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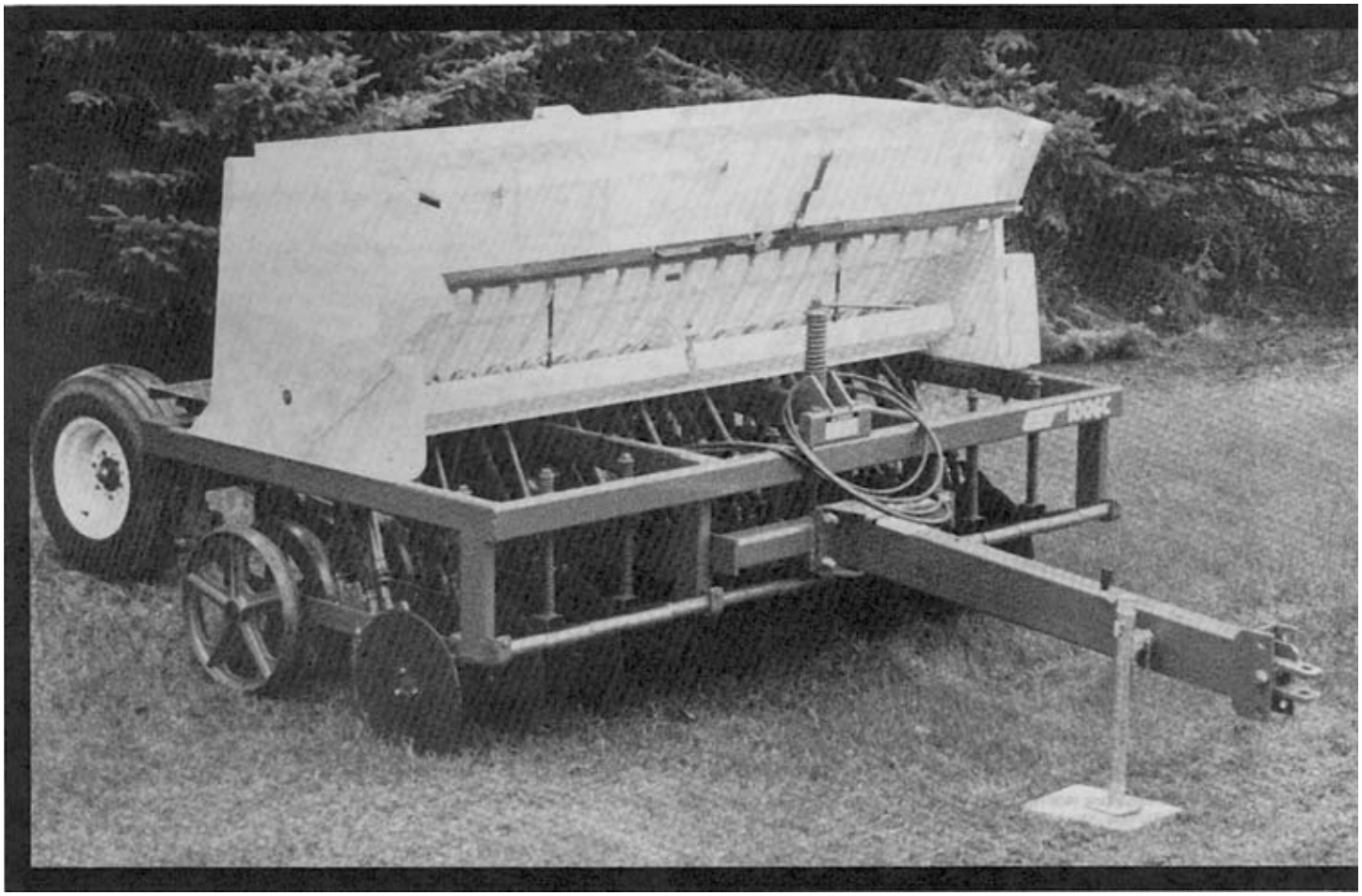
Evaluation Report 518



GT Versa Drill 1006 No-Till Grain Drill

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

GT VERSA DRILL 1006 NO-TILL GRAIN DRILL

MANUFACTURER AND DISTRIBUTOR:

GT Manufacturing Co. Inc.
P.O. Box 525
Clay Center, Kansas
Toll Free Canada: 1-800-633-4386

RETAIL PRICE:

$21,450.00 (July 1987 f.o.b. Portage la Prairie, Manitoba) 9.9 ft (3.0 m) width, 6.6 in (168 mm) spacing, with combination seed-fertilizer box and grass seed box.

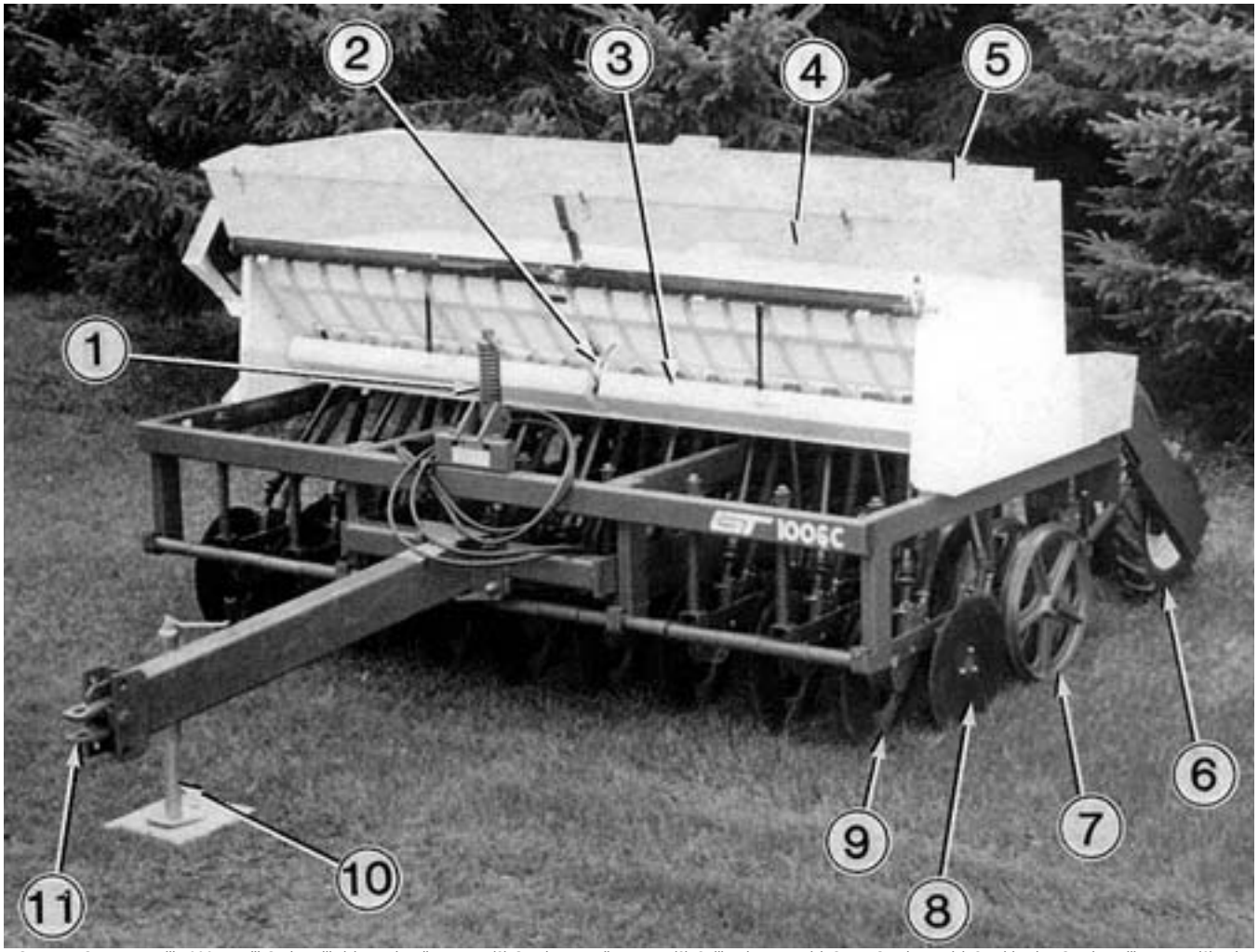


FIGURE 1. GT Versa Drill 1006 No-Till Grain Drill: (1) Depth Adjustment, (2) Seed Rate Adjustment, (3) Calibration Tray, (4) Grass Seed Box, (5) Combination Seed-Fertilizer Box, (6) Drive Wheel, (7) Press Wheel, (8) Disk Furrow Opener, (9) Seed Shoe, (10) Hitch Jack, (11) Hitch.

SUMMARY

Quality of Work: Penetration was excellent when seeding directly into moist stubble fields and very good when seeding into dry stubble fields and pastureland. The ability of the single disk opener to pass through surface residue was very good in firm soils and good in soft, moist soils. In very heavy trash seed placement was fair. The press wheels provided adequate compaction in most soils encountered.

The accuracy of the seed metering system was good in wheat and rapeseed with a wide range of settings. After considerable adjustment, the variation between runs was acceptable. The seeding rates of most crops were relatively unaffected by field roughness or level of grain in the grain box. The seeding rate of wheat increased as much as 7.1% when travelling down a 15° slope. Increasing field speed from 3 to 7 mph (5 to 11 km/h) decreased the seeding rate of wheat as much as 8.8%.

The accuracy of the fertilizer metering device was good.

Variation in application rates between runs was insignificant.

Application rates were not affected by field roughness, or level of fertilizer in the fertilizer box. The application rate decreased by as much as 8.6% when travelling down a 15° slope. Increasing the field speed from 3 to 7 mph (5 to 11 km/h) decreased the fertilizer application rate as much as 30%.

A grass seeding attachment was made available as optional equipment on the GT. The accuracy of the metering device was very good for small seeds such as alfalfa and good for large light seeds such as rye grass.

Ease of Operation: Wet field conditions caused a buildup of mud between the press wheels and often plugged the entire drill. Small rocks occasionally wedged between adjacent press wheels. Filling the seed and fertilizer boxes was convenient especially if a drill fill was used. The boxes were easy to clean and the lids did not leak moisture. The drill was very easy to transport behind a tractor but had a large hitch weight for a light truck.

Ease of Adjustment: One grease fitting on the depth screw adjustment required occasional lubrication. The depth adjustment was fast and simple but had no calibrated scale for reference. Both the seed and fertilizer rates were easy to change.

Power Requirements: A 100 hp (75 kW) tractor should have sufficient power reserve to operate one section of the 9.9 ft (3.0 m) drill in all field conditions and speeds.

Operator Safety: The GT 1006 was safe to operate if normal safety precautions were observed. The fertilizer adjustment lever could trip an unalert operator.

Operator's Manual: The operator's manual was good. It contained useful information on a number of topics.

Mechanical History: A number of parts were damaged in severe stony conditions. Also the hitch pin, which connected the transport hydraulic cylinder to the drill showed considerable wear after 49 hours of use.

RECOMMENDATIONS:

It is recommended that the manufacturer consider:

1. Modifications to the seed metering system to ensure more uniform seeding from the individual seed cups.
2. Including appropriate seed rate charts with the grass seeding attachment, in both imperial and metric units of measure.
3. Modifications to the drill to reduce plugging with mud in wet field conditions.
4. Modifications to the drill so that an acremeter could be installed.
5. Including metric calibration charts as well as seed and fertilizer densities used in calibrating the drill.
6. Relocating the fertilizer adjustment lever to reduce the chances of injury to the operator.
7. Modifications to the transport system to reduce wear on the hydraulic cylinder hitch pins.

Station Manager: G.M. Omichinski

Project Engineer: D.J. May

THE MANUFACTURER STATES THAT

With regard to the recommendation:

1. In future production, flow dividers will be added between the individual seed cups inside the hopper. This wilt help to more closely regulate the seed that is available to each cup.
2. The seed rate chart has been updated and in future drill production will be presented in both Imperial and SI units.
3. Correct adjustment of the mud scrapers is essential for proper operation of the drill in adverse field conditions. As with any drill or planter, favorable field conditions must be present before attempting to plant.
4. Provisions are currently being made for the mounting of an acre meter on the 10 ft combination Drill and will be available in future production.
5. The charts shall be updated to include the densities of the seed and fertilizer used in calibration. The information will be presented in both systems of measure.
6. The fertilizer handle currently in production is manufactured in such a way that it follows the contour of the hopper and protrudes only far enough from the hopper to allow the operator to place his/her hand on the lever. This is approximately 1.5 to 2 in.
7. The strength of the pin has already been increased and is now case hardened. A hardened sleeve has also been added to the clevis of the hydraulic cylinder.

MANUFACTURER'S ADDITIONAL COMMENTS:

When initially setting up the drill, it is important to follow the calibration procedures as outlined in the Operator's Manual. This will help to assure uniform seed distribution from row to row.

Acre meters are currently available on alt 8, 10 and 14 ft drills except the 10 ft Combination Drill.

In addition to the hardened pin and clevis sleeve, the 8 and 14 ft drill series also have hardened sleeves in the mounting brackets, which are welded to the drill frame.

GENERAL DESCRIPTION

The GT 1006 (FIGURE 1) is a 9.9 ft (3.0 m) grain drill designed for no-till seeding. It is equipped with 18 single disk openers with side mounted seed shoes spaced 6.6 in (168 mm) apart in two ranks. Seeding depth is controlled by transferring weight from the press wheels to the disk openers and is adjusted with a simple screw adjustment. The grain box has a capacity of 16.8 bu (0.59 m^3) and the fertilizer box has a capacity of 1060 lb (480 kg). A gate can be repositioned and both boxes filled with grain to give a capacity of 30.2 bu (1.06 m^3).

Seed and fertilizer are metered by externally ridged traction wheels through infinitely adjustable sliding gates. Telescoping plastic tubes deliver the seed to the openers while flexible rubber hoses deliver the fertilizer. A grass seed attachment was installed as optional equipment. The 21 in (530 mm) diameter press wheels pack the soil directly behind the openers. The drill was also equipped with scrapers on the press wheels.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The GT 1006 was operated under field conditions as shown in TABLE 1 for 59 hours while seeding 320 ac (129 ha). It was evaluated for quality of work, ease of operation and adjustment, power requirements, operator safety and suitability of the operator's manual.

During the test small to large stones were encountered in 155 ac (63 ha). The drill was transported over 250 mi (420 km) on paved roads and 50 mi (80 km) on gravel roads.

TABLE 1. Operating Conditions

Field Condition	Operating Hours	Equivalent Field Area	
		ac	ha
Soil Type:			
-sand	2	10	4
-sandy loam	3	19	7
-clay loam	54	291	116
Total	59	320	129
Crop:			
-canola	15	80	32
-flax	11	60	24
-barley	7	40	16
-barley & grass seed	7	35	14
-grass seed	19	105	43
Total	59	320	129
Land:			
-stubble	3	14	6
-stubble mulch	35	191	77
-conventional	9	50	20
-pasture	12	65	26
Total	59	320	129

RESULTS AND DISCUSSION

QUALITY OF WORK

Penetration: The drilling of seeds directly into stubble or pastureland in a no-till planting operation requires an opener that will cut through heavy surface trash, penetrate dry compacted soils and produce a minimum amount of soil disturbance. Excessive soil disturbance promotes weed growth and loss of soil moisture.

The GT 1006 was equipped with single disk furrow openers with side mounted seed shoe (FIGURE 2). Penetration of the openers was excellent when seeding directly into moist stubble fields and very good when seeding into dry stubble fields. There was no provision for the addition of ballast, and it was not found to be necessary for conditions in which the drill was tested.

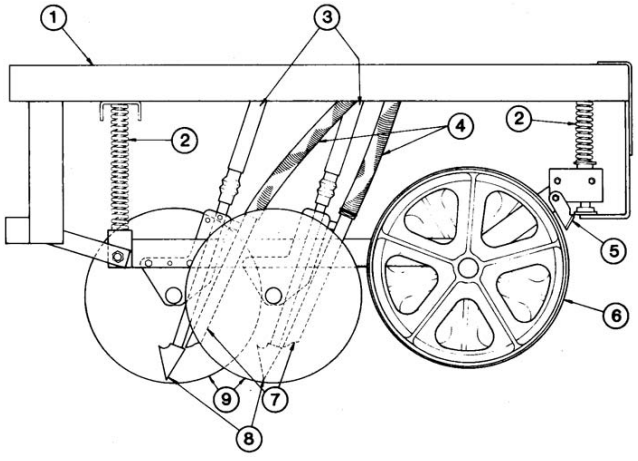


FIGURE 2. Single Disk Opener: (1) Drill Frame, (2) Pressure Spring, (3) Seed Tubes, (4) Fertilizer Hoses, (5) Mud Scraper, (6) Press Wheel, (7) Fertilizer Spouts, (8) Seed Shoes, (9) Disk Furrow Openers.

The ability of the single disk opener to pass through surface residue was very good in firm soils and good in soft, moist soils. Some straw was pushed into the furrow bottom without being cut when operating in soft, moist soils (FIGURE 3). Extremely heavy surface residue prevented proper opener penetration regardless of soil conditions. Straw and chaff should be spread evenly before seeding.

One hydraulic cylinder controlled the transport wheels, which

in turn raised and lowered the entire machine. Individual depth adjustment of the openers travelling in the tractor wheel tracks was not possible. Pressure adjustment on the individual openers was also not possible.

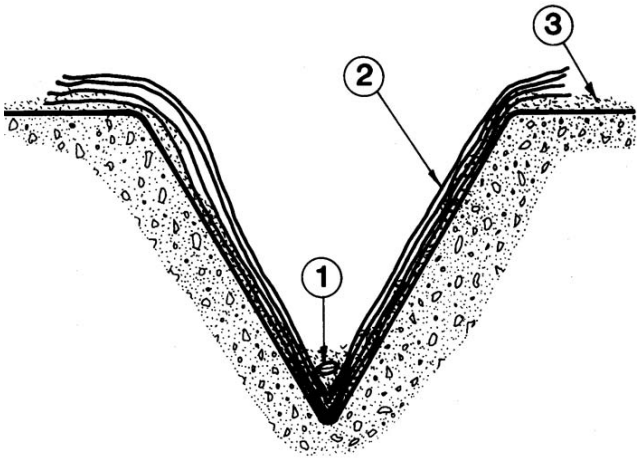


FIGURE 3. Schematic Representation of Hairpinning in Soft Moist Conditions: (1) Seed, (2) Uncut Straw, (3) Chaff.

The downward force on each opener could increase from 0 to 500 lb (2220 N) as the springs compressed. The maximum average force with grain and fertilizer boxes empty was 290 lb (1280 N) per opener.

Seed Placement: The basic rules for the conventional seeding of cereal and oilseed crops also apply to the direct drilling of these crops into stubble. The seed is ideally placed when it is in moist soil on a firm seedbed with the soil packed tightly about the seed for optimum moisture contact and minimum soil drying. Generally, small oil seeds and winter wheat should be seeded 0.8 to 1.5 in (20 to 40 mm) from the soil surface. Cereals should be seeded 1.5 to 2.5 in (40 to 65 mm) from the soil surface.

In very heavy trash, seed placement was fair. Failure of the openers to cut through the surface residue resulted in seed being placed either in the residue or on the soil surface. In soft soil conditions the trash was pushed to the bottom of the furrow without being cut. The seed was then placed on the trash and covered with a small amount of trash and soil. This reduced the contact between the seed and the soil that is necessary for good germination. Seed placement was good in fields with evenly spread surface residue.

Seeding depth was fairly uniform with slight variations resulting from field or seedbed irregularities. Measurements of seeding depth when seeding wheat at 5 mph (8 km/h) in stubble showed that at least 68% of the seeds were within 0.51 in (13 mm) of the average seeding depth[1]. Higher speeds caused more seed scatter.

Seed coverage was good but negatively affected with an increase in speed. Seed coverage was reduced in hard packed ground and in trashy conditions. Seed and fertilizer were placed close together in the furrow.

The GT 1006 could be used for seeding conventionally into a prepared seedbed without requiring major machine modifications. The test unit performed very well in the stubble mulch fields encountered.

Soil/Stubble Disturbance: Minimizing soil disturbance is important under dry conditions in that it lessens moisture loss and reduces germination of some annual weeds. The width of the seed shoe on the GT 1006 was about 1.5 in (38 mm). This width was small enough to keep soil disturbance minimal in most field conditions (FIGURE 4).

Retaining stubble is also important since it helps trap snow to insulate winter wheat, to provide moisture in the spring, and to reduce soil erosion. The small width of the seed shoe minimized the amount of stubble knockdown in most field conditions, and resulted in very good snow catch. The GT 1006 single disk opener left about 60% of the stubble standing.

Soil Compaction: The narrow cast iron press-wheels followed directly behind each opener, in one rank, effectively pressing the soil about the seeds. The press wheels provided good compaction in most soils encountered.

FIGURE 4. Soil Disturbance and Stubble Knockdown with the GT 1006.

In very hard packed soil, the seed would sometimes be left with little or no covering soil to be packed around it.

The maximum average packing force exerted by each wheel with the boxes empty was about 290 lb (1280 N) per wheel.

Plant Emergence: In general, the crops seeded directly into stubble or conventionally into a prepared seedbed, germinated well and emerged evenly if adequate moisture was present (FIGURE 5). In dry fields, complete emergence occurred only after rain. Seed emergence in heavy trash ranged from fair to good as the trash prevented proper opener penetration.

FIGURE 5. Emergence of Barley Drilled Directly into Stubble with Average Moisture Conditions, 55 Days After Seeding.

Metering Accuracy: The grain and fertilizer metering systems (FIGURE 6) were calibrated in the laboratory and compared with the manufacturer's calibration. Differences between the manufacturer's calibration charts and actual seeding rates may be due to a number of factors such as seed size, density and moisture content. Since seed densities were not stated in the operator's manual for calibration charts provided, actual rates should be checked by the operator. Small variations in seed or fertilizer application rates will not significantly affect grain crop yields.

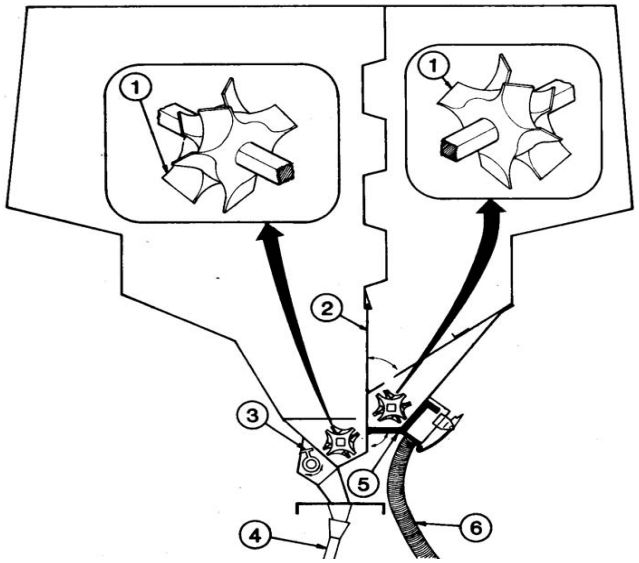


FIGURE 6. Grain and Fertilizer Metering Systems: (1) Externally Ridged Wheels, (2) Movable Gate, (3) Seed Shut-Off, (4) Seed Tube, (5) Clean-Out Gate, (6) Fertilizer Hose.

[1]*Seeding depth was determined by measuring the seedling root length to the ground surface. Ungerminated seeds either on the surface or below the soil surface were not considered.*

In general, the accuracy of the GT 1006 was good for the wheat used in PAMI calibrations. Sample wheat density was 62.5 lb/bu (808 kg/m³). A calibration chart for rapeseed was not provided by the manufacturer.

Field roughness and level of seed in the grain box did not significantly affect the seeding rate. Variation in field speed and variation in field slope had a significant effect on the seeding rate. As shown in FIGURE 7, travelling down a 15° slope increased the seeding rate of wheat as much as 7.1%. When increasing the field speed from 3 to 7 mph (5 to 11 km/h) the seeding rate of wheat decreased as much as 8.8%.

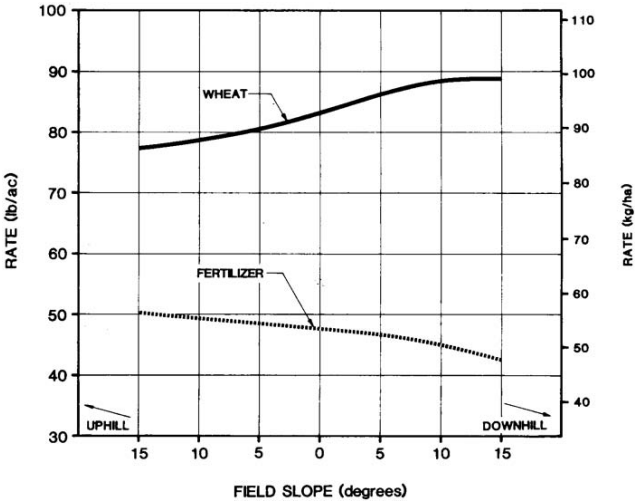


FIGURE 7. Variation in Seed and Fertilizer Application Rate with Change in Slope While Seeding Wheat and 11-51-00 Fertilizer.

The coefficient of variation (CV) can also be used to describe the variation of application rates among individual seed cups. If the CV is less than 15%, seeding is acceptable whereas if the CV is much greater than 15%, the variation among individual seed or fertilizer cups is excessive. When seeding rapeseed at 10.1 lb/ac (11.3 kg/ha) the CV on the first attempt was 22.4% indicating variation was excessive. After adjusting the individual seed cups and checking the variation several times, the CV eventually came down to 13.8% indicating acceptable uniformity. It is recommended that the manufacturer consider modifications to the seed metering system to ensure more uniform seeding from the individual seed cups.

Sometimes after stopping the drill at the end of a seed row, the seed would continue to run out of the seed shoe and onto the ground. It would continue to run out until all of the individual runs were closed by turning the nylon shut-offs or by moving the calibration pointer handle to the top of the graduation scale and locking it in position. This problem usually occurred when seeding small round seed such as rapeseed or very smooth seed such as flax.

Fertilizer Metering System: FIGURE 8 shows PAMI calibration results in comparison with the manufacturer's calibrations. The small difference between the two calibrations is probably due to the difference in density of fertilizer.

The variation in fertilizing rates from one run to another was very small. When distributing 11-51-00 fertilizer at a rate of 47.4 lb/ac (52.8 kg/ha), the CV among individual fertilizer cups was 7.7%indicating very uniform metering.

The fertilizer application rate was not significantly affected by the level of fertilizer in the box, or field vibrations. Variations in field speed and variation in field slope did have an effect on the fertilizing rate. As shown in FIGURE 7, travelling down a 15° slope decreased the fertilizing rate by as much as 8.6%. When increasing field speed from 3 to 7 mph (5 to 11 km/h) the fertilizer application rate decreased as much as 30%.

Grass Seeding Attachment: A grass seeding attachment was installed as optional equipment on the GT 1006. The accuracy of the metering device was very good for small light seeds such as alfalfa and good for large, light seeds such as ryegrass. Large, light seeds usually metered without bridging, with little or no field vibration.

The seed rate charts included with the grass seeding attachment were for a hydraulic drive, electric drive or mechanical drive instead of a ground drive as the one installed on this unit. For this reason the PAMI calibration results were far different than the manufacturer's calibrations. It is recommended that the manufacturer consider including appropriate seed rate charts with the grass seeding attachment, in both Imperial and metric units of measure. TABLE 2 shows PAMI calibrations for ryegrass and alfalfa.

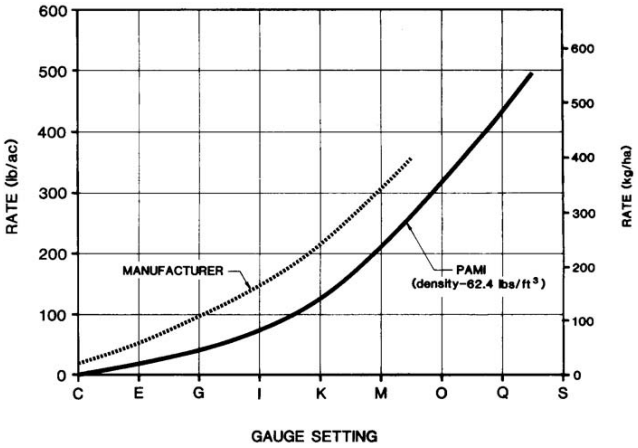


FIGURE 8. PAMI Calibration Compared to Manufacturer's Calibration While Applying Fertilizer.

TABLE 2. Ryegrass and Alfalfa Calibrations with Grass Seeding Attachment (PAMI)

Meter Setting	Ryegrass		Alfalfa	
	lb/ac	kg/ha	lb/ac	kg/ha
5	—	—	0.23	0.26
10	0.04	0.05	3.3	3.7
15	0.12	0.13	9.8	11
20	0.26	0.29	19	21
25	0.49	0.55	33	37
30	0.89	1.0	48	54
35	1.5	1.7	69	77
40	2.1	2.4		
45	3.3	3.7		
50	4.7	5.3		
55	6.5	7.3		
60	8.9	10		

EASE OF OPERATION

Wet Fields: In wet field conditions the disk openers and seed shoes would turn up mud which would usually stick between the press wheels and eventually plug the entire drill. The press wheels were equipped with mud scrapers. However, they only removed mud from the circumference of the wheel and not the interior or between wheels. Plugging occurred often in most wet soils encountered. It is recommended that the manufacturer consider modifications to the drill to reduce plugging with mud in wet field conditions.

Stony Field: Small rocks occasionally wedged between adjacent press wheels in stony fields. A metal bar was usually required to remove the rocks.

Compressing the pressure spring permitted the openers and press wheels to lift a maximum of 4 in (100 mm) to clear rocks and other obstructions. The opener force increased to 740 lb (3290 N) as both springs compressed to the maximum. Average opener force during normal operation varied from 150 to 300 lb (670 to 1330 N).

Trashy Fields: Heavy surface residue reduced opener penetration and soil seed contact. Lifting the seed shoe to give the disk a better chance to cut the straw partially solved this problem. Surface residue should be spread evenly before attempting to seed through it.

Filling: The GT 1006 had adequate openings in the seed and fertilizer boxes for easy filling. The tops of the boxes were 5.7 ft (1.73 m) above the ground. This was low enough for easy filling with most drill fills. The rear platform was large and access to it was very good.

The seed box had a capacity of 16.8 bu (0.59 m³) and the fertilizer box had a capacity of 1060 lb (480 kg) of fertilizer with a density of 62.4 lb/ft³ (1000 kg/m³). A hinged section of wall between the tanks could be easily moved to give a seed box capacity of 30.2 bu (1.06 m³). The drill was equipped with sight windows on the seed box to check the level of seed. There were no feedshaft speed indicators.

Moisture: The seed and fertilizer box lids were well sealed

against heavy rains. The fertilizer box leaked a small amount of moisture around the bottom drop panel in heavy driving rains. If fertilizer is left in the box in humid weather the feedshaft should be checked before operating to ensure that it is free to rotate and that the fertilizer has not caked. Seed and fertilizer cups should also be checked periodically to ensure they have not plugged.

Cleaning: The grain box could easily be cleaned with a vacuum cleaner. The fertilizer box was cleaned by dropping the bottom panel and dumping out the unused fertilizer.

Acremeter: An acremeter was not available to fit on the GT 1006 with grass seed box and combination seed-fertilizer box. It is recommended that the manufacturer consider modifications to the drill so that an acremeter could be installed.

Transportability: The drill trailed well and rode smoothly behind a tractor or medium sized truck at speeds up to 19 mph (30 km/h) providing grain and fertilizer boxes were empty. It is not recommended that a light truck be used to pull the drill due to the large hitch weight. The overall width of the machine was 9.9 ft (3.0 m), which permitted easy travel down most roadways.

There was ample ground clearance of 8 in (200 mm) to prevent the openers from dragging on roads (FIGURE 9). Lock pins were provided to keep the drill in the raised position when the wheels were in transport position.

FIGURE 9. Ground Clearance During Transport.

Marker: The test machine was not equipped with a marker system. The mark from the previous pass could be easily seen so a marker was not necessary.

EASE OF ADJUSTMENT

Lubrication: The GT 1006 had one grease fitting which required occasional lubrication. This grease fitting was located on the depth adjustment screw, which required grease to keep it turning smoothly and easily. The drive chains and gears required oiling regularly.

Seeding and Fertilizer Rates: The seeding rate was easily changed by turning a simple screw adjustment. The screw was turned until the pointer reached the scale position indicated in the rate charts. Then the rate was checked and the calibration screw fine tuned to achieve the desired rate. A hand crank for turning the feedshaft, and catch trays were supplied by the manufacturer for ease of calibration.

The fertilizer rate was adjusted by slackening off the shut-off lever, positioning the cam gauge at the position indicated in the calibration chart and moving the shut-off lever up tight against the cam gauge. The rate should then be checked and the cam gauge repositioned if necessary. This was a simple and fast procedure.

Depth: The entire drill was raised and lowered with one hydraulic cylinder from the tractor seat. The depth was set by turning a simple screw adjustment. This transferred the weight from the rear of the drill onto the disk openers for planting deeper, and transferred the weight from the openers to the rear of the drill for planting shallower.

POWER REQUIREMENTS

Maximum draft at 1.6 in (40 mm) depth with average soil moisture was about 3400 lb (15 kN) while average draft was about 2400 lb (11 kN). A 100 hp (75 kW) tractor should be adequate in all fields and field speeds.

OPERATOR SAFETY

The GT 1006 was safe to operate if normal safety precautions were observed. Pinch points and moving parts were adequately shielded. The drill had warning decals and a slow moving vehicle sign. The fertilizer adjustment lever stuck out over the operator platform and could trip or injure an unalert operator. It is recommended that the manufacturer consider relocating the fertilizer adjustment lever to reduce the chances of injury to the operator.

OPERATOR'S MANUAL

The operator's manual contained useful information on assembly, operation, adjustments, calibration, safety and optional equipment. It lacked metric calibration charts for grain and fertilizer rates, as well as densities of grain and fertilizer used in the calibrations. It is recommended that the manufacturer consider including metric calibration charts as well as seed and fertilizer densities used in calibrating the drill.

MECHANICAL HISTORY

A number of components were damaged while operating the drill in severe, stony conditions. Nearly all the seed shoes were bent to some degree. One fertilizer spout and spout holder was bent and one disk mounting bracket was broken. Two disks were also badly notched and were replaced. All damaged parts were replaced with new parts provided by the manufacturer.

The hitch pin, which connected the transport hydraulic cylinder to the drill, showed considerable wear after 49 hours of use. If the pin had broken completely while the drill was raised, substantial damage could have occurred. It is recommended that the manufacturer consider modifications to the transport system to reduce wear on the hydraulic cylinder hitch pins.

APPENDIX I
SPECIFICATIONS:

MAKE:	Gilmour-Tatge Inc.
MODEL:	1006 No-Till Grain Drill
SERIAL NUMBER:	84069
DIMENSIONS:	
-- height	
-transport	6.8 ft (2.07 m)
-field	5.7 ft (1.73 m)
-- length	
-transport	14.9 ft (4.54 m)
-field	15.3 ft (4.65 m)
-- width	9.9 ft (302 m)
-- effective seeding width	9.9 ft (3.02 m)
-- transport ground clearance (openers)	8.0 in (200 mm)
SEED METERING SYSTEMS:	
-- type	externally ridged traction wheels
-- drive	gear and chain driven off rear drive wheel
-- adjustment	turn calibration screw to open or close slide gate opening
-- transfer to openers	telescoping plastic tubes
FERTILIZER METERING SYSTEMS:	
-- type	externally ridged traction wheels
-- drive	gear and chain driven off rear drive wheel
-- adjustment	move calibration lever to open or close slide gate opening
-- transfer to openers	convoluted rubber hose
OPENERS:	
-- type	single disk with side mounted seed shoes
-- width of seed shoe	1.5 in (38 mm)
-- diameter of disk opener	18 in (460 mm)
-- number of openers	18
-- number of ranks	2
-- distance between ranks	9.5 in (240 mm)
PRESS WHEELS:	
-- type	cast, ribbed wheel
-- diameter	21 in (530 mm)
-- width	3 in (75 mm)
-- number	18
-- spacing	6.6 in (170 mm)
-- number of ranks	1
TIRES:	
-- number	3
-- tire size	
-transport wheels	2, 9.5 L x 15
-drive wheel	1, 6 x 12 2-ply
GRAIN AND FERTILIZER BOX CAPACITIES:	
-- grain box	16.8 bu (0.60 m^3)
-- number of grain boxes	1 per unit
-- fertilizer capacity	1060 lb (480 kg)
-- number of fertilizer boxes	1 per unit

WEIGHT: Without Ballast	**Boxes Empty**	**Boxes Full**
-- on transport wheels	3294 lb (1494 kg)	4615 lb (2093 kg)
-- on hitch	1874 lb (850 kg)	2621 lb (1189 kg)
Total	5168 lb (2344 kg)	7236 lb (3282 kg)

NUMBER OF CHAIN DRIVES: 4

NUMBER OF LUBRICATION POINTS: 1

NUMBER OF HYDRAULIC CYLINDERS: 1

NUMBER OF SEALED BEARINGS: 82

APPENDIX II
MACHINE RATINGS

The following rating scale is used in PAMI Evaluation Reports:

Excellent	Fair
Very Good	Poor
Good	Unsatisfactory

SUMMARY CHART

GT 1006 VERSA DRILL NO-TILL GRAIN DRILL

RETAIL PRICE:	$21,450 (July 1987, F.O.B. Portage la Prairie, Manitoba)
QUALITY OF WORK:	
Penetration	**Excellent;** moist stubble fields **Very Good;** dry stubble fields and pastureland
Trash Cutting	**Very Good**
Accuracy of Seed Metering Device	**Good;** wheat and rapeseed Distribution among individual seed cups hard to set initially
Fertilizer Metering Device	**Good;** 11-51-00 Field slope and speed had significant effect on seed and fertilizer rates.
EASE OF OPERATION:	
Wet Field Conditions	Plugged press wheels often in wet conditions
Filling	**Good;** box openings adequate
Transportability	**Very Good;** ample ground clearance
EASE OF ADJUSTMENT:	
Seed and Fertilizer Rates	Very easy to change
Depth	Fast and simple; no calibrated scale
POWER REQUIREMENTS:	100 hp (75 kW) tractor has sufficient reserve for all field conditions and speeds.
OPERATOR SAFETY:	Safe, if normal precautions observed
OPERATOR'S MANUAL:	**Good;** useful information on a number of topics.
MECHANICAL HISTORY:	Number of damaged parts in severe rocky conditions.

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