

# Evaluation Report

# 514



**Hooper Seed Brake Boot**

A Co-operative Program Between



# HOOPER SEED BRAKE BOOT

## MANUFACTURER AND DISTRIBUTOR:

Hooper Farms Ltd.  
 P. O. Box 58  
 Waskada, Manitoba, Canada  
 R0M 2E0  
 Ph. (204) 673-2694

## RETAIL PRICE:

\$14.95 (May, 1987, f.o.b. Waskada, Man.).

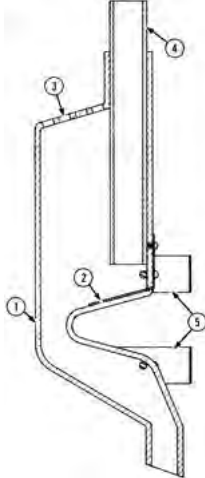


FIGURE 1. (1) Hooper Seed Brake Boot, (2) Wear Plate, (3) Air Vents, (4) Insert Tube, (5) Bolt-On Straps.

## SUMMARY AND CONCLUSIONS

**Quality of Work:** Under field conditions there was less variance in seed depth placement when comparing the Hooper Seed Brake Boot to a conventional seed boot. Plant populations were increased an average of 5% with the use of the seed brake. Seed band width was very distinct for the seed brake compared to a conventional seed boot. The air velocity was reduced at the discharge by 52% when using the Seed Brake. This corresponds to a reduction in material velocity of approximately 25%.

**Ease of Installation:** The installation of the Hooper Seed Brake Boot on a 35 shank cultivator took one man approximately 6 hours.

**Ease of Operation and Adjustment:** The Hooper Seed Brake Boot was trouble free and required no further adjustment providing the boots were properly secured to the shank.

## RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Improving method in which the boot is attached to the cultivator shank.
2. Altering the design of the insert tube to accommodate a wider range of hose diameters.

Project Manager: R. P. Atkins

Project Technologist: Greg Magyar

## THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. A new mounting bracket has been developed for the 1987 model.
2. We will give consideration to changing the insert tube to adapt to different hose sizes.

## GENERAL DESCRIPTION

The Hooper Seed Brake Boot is designed to give better control of seed and/or fertilizer placement when used in place of the conventional seed boot on air seeders.

The polyethylene seed brake is attached to the back of the cultivator shank by two metal straps. The seed brake spout is mounted even with the top plow bolt. The seed brake can be used to place seed in a narrow band or in conjunction with a V-shaped spreader. The distribution hoses from the air seeder are attached to the insert tube at the top of the seed brake.

The seed brake is designed to slow down the seed or fertilizer thus minimizing the amount of seed or fertilizer bounce on the furrow bottom. The seed or fertilizer is slowed down by bouncing the material off of a replaceable bounce plate. A portion of the air is exhausted out the top vents of the seed brake. The material is then funnelled down and out the discharge at a reduced velocity for placement behind the shank.

FIGURE 1 shows the Hooper Seed Brake Boot while dimensions are given in Appendix I.

## SCOPE OF TEST

The Hooper Seed Brake Boot was operated in field conditions shown in TABLE 1 for about 36.0 hours while processing about 144 acres (48.6 ha). The seed brake was mounted on the CI Model 807 heavy duty cultivator in conjunction with the CI Chinook Model 1203 air seeder.

The seed brake was evaluated for quality of work, ease of installation, and ease of operation and adjustment. Measurements were taken and observations were made to determine the effectiveness of the seed brake compared to the conventional seed boot.

TABLE 1. Operating Conditions.

CROP	FIELD TILLAGE CONDITION	FIELD AREA		HOURS
		ac	ha	
Fertilizer banding	Stubble - Secondary	20	8	5
Barley	Summerfallow - Secondary	64	28	16
Winter wheat	Summerfallow - Secondary	36	15	9
Winter wheat	Stubble - Primary	24	10	6
				36
TOTAL		144	59	

## RESULTS AND DISCUSSION

### QUALITY OF WORK

**Seed Placement Accuracy:** The Hooper Seed Brake boot was used during normal seeding with an air seeder. The seed brake was operated beside conventional seed boots to determine its effectiveness. Seed placement accuracy was determined both by observing its performance during normal field operation and by comparing seed depth placement in adjacent strips seeded with a conventional seed boot. Seed depth placement was determined by uprooting seedlings after they emerged and measuring the distance between the seed and the point where the plant emerged through the soil surface. Seed depth measurements were taken across the width of the machine and along the seed rows, for both the seed brake and the conventional seed boot. Average seed placement measurements in soft to firm seedbed conditions showed less variance between the Hooper Seed

Brake Boot and the conventional seed boot. While seeding into primary conditions a definite advantage was observed with the seed brake in that there was less variation in seed depth compared to conventional boots. Seed placement also depends on how rigid the cultivator shank is and type of cultivator. Consequently, it is difficult to isolate differences in seed placement. It was observed that the seed brake would tend to slide up the cultivator shank. This increased the distance between the discharge spout and the seed bed, resulting in poor seed placement. It is recommended that the manufacturer consider improving the method in which the boot is attached to the cultivator shank.

**Plant Populations:** The number of plants per unit area were compared in adjacent strips seeded with a conventional seed boot and the seed brake. The seed brake had an average of 5% more seedlings than the conventional boot. The difference is due to more seeds being placed in ideal germinating conditions, which would indicate a smaller variance in seed depth placement. The difference would be even more apparent in adverse moisture conditions.

**Seed Band Width:** On a 12 in (305 mm) shank spacing, the seed band width when using a spreader (FIGURE 4) averaged 4 in (102 mm) for the seed brake compared to the 6 in (152 mm) width for the conventional boot. The seed band width without a spreader was 2 in (51 mm) for the seed brake compared to 2.8 in (71 mm) for a conventional boot. The seed rows were more distinct with the seed brake than the conventional boot due to a slightly higher plant populations and more concentrated rows. The difference in seed band widths can be attributed to the decrease in air velocity through the seed brake compared to a conventional seed boot. The air velocity through the seed brake was measured to be an average of 52% less than the air velocity through a conventional seed boot. This corresponds to a reduction in material velocity of approximately 25%.

Distinct rows with wide spaces between them (FIGURE 3) may not provide sufficient stubble for windrow support at harvest time. This may require seeding and swathing at angles to each other, or going to a cultivator with a narrower shank spacing.

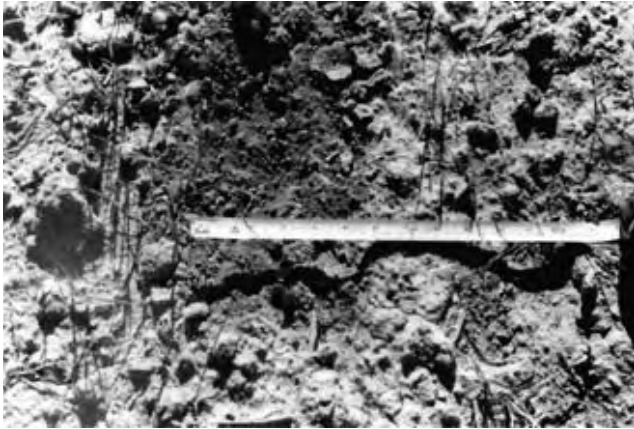


FIGURE 2. Typical Row Spacing.



FIGURE 3. Wheat Emergence on Summerfallow.

### EASE OF INSTALLATION

The Hooper Seed Brake Boot was mounted in place of the conventional seed boot on a heavy duty cultivator. The seed brake was installed on the back of the cultivator shank so that the spout was even with the top plow bolt. A V-shaped deflector can be mounted below the spout (FIGURE 4) to assist in spreading the seed.

The distribution hose from the air seeder was fastened to the insert tube. Although the secondary hose matched the outside diameter of the insert tube, it is recommended that the manufacturer consider altering the design of the insert tube to accommodate a wider range of hose diameters.

Installation of the Hooper Seed Brake Boots on the 35 shank cultivator took one man approximately 6 hours.

### EASE OF OPERATION AND ADJUSTMENT

After the seed brakes were installed they were very easy to operate and only minor adjustments were required. Adjustments included repositioning seed brakes which had shifted on the cultivator shank.



FIGURE 4. Hooper Seed Brake Boot Mounted on Cultivator Shank.

### MECHANICAL HISTORY

The Hooper Seed Brake Boots were operated in the field for about 36 hours. The intent of the test was functional performance and an extended durability evaluation was not conducted. No component showed any appreciable amount of wear during the test period.

APPENDIX I	
<b>SPECIFICATIONS</b>	
<b>MAKE:</b>	Hooper Seed Brake Boot
<b>MANUFACTURER:</b>	Hooper Farms Ltd. P. O. Box 58 Waskada, Manitoba, Canada R0M 2E0 PH. (204) 673-2694
<b>OVERALL LENGTH:</b>	16.375 in (416 mm)
<b>BOOT LENGTH:</b>	14.625 in (372 mm)
<b>DEPTH:</b>	4 in (102 mm)
<b>WIDTH:</b>	1.75 in (44.5 mm)
<b>INSERT TUBE:</b>	1.0 in (25.4 mm)
<b>OUTSIDE DIAMETER:</b>	1.25 in (31.75 mm)
<b>WEIGHT:</b>	1.13 lb (0.51 kg)

# SUMMARY CHART

## HOOPER SEED BRAKE BOOT

<b>RETAIL PRICE:</b>	\$14.95 (May, 1987, f.o.b. Waskada, Man.)
<b>QUALITY OF WORK:</b> -Seed Placement Accuracy -Seed Band Width	<b>Very Good;</b> became poor when boot slid up shank 4 in (102 mm) with a spreader and 2 in (51 mm) without
<b>EASE OF INSTALLATION:</b>	<b>Good</b>
<b>EASE OF OPERATION AND ADJUSTMENT:</b>	<b>Very good</b>
<b>MECHANICAL HISTORY:</b>	<b>Excellent;</b> no problems.



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