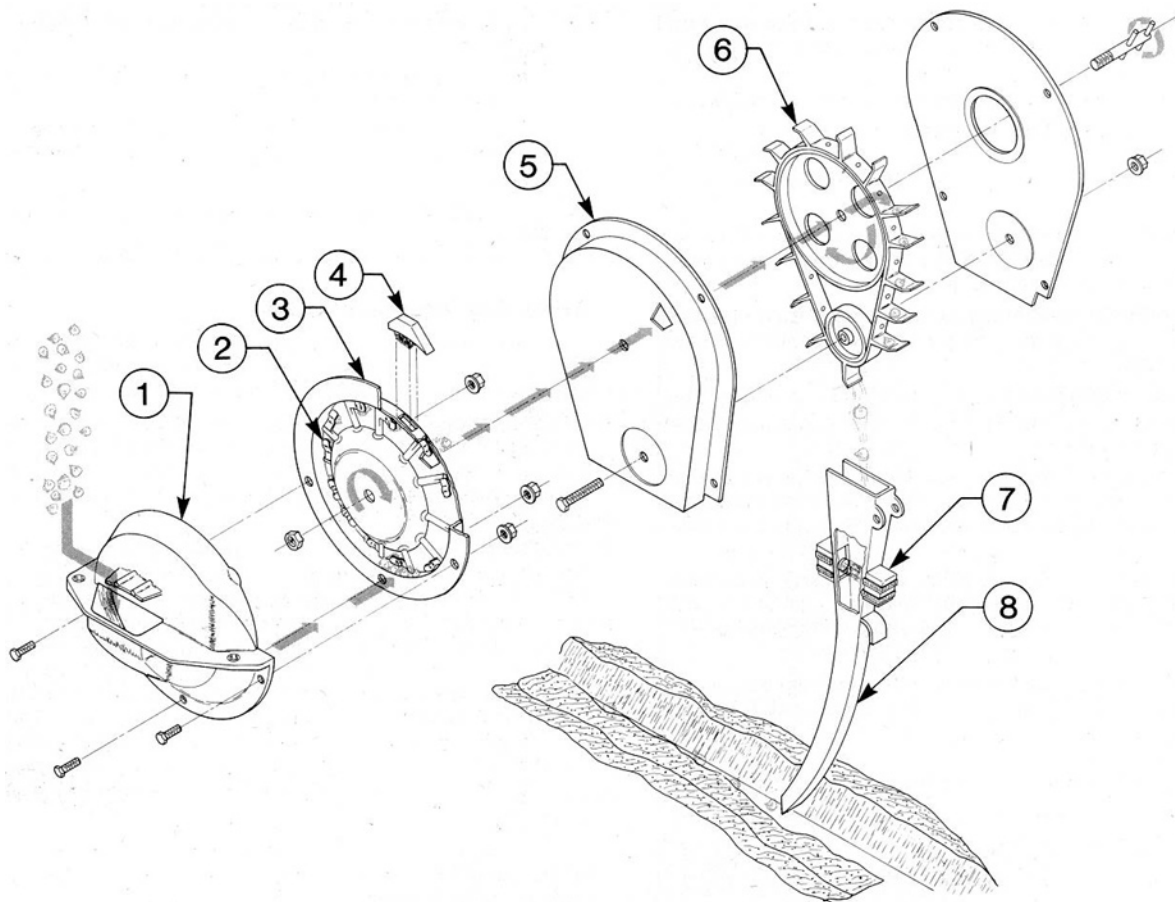


FIGURE 2. Finger pickup seed metering unit: (1) Seed Baffle, (2) Pickup Fingers, (3) Carrier Plate, (4) Meter Brush, (5) Seed Belt Housing, (6) Seed Belt, (7) Seed Sensor, (8) Seed Delivery Tube.

TABLE 1. Operating Conditions

FIELD CONDITIONS	HOURS	FIELD AREA ac (ha)	
Soil type:			
-- clay	44	305	(124)
-- clay loam	18	150	(61)
-- sandy loam	21	155	(63)
-- sand	32	240	(96)
Total:	115	850	(344)
Trash cover:			
-- heavy	16	110	(45)
-- light	52	380	(154)
-- none	47	360	(145)
	115	850	(344)

RESULTS AND DISCUSSION

QUALITY OF WORK

Seed Metering: Accuracy of the Finger Pickup metering system was tested in the laboratory using eight different samples of corn and a sample of large sunflowers. The ground speeds selected were 5 mph (8 km/h), considered an average planting speed, and the maximum speed recommended by the manufacturer for the crop and seeding rate being tested.

The results were recorded in terms of a Quality of Feed Index³. This index represents the percentage of seeds from the sample that were planted within the range of 0.5 to 1.5 times the desired seed spacing. TABLE 2 shows the Quality of Feed Index of eight different corn samples at a seeding rate of 21,800 seeds/ac (53,800 seeds/ha) on a level surface. The results did not vary significantly on different rows. An index of 95% or better was considered to be excellent.

TABLE 2. Quality of Feed Index Results for Corn

CORN SIZE	QUALITY OF FEED INDEX	
	5 mph (8 km/h)	7 mph (11 km/h)
Medium, Round	97	96
Small, Round	97	94
Large, Round	96	95
Medium, Flat	95	93
Large, Plateless	95	92
Large, Flat	94	91
Small, Plateless	95	89
Small, Flat	88	87

Medium, round seed gave the best results. At 5 mph (8 km/h) all seed samples except the large flat and small flat seed had a Quality of Feed Index of 95% or greater. More misses (spaces greater than 1.5 times the desired spacing) occurred when flat seed was used.

When the ground speed was increased to 7 mph (11 km/h) the Quality of Feed Index dropped 1% to 6% depending on the seed sample. This was caused by an increase in the number of doubles (spaces less than 0.5 times the desired spacing) occurring. Only the medium and large round seed had an index of 95% or greater at this speed.

The Quality of Feed Index for large sunflowers at a population rate of 20,200 seed/ac (49,900 seeds/ha), was only 88% at 5 mph (8 km/h) due to a large number of doubles. As the speed was increased to 7.5 mph (12 km/h) the number of doubles increased causing the planter to over populate and the Quality of Feed index to drop to 75%. This was considered to be poor.

To plant small white beans and soybeans, the "soybean feed-cup" was used in the bottom of the seed hopper instead of the Finger Pickup device. Test results for white beans at 5 mph (8 km/h) showed the overall population planted was 7% to 9% less than the rate stated in edible bean planting rate chart.

³International Organization for Standardization ISO/DIS 7256/1 Sowing Equipment-Method of Test-Part 1: Single Seed Drills (Precision Drills).

Tests results for soybeans showed planting rates were 20% higher than indicated in the soybean planting rate chart. It is recommended that the manufacturer consider recalibrating the soybean planting rate chart.

While operating at 5 mph (8 km/h) on 11 degree slopes, an increase in the frequency of doubles caused a decrease in the Quality of Feed Index by 2% to 3%. At 7 mph (11 km/h) the effect of the slope was greater especially when seed was sloped towards the Finger Pickup unit. This condition caused a large increase in the frequency of doubles thus dropping the Quality of Feed Index 10% to 20%. Flat seed was affected more than round seed.

The manufacturer recommended in the operator manual that in order to prevent planting miscalculations, field checks should be carried out when setting planting rates.

Fertilizer Application: The "regular rate" fertilizer auger was tested for metering accuracy in the laboratory. Allowing for differences in bulk densities, actual fertilizer rates were up to 34% greater than those given in the manual for low application rates. At higher settings the actual rates of application were 17% greater (TABLE 3).

TABLE 3. Fertilizer Rates

SETTING	MACHINERY INSTITUTE		MANUFACTURER		DIFFERENCE %
	lb/ac	(kg/ha)	lb/ac	(kg/ha)	
18 - 36	98	(111)	73	(82)	+34%
24 - 18	255	(288)	218	(246)	+17%
36 - 16	430	(486)	368	(416)	+17%

It is recommended that the manufacturer consider recalibrating the fertilizer rate chart at low application rates.

Operating up and down 11 degree slopes had no significant effect on fertilizer rates. However, while operating on 11 degree side slopes, 15% more fertilizer was delivered to downspouts at the lower end of the fertilizer hoppers when compared to operation on level ground. At the higher end of the hoppers, 5% less fertilizer was delivered to downspouts.

Penetration: Penetration of the seed disk openers was excellent in all field conditions tested. In sandy clays and loam, the penetration of the fertilizer disks was very good, however, in heavy clay soils, penetration was greatly reduced. In the "heavy soil" position, the vertical force of the fertilizer disk openers was 230 lbs (1020 N).

It is recommended that the manufacturer consider increasing the amount of force that can be exerted by the fertilizer disk openers.

Seeding Depth: Seed placement was very good in most field conditions. At 5 mph (8 km/h) nearly all the seed was placed within 0.5 in (13 mm) of the average seeding depth. At higher speeds and deeper seeding depth a slight increase in variation occurred.

Disk furrowers were used in heavy trash cover areas to push away excessive trash and to allow the seed disk opener to function normally. These furrowers were also used in dry sandy areas to remove the top layer of dry soil. This allowed the seed to be planted in moisture and still be close to the surface.

Soil Finishing: The angled closing wheels did a very good job in covering the seed. The soil was pushed around the seed from the sides, leaving a layer of loose soil on top. The amount of downward force exerted by these closing wheels was controlled by adjusting the spring tension.

Row Markers: The row markers were heavily constructed. The adjustable marker disk on the end of the row marker made clear consistent furrows for the operator to follow, in all field conditions tested.

The row marker could be quickly raised but was much slower to lower than the rest of the planter. It is recommended that the manufacturer consider increasing the rate of lowering the row markers.

Monitor and Control Systems: Overall performance of the Computer Trak 300 Monitor (FIGURE 3) and radar sensor unit supplied with the test machine was very good. All functions and

calculations could be done in either Imperial or SI (metric) units of measurement.



FIGURE 3. Computer Trak 300 Monitor.

The parameters monitored included: ground speed; field area; total area; seed population and spacing for a selected row; a scan of all eight rows showing the rows with the minimum and maximum seed population or seed spacing and also the average of eight rows.

Ground speed and area measurements were very accurate. Seed spacing and population counts for corn and sunflower seed were very precise if the sensors in the seed tubes were cleaned at least once a day. However, seed population counts for soybeans and white beans were very inaccurate and unsatisfactory. It is recommended that the manufacturer consider improving the monitor and sensing devices for monitoring soybeans and white bean planting rates.

The control box allowed the operator to raise and lower the planter, fold and unfold for transport, and manually or automatically select the desired row markers. Performance during the test was good.

Problems occurred with the electric harness preventing the planter from being unfolded from transport position. The harness was replaced and the problem did not occur again. Also several times during the test, the row markers did not properly alternate when in the automatic mode. However, manual selection worked during the entire test.

It is recommended that the manufacturer consider conducting a study to determine if the folding frame is pinching or stretching the electrical harness.

EASE OF OPERATION AND ADJUSTMENT

Hitching: The John Deere 7000 Max-Emerge was easy to hitch to a tractor equipped with a Category III narrow or Category II hitch or a Quick-Coupler unit. One remote hydraulic circuit was also needed. Hitching was completed by three electrical pin connectors for the monitor, control console and lights.

Application Rates: Planting rates were very easy to change. After loosening a chain tightener bracket and removing the rubber spacers (FIGURE 4) the desired combination of sprockets could be aligned by sliding the sprockets on the shafts. No storage was required for sprockets not being used. The spacers were then replaced and the chain retightened. Twenty-three different combinations were possible, with seed population rates for corn, ranging from 10,900 to 46,700 seeds/acre (27,250 to 116,750 seeds/ha).

The tension of the pickup fingers should be checked periodically, especially if a frequent number of doubles or misses begin occurring.

Changing the Finger Pickup unit to the feedcup unit for planting beans required only a few minutes per row.

The fertilizer rate was adjusted in a similar manner. Eleven different sprocket combinations were possible with rates ranging

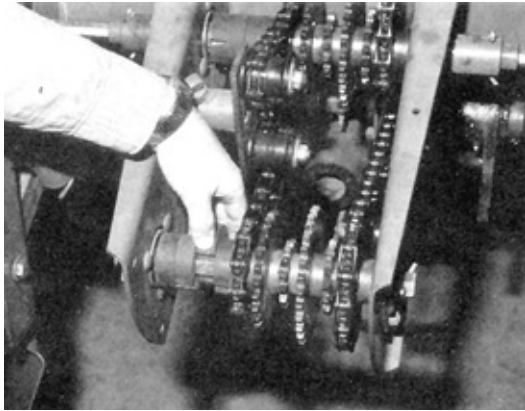


FIGURE 4. Seed Drive Transmission.

from 79 to 399 lb/ac (89 to 447 kg/ha) using the "regular rate auger" based on a fertilizer with a density of 65 lb/ft³ (1040 kg/m³). Two other augers were available which would allow the application rate to vary from 40 to 598 lb/ac (45 to 680 kg/ha). To change these augers, the fertilizer hoppers had to be nearly empty.

Depth Adjustment: Planting depth was controlled by the depth gauge wheels. To adjust the depth the planter had to be raised. The depth adjustment handle could then be easily moved in small increments to the desired setting. Seventeen settings were available. Because of variation in the seed planting units, the depth adjustment handles were not always in the same position on every row when attempting to plant at the same depth.

Lubrication: Access to most lubrication points was good with the planter in field position. A total of 119 lubrication points, including pressure grease fittings, oil points and chains, required servicing daily or weekly. A service schedule was provided in the operator manual.

To lubricate the Finger Pickup metering units, the manufacturer recommended sprinkling a teaspoon of powdered graphite on top of the seed twice a day.

Filling: The eight individual 1.6 bushel (58 L) seed hoppers at the rear of the machine were filled easily, especially when the planter was in a lowered position. A latch was conveniently provided on the underside of the lid allowing the operator to snap the lid to the front of the hopper while filling.

The four granular fertilizer hoppers were easy to fill from the back of the machine when the operator used a drill fill and stood on the tool bar to direct the flow of fertilizer. However, it was difficult to avoid treading on the wires laying on top of the tool bar. It is recommended that the manufacturer consider rerouting or covering these wires to protect them.

While filling the hoppers, the lids were held in front of the hoppers by rubber straps. This prevented the lids from becoming lost or damaged and was convenient for the operator.

Cleaning: The sensors in the seed tubes were cleaned daily using a small round brush with detergent and water. Also, the Finger Pickup units were inspected periodically and any chemical buildup from treated seed was removed.

The seed hoppers were easily removed from the seed units by disengaging the drive release mechanisms and unfastening the seed hopper latches. It took only a few minutes to empty each hopper.

To clean fertilizer hoppers, the operator had to disconnect the couplers to the fertilizer augers and the fertilizer downspout hoses. After two hopper support bolts at the rear of the hopper were removed, the hopper was tipped forward to remove the fertilizer.

Transporting: The 7000 Max-Emerge had excellent stability at 20 mph (32 km/h) on smooth roads. One person could easily put the planter in transport position (FIGURE 5) from field position in minutes with minimal effort. Additional time was necessary to remove four drive chains for long distance transporting. Trans-

port width was 13.8 ft (4.2 m) and transport height was 12.2 ft (3.7 m).

When transporting, the fertilizer hoppers were less than half full as stated in the operator manual, to prevent front-end instability of the tractor and excessive loading on the planter frame.



FIGURE 5. Transport position.

Power Requirements: Power requirements depended upon soil conditions, seeding depth and ground speed. Draft tests showed that a tractor with at least a 90 hp (67 KW) maximum power take-off rating based on Nebraska tractor test data, should be used to operate this machine. Tractor standby hydraulic pressure should be at least 2000 psi (13,790 kPa).

OPERATOR SAFETY

The John Deere 7000 Max-Emerge was safe to operate and service, if normal safety precautions were observed.

To maintain safe control of the tractor, a full set of weights mounted on the front of the tractor was required. Also when transporting, fertilizer hoppers were less than half full and all safety locks on the wing wheels, frame, and row markers were engaged.

OPERATOR MANUAL

The operator manual supplied with the test machine was excellent. Many clear photographs and illustrations were included with the text, providing useful, easy to understand information on maintenance, adjustment, service and safe operation of the machine.

Both Imperial and SI units of measurement were used in the manual.

DURABILITY

TABLE 4 outlines the mechanical history of the John Deere 7000 Max-Emerge row crop planter during 115 hours of operation while seeding 850 acres (340 ha).

TABLE 4. Mechanical History

ITEM	OPERATING HOURS	EQUIVALENT FIELD AREA ac (ha)
Hydraulic hose replaced at:	35	250 (100)
Spring for automatic marker control replaced at:	55	400 (160)
Electrical harness replaced at:	60	435 (175)
Scrapers on inside and outside of fertilizer discs replaced at:	70	535 (215)
Shear pin in right marker replaced at:	85	625 (250)
Row markers not always alternating automatically:	90	660 (265)

As shown in TABLE IV the scrapers used to keep the fertilizer disk openers free of mud were replaced after only being used for 535 ac (215 ha). It is recommended that the manufacturer consider improving the quality of these scrapers for longer wear-life.

The Finger Pickup units were inspected at the end of the test. The metering brushes would have required replacement after a few more hours of use. The carrier plate also showed signs of wear on the two indents and would require replacement after an estimated 100 hours of further use.

The intent of the test was evaluation of functional performance. An extended durability evaluation was not conducted.

APPENDIX I		
SPECIFICATIONS		
MAKE:	John Deere	
MODEL:	7000 Max-Emerge	
SERIAL NUMBER:	713256A	
DIMENSIONS:		
	<u>ft</u>	<u>(m)</u>
Transport:		
-- width	13.8	(4.2)
-- length	26.6	(8.1)
-- height	12.1	(3.7)
Effective planting width:	24.0	(7.3)
SEEDING SYSTEM:		
-- type	Plateless	
-- number of rows	8	
-- number of seed hoppers	8	
-- row spacing	36 in	(91.4 cm)
-- individual seed hopper capacity	1.6 bu	(58 L)
-- type of drive	chain driven from ground wheel	
-- type of adjustment	sprocket combinations	
-- seed disk opener diameter	15 in	(38 cm)
-- depth gauge wheel diameter	15 in	(38 cm)
-- dosing wheel diameter	12 in	(30 cm)
-- seed disk opener		
range of vertical force	180-280 lb	(800-1250 N)
-- closing wheel		
range of applied vertical force	40-85 lb	(180-380 N)
FERTILIZER SYSTEM:		
-- type	Auger	
-- number of rows	8	
-- number of fertilizer hoppers	4	
-- each fertilizer hopper capacity	8.5 ft ³	(0.24 m ³)
-- type of drive	chain driven from ground wheel	
-- type of adjustment	auger and sprocket combinations	
-- fertilizer disk opener diameter	15 in	(38 cm)
-- fertilizer disk opener		
maximum applied vertical force	230 lb	(1020 N)
TIRES:		
-- number	6	
-- size	7.6 x 15 SL, 6 ply	
NUMBER OF LUBRICATION POINTS:		
-- pressure grease fittings	48	
-- oil points	52	
-- sealed wheel bearings	6	
NUMBER OF CHAIN DRIVES:		
	19	
NUMBER OF HYDRAULIC CYLINDERS:		
	11	
OPTIONAL EQUIPMENT:		
-- liquid fertilizer tanks		
-- granular insecticide and herbicide hopper		
-- disk furrows		
-- spring tooth incorporators		
-- row leveller chains		
-- tine-tooth row tillage		
-- heavy duty coulters		
-- fluted coulters		
-- heavy duty disk scrape's		
-- 3 bu seed hoppers		
-- heavy duty closing wheels		
-- heavy duty down pressure springs		
-- conservation tillage attachment		
-- two other monitors		

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

Acre (ac) x 0.405	= Hectare (ha)
Foot (ft) x 0.305	= Metre (m)
Inches (in) x 25.4	= Millimetres (mm)
Horsepower (hp) x 0.746	= Kilowatt (kW)
Miles/Hour (mph) x 1.61	= Kilometre/Hour (km/h)
Pounds Mass (lb) x 0.454	= Kilogram (kg)
Pounds Mass/Cubic Foot (lb/ft ³) x 16.02	= Kilograms/Cubic Metre (kg/m ³)
Pounds Force (lb) x 4.45	= Newton (N)
Pounds Force/Foot (lb/ft) x 14.6	= Newton/Metre (N/m)
Pounds Force-Feet (lb-ft) x 1.36	= Newton-Metre (n-m)
Pounds Force/Square Inch (psi) x 6.89	= Kilopascal (kPa)
Cubic Feet (ft ³) x 28.6	= Litres (L)
Bushel (bu) x 36.4	= Litres (L)
Pounds/Acre (lb/ac) x 1.13	= Kilograms/Hectare (kg/ha)
Seeds/Acre (seeds/ac) x 2.5	= Seeds/Hectare (seeds/ha)

SUMMARY CHART

JOHN DEERE MAX-EMERGE ROW CROP PLANTER

RETAIL PRICE: \$39,199 (March, f.o.b. Portage la Prairie, Manitoba) with front folding tool bar, 8 seed units with finger pickup metering system, granular fertilizer hoppers, seed unit down pressure springs, chain shields and Computer Track 300.

	<u>EVALUATION</u>	<u>COMMENTS</u>
OVERALL PERFORMANCE	Very Good	
QUALITY OF WORK		
Seed Metering	Very Good	medium round corn seed at planting seeds of 5 mph (8 km/h) gave best results.
Fertilizer Application	Good	actual rates were higher than rates stated in operator manual, particularly for low application rates.
Penetration	Excellent	performance of fertilizer disk openers reduced in clay soils.
Soil Finishing	Very Good	consistent coverage.
Monitor	Very Good	unsatisfactory for monitoring seeding rates of white beans and soybeans.
EASE OF OPERATION AND ADJUSTMENT		
Speed and Fertilizer Application Rates	Excellent	central sprocket transmission. storage not required for alternate sprockets.
Filling	Very Good	convenient lid latches and holding straps on hoppers.
Transporting	Excellent	minimal effort to put in transport position.
POWER REQUIREMENTS		90 HP (67 kW) minimum.
OPERATOR SAFETY	Good	weights needed for front end of tractor.
OPERATOR MANUAL	Excellent	well written and clearly illustrated.
MECHANICAL PROBLEMS		short wear-life of fertilizer disk opener scrapers.

CAUTION

This summary chart is not intended to represent all of the final conclusions of the evaluation report. 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.



**ALBERTA
FARM
MACHINERY
RESEARCH
CENTRE**

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>

Prairie Agricultural Machinery Institute

Head Office: P.O. Box 1900, Humboldt, Saskatchewan, Canada S0K 2A0
Telephone: (306) 682-2555

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