
Research Report Summary 688

Spread Pattern of Air Seeder Seed Boots Part II

GENERAL DESCRIPTION

Seed boots on an air seeder are used to place seed and fertilizer in the soil after the soil opener. These seed boots are designed to mount on the back of cultivator shanks.

The seed boots used in the laboratory tests along with their manufacturers are listed below. Detailed specifications and pictures of the seed boots are given in Appendix I.

Seed Boot

Manufacturer

Bourgault seed boots
- Chisel Plow Splitter
- Narrow Square Spread

F.P. Bourgault Industries
Air Seeder Division Ltd.
P.O. Box 39
St. Brieux, Saskatchewan
S0K 3V0
(306) 275-2300

Harmon Pair Row seed boot

Harmon International
2401 Millar Avenue
P.O. Box 1444
Saskatoon, Saskatchewan
S7K 3P7
(306) 931-1161

Morris seed boots
- Three inch Wide Spread
- Five inch Wide Spread

Morris Industries Ltd.
85 York Road
Yorkton, Saskatchewan
S3N 2X2
(306) 783-8585

SCOPE OF TEST

Seed boot operating conditions in the field are extremely variable. Factors such as soil type and conditions, air seeder operation and material type affect the performance of seed boots. A moist soft soil condition was simulated so performance of the various boots could be directly compared. This simulated soil condition limited seed bounce and scatter under the shovel.

The boots were evaluated for band width, dividing uniformity and ease of installation. Test variables consisted of hose position, air velocity and seeding rate. The seed types used were Tobin canola and Leader wheat. The same air delivery system was used for each seed boot.

CONTACT

MANAGER: Rick Atkins, P.Eng. P
PROJECT ENGINEER: Lawrence Papworth, P.Eng.
TECHNICAL AIDE: Blaine Metzger

RESULTS AND DISCUSSION

QUALITY OF WORK

Bandwidth: The seed boots tested either spread the seed into a single or pair row. TABLES 1 and 2 contain data obtained for the single row seed boots and the pair row seed boots. FIGURE 1 describes the bandwidth measurements used for both types of seed boots. The bandwidths obtained are based on limited seed bounce. Soil conditions that permitted seed bounce would result in wider bandwidths than those listed in TABLES 1 and 2.

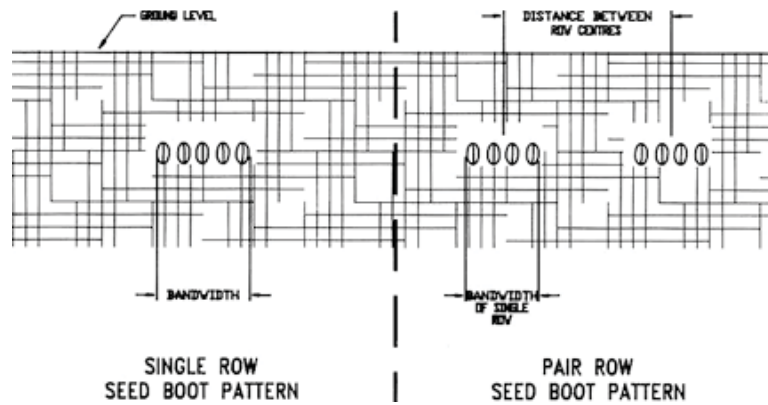


FIGURE 1. Bandwidth Measurements.

Dividing Uniformity: Dividing uniformity of the seed boots was very good for both wheat and canola. Air velocity and seeding rate did not have an effect on the dividing uniformity. Angling the delivery hose to the side in the seed boot inlet affected the dividing uniformity for all of the seed boots except the two Morris seed boots. The Morris seed boots use a 16 in (405 mm) straight hard plastic hose riveted to the boot allowing a straight run of the seed into the boot. Angling the delivery hose on the other seed boots distributed a higher number of seeds to the side of the angled hose. Operators of air seeders should ensure when attaching delivery hoses to air seeder boots that the hoses are straight.

INSTALLATION

Ease of installing the seed boots ranged from poor to very good. Ratings for each seed boot are given in TABLES 1 and 2. One piece seed boots were easier to install than seed boots with two or three pieces. Seed boots secured by one bolt were easier to install than ones that required two bolts. Seed boots that accommodated more than one delivery hose size were easier to install on a wide variety of air distribution systems. The Morris Wide Spread seed boots required divider plates, which were difficult to mount without a pry bar and hammer. None of the manufacturers provided information on installation and operation. Several of the seed boots required mounting bolts of specific length to avoid plugging the boot.

OBERVATIONS

A flat washer was used on the top slotted hole of the Harmon Pair Row seed boot to prevent wheat and canola from escaping.

TABLE 1. Single Row Seed Boot Test Results With No Seed Bounce

SEED BOOT	BANDWIDTH				INSTALLATION
	WHEAT		CANOLA		
	in	mm	in	mm	
Bourgault seed boots - Narrow Square Spread	2.5	63	2.3	58	Very Good

TABLE 2. Pair Row Seed Boot Test Results With No Seed Bounce

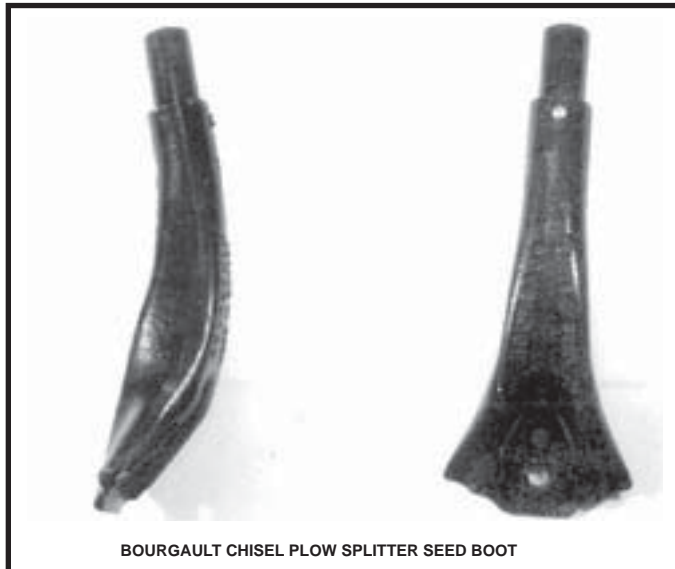
SEED BOOT	BANDWIDTH OF SINGLE ROW				DISTANCE BETWEEN ROW CENTRES				INSTALLATION
	WHEAT		CANOLA		WHEAT		CANOLA		
	in	mm	in	mm	in	mm	in	mm	
Bourgault Chisel Plow Splitter	2.9	74	1.6	41	5.4	137	4.2	107	Very Good
Harmon Pair Row	4.3	108	4.3	108	6.8	173	5.4	137	Good
Morris 3 in Wide Spread Seed Boot & Divider	2.8	70	2.8	70	4.3	108	4.0	101	Poor
Morris 5 in Wide Spread Seed Boot & Divider	2.8	70	2.5	63	5.8	147	5.0	127	Poor

APPENDIX I

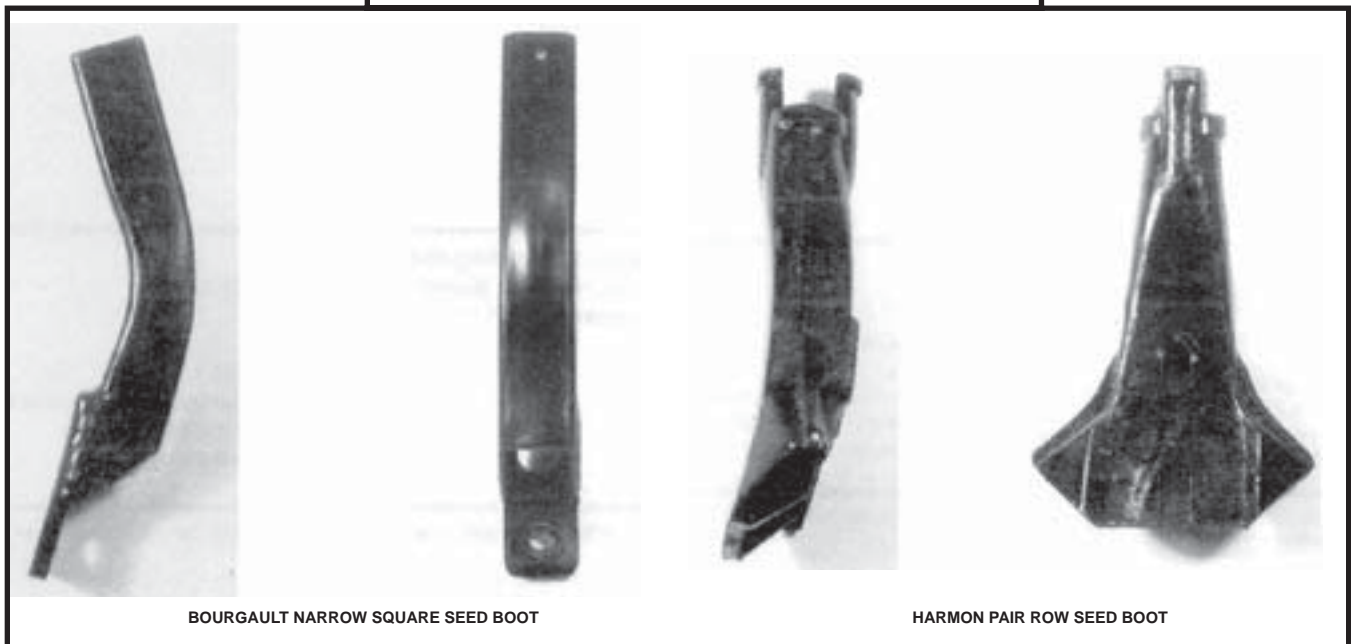
SPECIFICATIONS

MAKE	MODEL	OVERALL DIMENSIONS				INSTALLATION					WEIGHT	
		Width		Length		Type	Bolt Spacing		Delivery Hose Size		lb	kg
		in	mm	in	mm		in	mm	in	mm		
Bourgault	Chisel Plow Splitter seed boot	5.0	127	12.4	315	Single Plow Bolt	1.5-3.5	38-89	1.3 ID	32 ID	4.50	2.10
Bourgault	Narrow Square Spread seed boot	1.5	38	10.8	274	Single Plow Bolt	2.0	51	1.1 OD	28 OD	2.10	0.96
Harmon	Pair Row seed boot	5.6	142	9.0	228	Two Plow Bolts	2.0-3.3	51-82	1.3 OD	32 OD	3.80	1.71
Morris	3 in Wide Spread seed boot	3.1	79	20.8	528	Two Plow Bolts	2.0-2.8	51-70	1.3 ID	32 ID	2.40 0.18	1.09* 0.06**
Morris	3 in Wide Spread seed boot	5.3	133	22.8	577	Two Plow Bolts	2.0-2.8	51-70	1.3 ID	32 ID	2.09 0.44	0.95* 0.20**

*seed boot
**divider

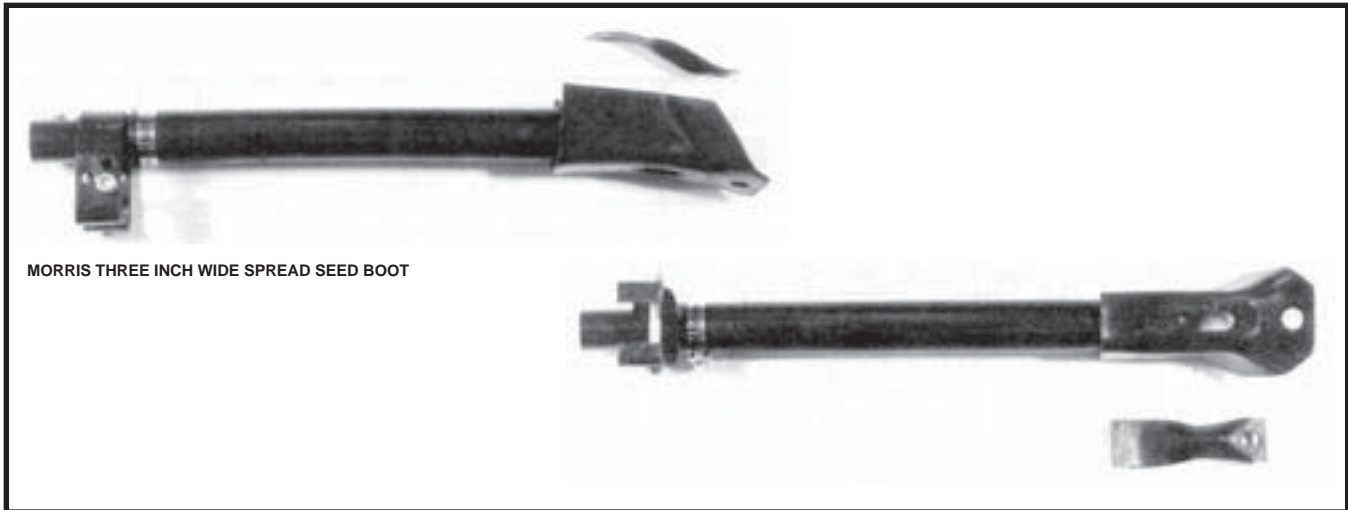


BOURGULT CHISEL PLOW SPLITTER SEED BOOT

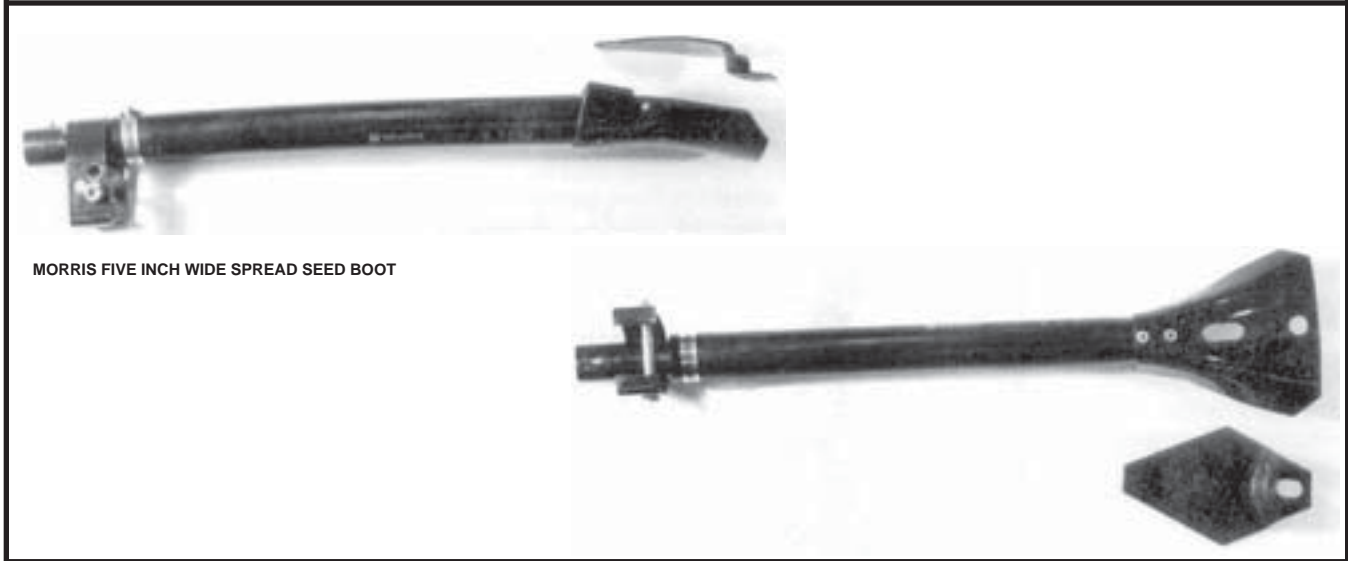


BOURGULT NARROW SQUARE SEED BOOT

HARMON PAIR ROW SEED BOOT



MORRIS THREE INCH WIDE SPREAD SEED BOOT



MORRIS FIVE INCH WIDE SPREAD SEED BOOT



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