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Evaluation Report 36

Inland Model FT 56 Field Sprayer

A Co-operative Program Between

ALBERTA FARM MACHINERY RESEARCH CENTRE

PAMI
PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

Inland Model FT 56 Field Sprayer

Manufacturer:
Inland Steel and Forgings Ltd.,
675 Washington Avenue
Winnipeg, Manitoba
R2K 1M4

Distributors:
Can-Am Farm Supply Ltd., Crawfords of Alberta Ltd., Federated Co-operatives Ltd., MacLeods Ltd., Midtown Farm Equipment Ltd., Robinson Alamo Distributors Ltd., Robinson Machinery Ltd., United Farmers of Alberta Ltd.

Retail Price:
$1,150.00 (April, 1977, f.o.b. Winnipeg, less trailer tires and tubes)

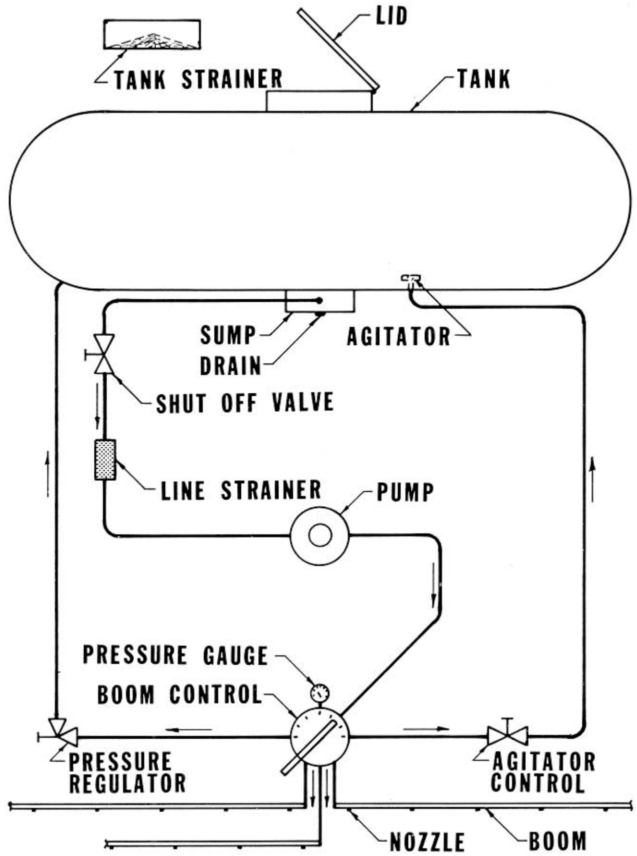

Figure 1. Flow Diagram for Inland FT 56.

Summary and Conclusions

Functional performance of the Inland Model FT 56 sprayer was good. An extended durability test was not conducted. Durability of the FT 56 during functional evaluation was g ood.

The Inland FT 56 performed satisfactorily at speeds up to 11 km/h (7 mph) resulting in a field capacity of 19 ha/h (48 ac/h). The boom castor wheels performed satisfactorily in the field,

Nozzle distribution patterns were unacceptable at pressures below 280 kPa (41 psi) with the low volume 650 brass nozzles supplied as standard equipment. Distribution patterns improved at higher pressures but resulted in excessive spray drift. Very uniform nozzle distribution patterns were possible ff the sprayer had been equipped with 80° nozzles,

Pump capacity was adequate to agitate and apply most commonly used chemicals. Pressure losses through the plumbing system were minimal. Filtering was adequate, however, the 50 mesh nozzle strainers were too coarse permitting particles to pass and plug the nozzle tips.

Controls could not be reached from most tractor seats. Boom height and angle adjustment were very inconvenient. Folding into transport, hitching to a tractor and servicing were convenient. Lubrication points were accessible. Transport maneuverability was adequate. Although the operator's manual contained some basic instructions it contained no information on calibration and servicing.

Several minor mechanical problems occurred during the test: the hitch ball bolt was too short and loosened, while the hitch coupler was weak and deformed. Both boom support braces broke and the castor wheel end caps wore out.

Recommendations

It is recommended that the manufacturer consider:

1. Supplying 80° nozzle tips as standard equipment.
2. Supplying finer (100 mesh) nozzle strainers for use with smaller capacity nozzle tips.
3. Supplying a finer (100 mesh) screen at the tank filler opening.
4. Relocating the controls so that they can be reached from the tractor seat.
5. Supplying a slow moving vehicle sign.
6. Providing calibration and servicing instructions in the operator's manual.
7. Modifications so the hitch ball can be attached securely to all tractor drawbars.
8. Modifications to prevent ball joint coupler failure.
9. Modifications to prevent boom support brace failure.
10. Modifications for trouble-free castor wheel service.
11. Modifications to prevent hose holder failure on the top of the tank.
12. Supplying a metric or dual calibrated pressure gauge or suitable conversion charts to facilitate sprayer operation after conversion to the SI system.

Chief Engineer: E.O. Nyborg

Senior Engineer: E.H. Wiens

Project Engineer: K.W. Drever

The Manufacturer States That:

With regard to recommendation number:

1. 80° nozzle tips are being supplied as standard equipment on 1977 sprayers.
2. 100 mesh nozzle strainers are being supplied with 1977 sprayers.
3. We will investigate the possibilities of using a 100 mesh screen in the tank strainer.
4. The control stand will be modified so that controls can be more easily reached from the tractor seat.
5. A bracket will be provided to which a slow moving vehicle sign can be attached.
6. Additional calibration and servicing information will be included in our instruction sheets.
7. The hitch ball bolt will be lengthened.
8. The ball joint coupler will be strengthened.
9. The boom support brace has been modified and strengthened for 1977 sprayers.
10. Modifications which have been made to 1977 sprayers are expected to overcome problems of wear on castor wheels.
11. The hose holder at the top of tank will be fabricated from heavier material.
12. The availability of a dual calibrated pressure gauge will be discussed with the gauge supplier.

General Description

The Inland Model FT 56 is a trailing, boom type sprayer. The trailer is mounted on a single axle and each boom is supported by a castor wheel. The low profile 1 137 L (250 gal) galvanized steel tank is equipped with hydraulic agitation and a fluid level indicator. The FT 56 has 34 nozzles spaced at 502 mm (19.75 in) resulting in a spraying width of 17,068 mm (56 ft). End nozzles are provided for spraying roadsides, ditches and fencelines. Boom height and spray angle can be adjusted. The booms fold back for transport. The 540 rpm nylon roller pump is driven from the tractor power take-off. Pressure and boom controls are mounted on a pedestal at the front of the trailer.

Figure 1 shows the flow diagram for the FT 56 while complete specifications are contained in Appendix I.

Scope of Test

The Inland FT 56 was operated for 53 hours in the conditions shown in Table 1 while spraying about 860 ha. (2 120 ac). It was evaluated for quality of work, distribution patterns, nozzle wear, pump capacity, ease of operation, operator safety and suitability of the operator's manual.

Table 1. Operating Conditions

Chemical Applied	Hours	Speed km/h	(mph)	Spraying Rate ha/h	(ac/h)	Field Area ha	(ac)
2, 4-D	18	10	(6.0)	16	(40)	292	(720)
Banvel-3	17	10	(6.0)	16	(40)	276	(680)
Water	18	10	(6.0)	16	(40)	292	(720)
TOTAL	53					860	(2120)

Results and Discussion

QUALITY OF WORK

Distribution Patterns: Figures 2 and 3 show the spray distribution pattern along the length of the boom when equipped with the 65° TeeJet 6501 nozzles supplied with the sprayer and operated at 140 and 310 kPa (20 and 45 psi) respectively. The coefficient of variation* at 140 kPa (20 psi) was 37% with application rate along the boom varying from 22 to 75 L/ha (2.0 to 6.7 gal/ac) at a forward speed of 8 km/h (5 mph). High concentrations of spray were delivered directly below each nozzle, with inadequate covereage between nozzles due to insufficient overlap. Operation at 310 kPa (45 psi) resulted in

* The coefficient of variation (CV) is a measure of distribution pattern uniformity. The lower the CV, the more uniform is the spray coverage. Some researchers claim that a CV below 10% indicates very uniform coverage while a CV above 15% indicates inadequate uniformity of coverage for chemicals having a narrow range of application rates. The CV's shown in this report were determined in stationary laboratory trials. Field trials have shown that the CV in actual field conditions may be up to 10% higher than that obtained in stationary tests due to boom vibration and wind effects. Manufacturer recommendations for different chemicals vary as to the acceptable range of application rates. For example, 2,4-D solutions have a fairly wide range of acceptable rates (±14%) while chemicals such as Buctril M have a very narrow acceptable range.

improved distribution and spray overlap. The CV in this case was 12% with application rates varying from 48 to 76 L/ha (4.3 to 6.8 gal/ac). Higher pressures improved the distribution pattern but resulted in more spray drift.

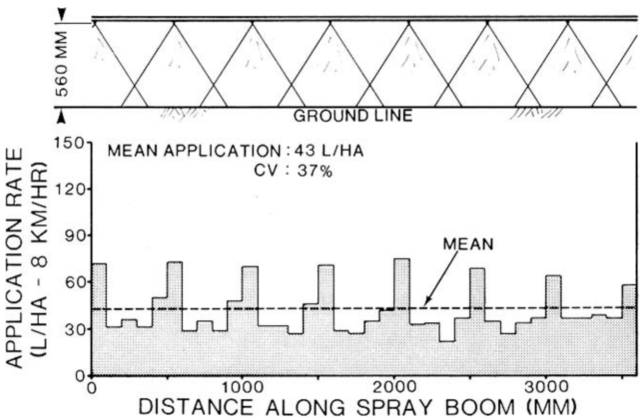

Figure 2. Distribution Pattern for a Section of Spray Boom at 140 kPa (20 psi) with Tee Jet 6501 (65°) Nozzle, 560 mm (22 in) above Ground.

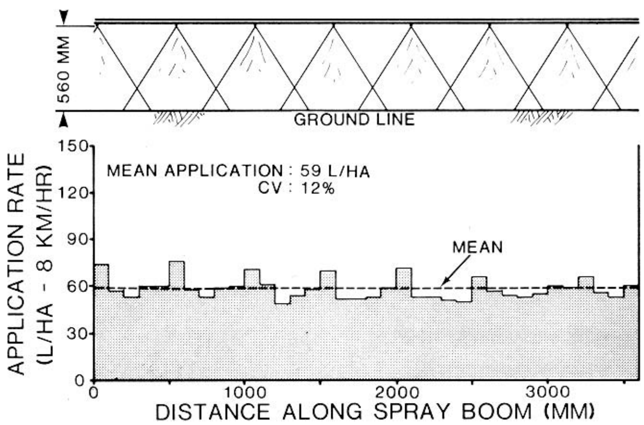

Figure 3. Distribution Pattern of a Section of Spray Boom at 310 kPa (45 psi) with TeeJet 6501 (65°) Nozzles, 560 mm (22 in) above ground.

Figure 4 compares spray pattern uniformity at various boom pressures for the 65° TeeJet 6501 nozzles supplied with the sprayer and for nozzles of the same capacity but with a spray angle of 80° (TeeJet 8001). Spray distribution was unacceptable at pressures below 280 kPa (41 psi) for the 65° nozzles. Spray distribution was acceptable above 250 kPa (41 psi) but it was not possible to obtain very uniform distribution (CV less than 10%) in the acceptable operating range below 310 kPa (45 psi).

When equipped with 80° nozzles, spray distribution was acceptable at pressures from 165 to 195 kPa (24 to 28 psi) and was very uniform at pressures above 195 kPa (28 psi). It is evident that 80° nozzles would greatly improve nozzle distribution and allow spraying at lower pressures to reduce drift.

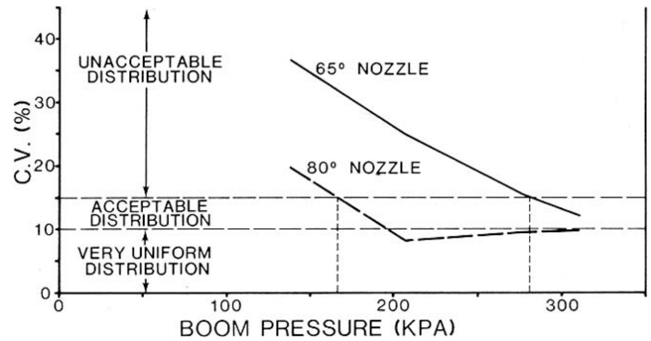

Figure 4. Spray Pattern Quality at Various Boom Pressures, with 65° and 80° Nozzles.

Spray Drift: To obtain an acceptable spray distribution with the supplied nozzles, the FT 56 had to operated at pressures above 280 kPa (41 psi) or above 165 kPa (24 psi) when using 80° nozzles. Work by the Saskatchewan Research Council* indicates that drift at the edge of a spray pattern would be about 3% of the sprayer output when spraying 56 L/ha (5 gal/ac) at 170 kPa (25 psi). Increasing the pressure to 275 kPa (40 psi) nearly doubles the drift. Using 80° nozzles would result in less drift since lower pressure is required to obtain suitable distribution. In addition, 80° nozzles are operated at a lower boom height. It is recommended that the manufacturer supply 80° nozzles as standard equipment to reduce spray drift and to improve spray distribution.

Nozzle Calibration and Wear: Figure 5 compares the delivery rates of the brass 65° nozzles when new and after 53 hours of operation.

Delivery from new nozzles was the same as the manufacturer's rated capacity. Nozzle wear during the field operation caused the output-of the nozzles to increase by 11%. Some researchers indicate that a nozzle needs replacement once delivery has increased by more than 10%. The excessive increase in capacity was attributed to wear caused by abrasive material in some of the water that was used for spraying.

Figure 5 also shows the variability among individual nozzles. The shaded areas represent the range over which the deliveries from 10 nozzles varied when new and after field tests. A narrow range indicates that nozzle discharges are very similar while a wider range indicates more variability among individual nozzle deliveries. Variability among individual nozzle deliveries on the FT 56 was low. The coefficient of variation of the nozzle deliveries was 4.7% when new and decreased to 3.4% after the field tests.

* Maybank, J., Yoshida, K., "Droplet Deposition and Drift from Herbicide Sprays - Analysis of the 1973 Ground-Rig Trials", Saskatchewan Research Council Report No. P73-16, December, 1973, p. 65.

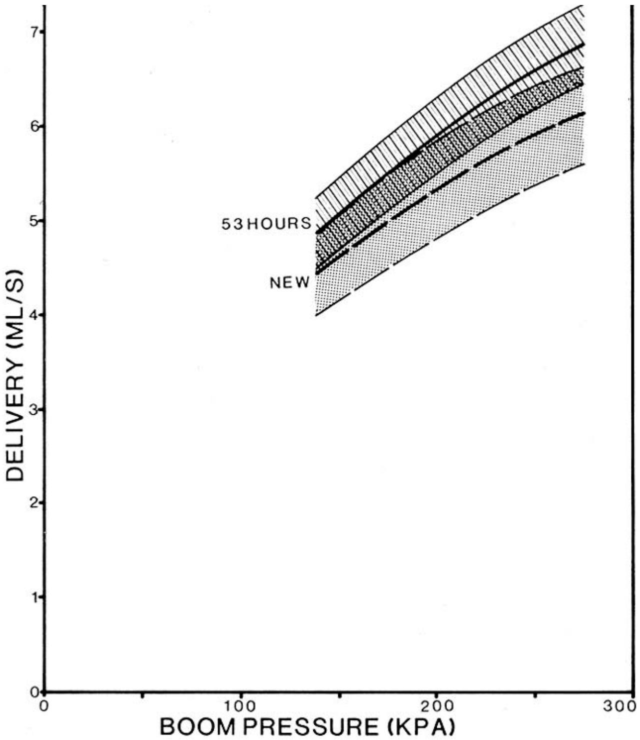

Figure 5. Delivery Rates of TeeJet 6501 Nozzles - New and Used 53 Hours.

Use of End Nozzles: Figure 6 shows a typical distribution pattern at the end of the boom when using end nozzles. The end nozzle distribution was unacceptable due to improper overlap between the end nozzle and the nozzles on the spray boom. Application varied from 3 to 174 L/ha (0.3 to 15.5 gal/ac). The use of the end nozzles resulted in increased drift because the spray was directed out from the boom where wind had a greater effect. End nozzles should be restricted to use along fencelines, and roadsides on calm days.

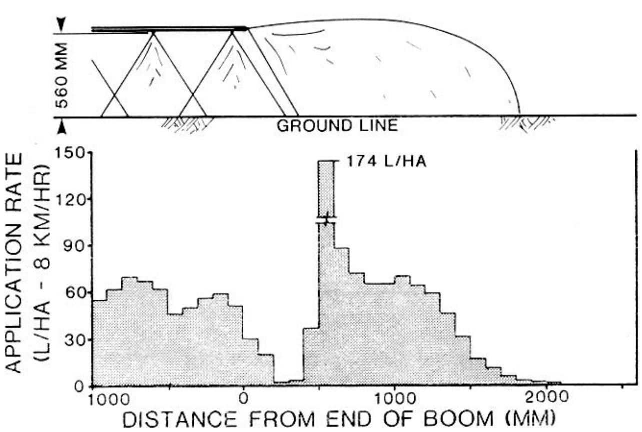

Figure 6. Distribution Pattern at the Boom End at 275 kPa (60 psi) using End Nozzles, 560 mm (22 in) above Ground.

Use of Optional Nozzles: The FT 56 sprayer was equipped with standard TeeJet nozzle body assemblies (Figure 7) so a wide range of nozzle tips could be used on the sprayer. Flat fan, flooding or cone type nozzles could be used since boom height and nozzle angle were adjustable.

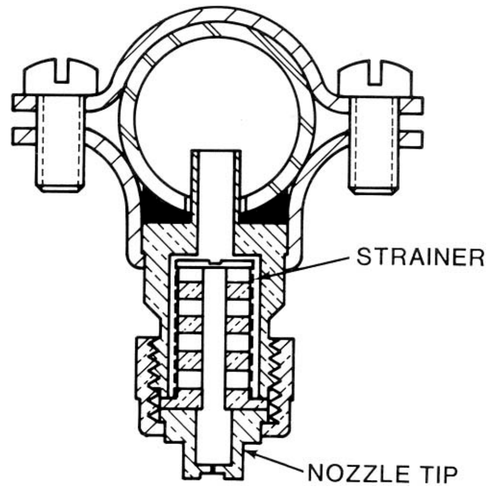

Figure 7. Cross Section of Nozzle.

Booms: The FT 56 was driven over a series of standard obstacles to determine boom stability. The obstacles were semi-circular in cross section with lifts of 40, 65 and 105 mm (1.6, 2.6 and 4.1 in). The boom castor wheels were driven over the obstacles at speeds of 6, 9 and 12 km/h (3.7, 5.6 and 7.5 mph). Both the horizontal boom movement in the direction of travel and the vertical boom movement were measured at the boom end and midway between the castor wheels and trailer.

Figure 8 shows vertical boom movement (bounce) when the castor wheel was driven over the obstacles at 9 km/h (5.6 mph). The maximum movement at the end of the boom was a lift of 200 mm (7.9 in) and a drop of 100 mm (3.9 in). This resulted in a variation in boom height above the ground from 460 mm (18.1 in) to 760 mm (29.9 in), compared to the correct boom height of 560 mm (22 in). Figure 9 compares the nozzle overlap at these three boom heights.

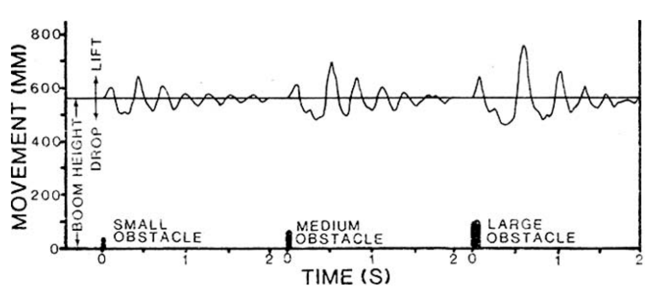

Figure 8. Vertical boom Movement at Boom End (lift and drop) when the Boom Castor Wheel is Driven over Different Obstacles at a Forward Speed of 9 km/h (5.6 mph).

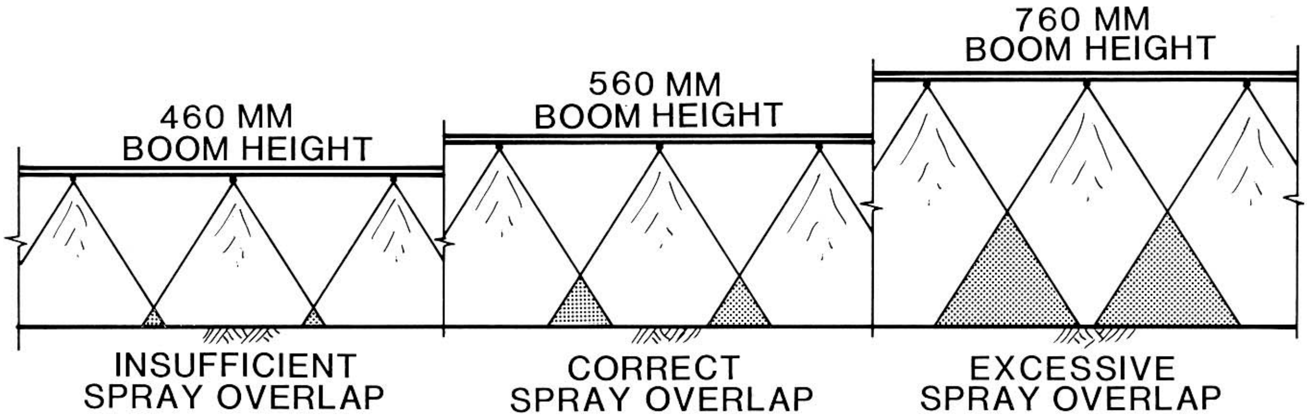

Figure 9. The Effect of Boom Lift and Drop on Spray Overlap.

The lift and drop at the centre of the boom was slightly less than that at the boom end. Operations at 6 km/h (3.7 mph) or 12 km/h (7.5 mph) over the obstacles caused vertical boom movements about the same as those at 9 km/h (5.6 mph).

Driving over an obstacle with the boom wheels also caused the forward speed of the boom to vary in relation to the tractor speed since the boom initially deflects rearward and then springs forward. Figure 10 shows the forward speed of the boom end, relative to the ground when the boom wheel was driven over the standard obstacles. Boom forward speed is important since the application rate is inversely proportional to speed (doubling the forward speed cuts the application rate in half). Assuming that the nozzle spray follows boom movement, the traces of speed in Figure 10 illustrate the resultant variation in application rates. High application rates occur at low speeds and low application rates occur at high speeds. Extremely high variations in application rate can result for short periods of time due to horizontal boom movement. For example, at a forward speed of 9 km/h (5.6 mph) driving over the 65 mm (2.6 in) obstacle caused boom speed to vary from 1 to 15 km/h (0.6 to 9.3 mph). Respective application rates would vary from 468 to 30 L/ha (41.7 to 2.7 gal/ac). This variation occurred in only 0.2 second during which time the sprayer travelled 500 mm (20 in). Speed changes due to horizontal vibration were very similar on the FT 56 at all operating speeds.

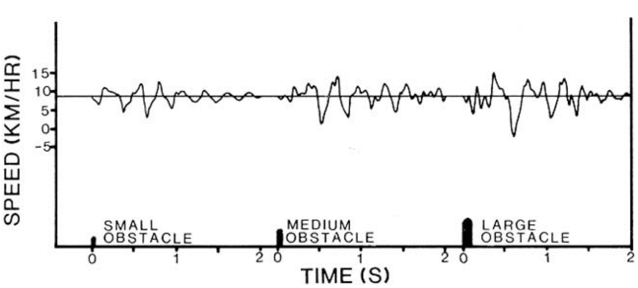

Figure 10. Variation in Boom End Speed when the Boom Castor Wheel is Driven over Different Obstacles at an Average Forward Speed of 9 km/h (5.6 mph).

The data presented in Figure 10 are based on the assumption that the nozzle spray output follows boom movement over very short periods of time (0.2 second). The extreme variations in application that are suggest, ed due to boom movement indicate that more research is required on boom stability and its effect on nozzle discharge and spray distribution.

Measurements of boom stability and field observations indicated that the boom end braces (Figure 11) appreciably reduced boom movement at the boom end. The booms operated satisfactorily on rolling terrain and across gullies.

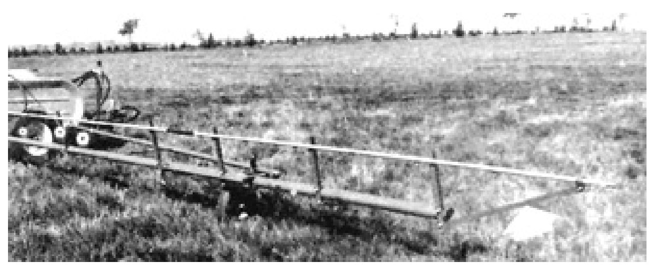

Figure 11. Boom End Braces.

Castor Wheels: The castor wheels performed well in normal field operation.

Pressure Losses in Plumbing System: Pressures in the plumbing system were measured at the pump outlet, boom control, boom inlet and boom end. The pressure drop through the system was negligible, indicating that hose and fitting sizes were adequate.

Pressure Gauge: The pressure gauge read 7 kPa (1 psi) low throughout the test. This was considered negligible.

The pressure gauge was calibrated only in psi. Due to the present change over to the SI (metric) system, a pressure gauge calibrated in both psi and kPa, or suitable conversion tables, should be supplied with the sprayer.

Tank Strainer: The 50 mesh basket strainer located at the tank filler opening was effective in removing foreign material before it entered the tank. A finer (100 mesh) strainer would remove finer particles that could damage the pump.

Line Strainer: The line strainer bowl could be easily removed for cleaning without tools. The 50 mesh strainer prevented serious damage to the pump.

Nozzle Strainers: The 50 mesh nozzle strainers did not prevent nozzle plugging. Finer 100 mesh strainers are required for use with TeeJet 6501 nozzle tips.

Soil Compaction and Crop Damage: The trailer and boom wheels travelled over about 2.2% of the total field area sprayed. The wheel tread of the trailer was 1630 mm (5.3 ft) and matched the wheel tread on most tractors used for spraying. The only crop damage, in addition to that caused by the tractor wheels, was that caused by the boom castor wheels. This was only 0.7% of the total area sprayed. The soil contact pressure beneath the castor wheels was about 50% that of an unloaded pickup truck. The average soil contact pressures under the sprayer wheels, with a full tank are given in Table 2.

Table 2. Soil Compaction by Sprayer Wheels

	Average Soil Contact Pressure* with Tank Full		Tire Track Width	
	kPa	(psi)	mm	(in)
Trailer Wheels	276	(40)	130	(5.1)
Castor Wheels	117	(17)	56	(2.2)

* For comparative purposes an unloaded pickup truck has an approximate soil pressure of 207 kPa (30 psi).

Agitation Capability: The pump, when new, had a total delivery of 0.78 L/s (10.3 gal/min) at 276 kPa (40 psi) and 540 rpm (Figure 12). This was adequate to apply 130 L/ha (11.6 gal/ac) of emulsifiable concentrates or 56 L/ha (5 gal/ac) of wettable powders at 8 km/h (5 mph) and provide sufficient agitation to keep the solution in the tank properly mixed. Normally recommended agitation rates for emulsifiable concentrates such as 2,4-D are 0.03 lis per 100 L of tank capacity (1.5 gal/min per 100 gal of tank capacity). For wettable powders such as Atrazine and Sevin recommended agitation rates are 0.05 L/s per 100 L of tank capacity (3.0 gal/min per 100 gal of tank capacity).

If a 20% pump wear allowance is assumed, a worn pump could apply and agitate 95 L/ha (8.5 gal/ac) of emulsifiable concentrates or 21 L/ha (1.9 gal/ac) of wettable powders. The pump was adequate for most chemicals when new, but was inadequate for wettable powders, when worn.

Operation at Reduced Speed: Figure 12 shows that reducing pump speed from 540 rpm to 400 rpm resulted in a 30% decrease in pump output. Reduction in pump speed could occur when reducing tractor speed to turn a corner or when operating at reduced engine speed to obtain a correct ground speed to suit nozzle calibration.

Pump Wear: Pump capacity decreased by 37% after 53 hours of field operation. The excessive reduction in capacity was attributed to wear caused by abrasive material in some of the water used for spraying.

The pump was disassembled and inspected for wear. The pump rollers were worn, but very little wear on the pump case was evident. After new rollers were installed, pump delivery was 16% lower than when it was new (Figure 12).

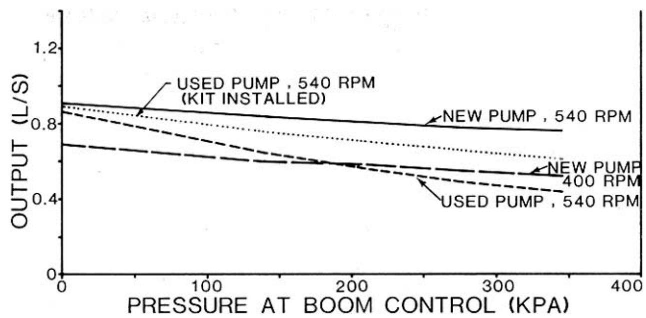

Figure 12. Pump Curves.

EASE OF OPERATION

Controls: Application rate was controlled by adjusting pressure and forward ground speed. Pressure was controlled by adjusting the pressure regulator, the agitator control valve or a combination of the two.

The pressure gauge was visible, however, controls were impossible to reach from the seat of most tractors (Figure 13). The pressure and boom controls should be relocated so that they can be reached from the tractor seat.


Figure 13. Awkward Location of Controls.

Chemical flow to the booms was conveniently controlled with the selector lever (Figure 14). The tank liquid level indicator was easily read if the solution in the tank was opaque. With clear solutions such as Banvel, the level was difficult to read. The gauge was only a rough indicator of liquid remaining in the tank since operation on hills and movement of liquid in the tank caused the level in the tube to fluctuate.

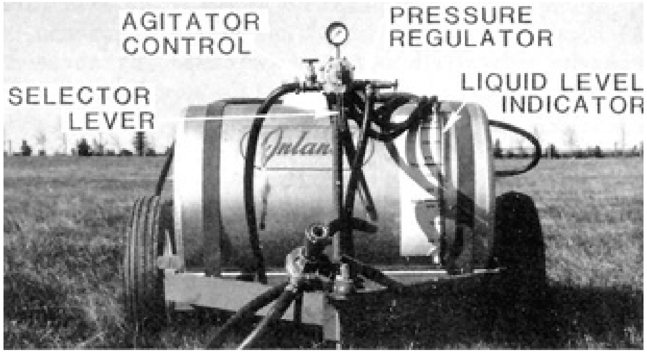

Figure 14. Controls.

Transport: The Inland FT 56 could be folded into transport or unfolded to field position by one man in seven minutes. The hair pin cotters which held the radius brace and transport pins were difficult to remove by hand and a pair of pliers was required. A wrench was needed to tighten the set screws on the radius braces.

The FT 56 had a turning radius in transport of 9130 mm (30 ft). This provided reasonable maneuverability. Backing the sprayer in transport position was awkward. The sprayer towed well at speeds up to 40 km/h (25 mph).

Tank Filling: The low profile tank was easily filled by gravity from a nurse tank on a farm truck. The 395 mm (15.5 in) opening was adequate for adding chemicals and water.

Boom Adjustment: Boom height was inconvenient to adjust. Removal and replacement of 14 boom U-bolts was required to adjust nozzle height (Figure 15). This was time consuming, even when specialized tools such as a deep socket and spinner were used. Nozzle angle adjustment required the loosening of the boom U-bolts and rotating the boom to the desired angle.

When directing the nozzles to spray ahead at 45°, the arm upright had to be rotated back on the boom support arm to prevent spray interference with the boom support arm. This caused interference with the center and outside booms when folding into transport. The arm upright had to be rotated up for transporting. This was inconvenient since 14 arm U-bolts (Figure 15) had to be loosened and tightened to rotate the arm upright.

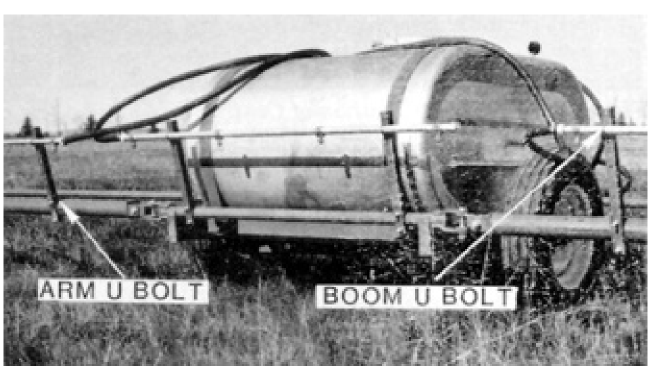

Figure 15. Boom Adjustments.

Nozzle Cleaning: The nozzles were conveniently removed with a wrench for cleaning.

Hitching: The sprayer could be hitched to a tractor without the use of a jack when the tank was empty. With a full tank, a jack was required. The quick disconnect coupling used to attach the sprayer pump to the power take-off was convenient.

Servicing and Cleaning: The FT 56 was easy to service since all grease fittings were accessible. The tank interior was accessible for cleaning from the tank opening. The tank was drained by removing the plug provided in the bottom of the sump.

OPERATOR SAFETY

Operation: No safety hazards were observed if normal safety precautions were taken.

Slow Moving Vehicle Sign: No slow moving vehicle sign was provided with the sprayer. This item should be standard equipment to comply with safety regulations.

Caution: Operators of all spraying equipment are cautioned to wear suitable eye protection, respirators and clothing to minimize operator contact with chemicals. Although many commonly used agricultural chemicals appear to be relatively harmless to humans, they may be deadly. In addition, little is known about the long term effect of human exposure to many commonly used chemicals. In some cases, the effects may be cumulative, causing harm after continued exposure over a number of years.

OPERATOR'S MANUAL

The operating instructions supplied with the sprayer outlined parts, basic operation, transport procedure and storage procedure. There was no information on calibration or servicing.

Durability Results

Table 3 outlines the mechanical history of the Inland FT 56 sprayer during 53 hours of field operation while spraying about 860 ha (2120 ac). The intent of the test was evaluation of functional performance. The following failures represent only those which occured during the functional testing. An extended durability evaluation was not conducted. Consider each failure separately since some are not as serious as others.

Table 3. Mechanical History

Item	Hours	Hectares	(Acres)
TRAILER ASSEMBLY			
-the hitch ball came loose from the tractor drawbar and was replaced at	4	71	(176)
-the nut on the hitch ball loosened again and was retightened at	14	249	(616)
-the ball joint coupler deformed and was reinforced at	12	214	(528)

Item	Hours	Hectares	(Acres)
BOOM AND CASTOR ASSEMBLY			
-both arm support braces broke and were welded at	20	356	(880)
-the right inside castor end cap was worn and replaced at	27	481	(1188)
PLUMBING ASSEMBLY			
-the hose holder on top of the tank bent at	beginning of test		
-the tank lid gasket was lost at	10	178	(440)

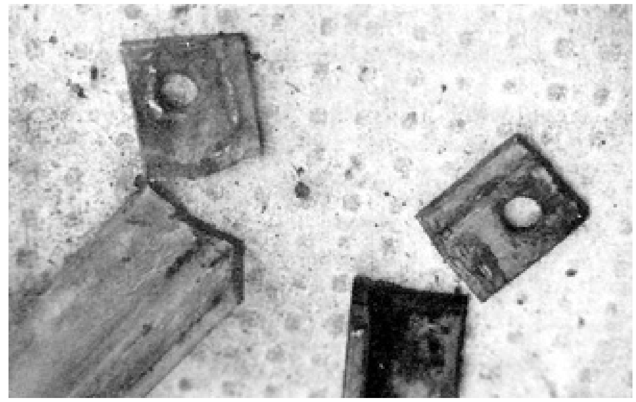

Figure 17. Boom Support Brace Failure.

Discussion of Mechanical Problems

TRAILER ASESMBLY

Hitch Ball: The hitch ball came loose from the tractor drawbar because the bolt connecting it to the drawbar was too short. When the bolt was inserted through the drawbar hole there was not enough thread left to allow the use of a lock washer. A hitch ball with a three inch bolt was used as a replacement. This allowed the use of a lock washer. The ball was then securely fastened to the tractor drawbar.

Ball Joint Coupler: The ball joint coupler deformed at the bolt hole on top of the coupler (Figure 16). A reinforcing plate was welded to the top of the coupler. No further problems occurred.

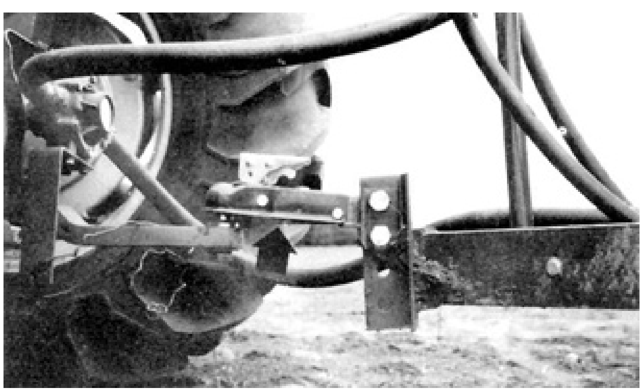

Figure 16. Weak Ball Joint Coupler.

BOOM AND CASTOR ASSEMBLY

Boom Support Braces: The boom end support braces (Figure 11) broke at the ends of the boom arms. Failure occurred at the notched out section of the angle iron brace (Figure 17). The braces were welded and reinforced.

Castor Wheel End Cap: The castor wheel end caps wore due to excessive clearance between the castor wheel hub and castor fork. The hub moved back and forth on the spindle causing the castor end cap to wear and expose the bearing (Figure 18).

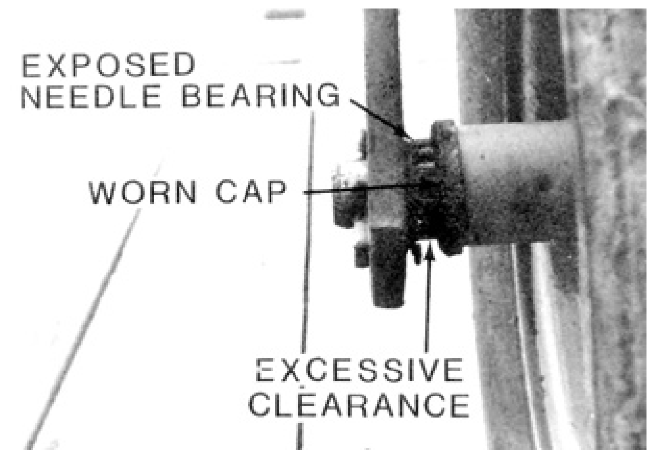

Figure 18. Worn Castor End Cap.

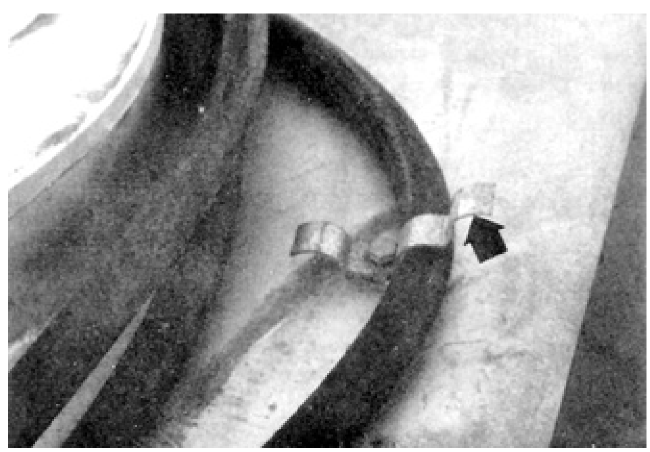

Figure 19. Hose Holder Deformation.

PLUMBING

Hose Holder: The hose holder used to secure the boom hoses to the top of the tank was fabricated from light gauge steel which bent easily (Figure 19). When the hose holder bent, the hoses fell out of the clamp. Modifications are required.

Tank Lid Gasket: There was no provision to fasten the tank lid gasket to the tank filler opening. As a result, the gasket loosened and was eventually lost.

APPENDIX I

SPECIFICATIONS

Model: Inland FT 56
Serial Number: B 13-1

	Field Position	Transport Position
Overall Width:	16,840 mm (55.2 ft)	1890 mm (6.2 ft)
Overall Length:	2645 mm (8.7 ft)	10,200 mm (33.5 ft)
Overall Height:	1260 mm (4.1 ft)	1260 mm (4.1 ft)

	Trailer	Castor
Wheel Tread:	1630 mm (5.3 ft)	10,600 mm (34.8 ft)
Tire Size:	2 - 5.00 x 15 or 14 (rims only)	2 - 4.80/4.00 2 ply rib implement

Weights:	Tank Empty	Tank Full
left trailer wheel	150 kg (330 lb)	685 kg (1510 lb)
right trailer wheel	154 kg (340 lb)	689 kg (1520 lb)
left castor wheel	60 kg (132 lb)	60 kg (132 lb)
right castor wheel	62 kg (136 lb)	62 kg (136 lb)
hitch	23 kg (50 lb)	99 kg (219 lb)
Total	449 kg (988 lb)	1595 kg (3517 lb)

Tank: material - galvanized steel
capacity - 1137 L (250 gal)

Filters: tank strainer - 50 mesh
line strainer - 50 mesh
nozzle strainers - 50 mesh

Pump (540 rpm, pto driven): Hypro C7700 nylon roller

Agitation: hydraulic

Pressure Gauge: Marsh (0 - 100 psi)

Boom: 3/4 inch aluminum pipe

Nozzles (TeeJet 6501 brass): number - 34 + 2 TeeJet 0C 03 brass end nozzles
spacing - 502 mm (19.75 in)

Spraying Width: 17,068 mm (56 ft)

Boom Adjustment: height - maximum 810 mm (32 in)
minimum 0
angle- 360°

Hitch Height Adjustment: maximum 436 mm (17.2 in)
minimum 334 mm (13.2 in)

Lubrication Points:		
	castor pivots	2
	castor bearings	2
	total	4

APPENDIX II

MACHINE RATINGS

The following rating scale is used in PAMI Evaluation Reports:

(a) excellent
(b) very good
(c) good
(d) fair
(e) poor
(f) unsatisfactory

APPENDIX III

METRIC CONVERSIONS

In keeping with the intent of the Canadian metric conversion program this report has been prepared in SI units. For comparative purposes, the following conversions may be used:

1 hectare (ha)	=2.47 acres (ac)
1 litre per hectare (L/ha)	=0.09 Imperial gallon per acre (gal/ac)
1 kilopascal (kPa)	=0.15 pound per square inch (psi)
1 kilometre per hour (km/h)	=0.62 mile per hour (mph)
1 kilowatt (kW)	=1.34 horsepower (hp)
1 litre per second (L/s)	=13.20 Imperial gallons per minute (gal/min)
1 litre (L)	=0.22 Imperial gallon (gal)
1 metre (m)	=1000 millimeters. (mm) 39.37 inches (in)

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