



Research Report Summary 679

Spread Pattern of Air Seeder Seed Boots

GENERAL DESCRIPTION

Seed boots on an air seeder are used to place the 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

Bourgault Seed Boots

- Standard
- Widespread One
- Widespread Two

Clarke Seeding Blade

Dutch

- K Seed Boot
- Vern Seed Boot
- Seed Tube

Farmland Agro Seed Boots

- SB2
- SB3

Flexi-coil Seed Boot

Cereal Implements Seed Boot and Flow Divider,
Victory Regular and Edge-on Seed Splitters

Manufacturer

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

Sutherland Steel Foundry
139 105 Street E.
Saskatoon, Saskatchewan
S7N 1Z2
(604) 655-4590

Dutch Industries Ltd.
705-1 Avenue
Regina, Saskatchewan
S4N 4M4
(306) 949-9522

Farm Land Agro Supply Ltd.
4630 61 Street
Red Deer, Alberta
T4N 2R2
(403) 343-6342

Flexi-coil
P.O. Box 1928
Saskatoon, Saskatchewan
S7K 3S5
(306) 934-3500

New Noble Distributors Inc.
215 Barons Street
Nobleford, Alberta
T0L 1S0
1-800-661-8060

SCOPE OF TEST

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. One type of soil condition was simulated so the performance of the various boots could be directly compared. The soil condition simulated was seeding into a moist, soft soil. This soil condition limited any seed bounce or scatter under the shovel.

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

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 the 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.

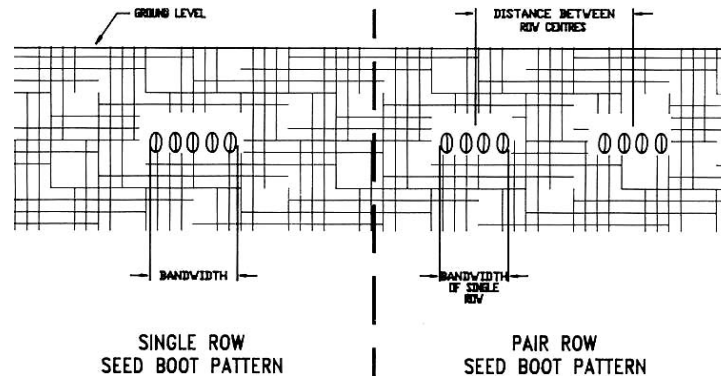


FIGURE 1. Bandwidth Measurements

Dividing Uniformity: Dividing uniformity of all the seed boots was very good for both wheat and canola. Air velocity and seeding rate did not have a significant effect on the dividing uniformity. Angling the delivery hose to the side in the seed boot inlet affected the dividing uniformity for most of the seed boots. Angling the hose 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 as straight as possible.

INSTALLATION

Ease of installing the seed boots ranged from good to very good. Ratings for each seed boot are given in TABLES 1 and 2. One piece seed boots were generally 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. Access to the top fastener was limited to an open end wrench on the Dutch Seed Tube. None of the manufacturers provided information on installation and operation. Several of the seed boots required mounting bolts of specific length.

OBSERVATIONS

One third of the seed was deflected away from the shovel by the deflector on the Cereal Implements Flow Divider. This would cause uneven seed depth in field conditions. A flat washer was used on the top slotted hole of the Dutch K, Flexi-coil and Farmland Agro seed boots to prevent wheat and canola from escaping. A flat washer was also needed but could not be used on the Dutch Vern seed boot to prevent wheat and canola from escaping through the top slotted hole. Three percent of the canola escaped from the vents provided on the Flexi-coil and Farmland Agro seed boots. Wheat did not escape through the vents.

CONTACT

Manager: R. R Atkins
Project Engineer: Lawrence Papworth

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 -Standard -Widespread One -Widespread Two	2.0 3.0 3.5	51 75 89	2.0 2.8 4.0	51 71 102	Very Good
Dutch Seed Tube	1.0	25	1.5	38	Good
Farmland Agro SB3 Seed Boot	5.0	127	5.0	127	Good

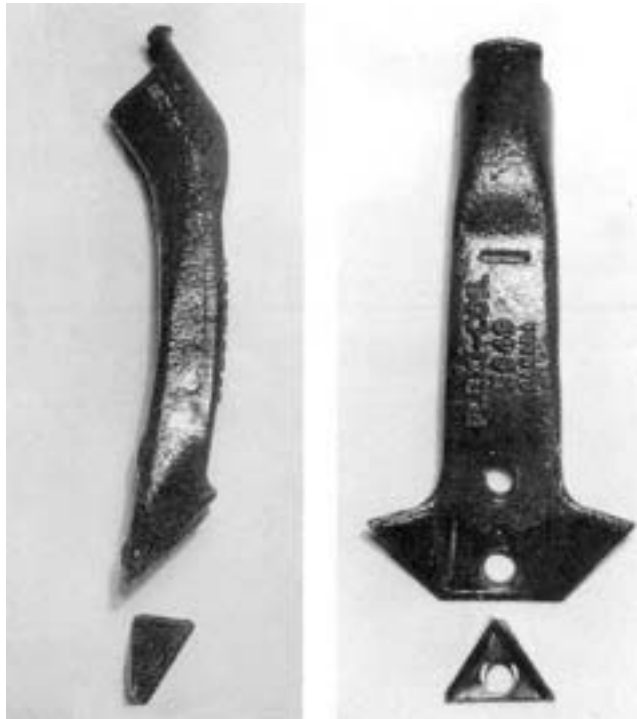
TABLE 2. Pair Row Seed Boot Test Results With No Seed Bounce

SEED BOOT	BANDWIDTH OF SINGLE ROW				DISTANCE BETWEEN ROW CENTRES				INSTALLTION
	WHEAT		CANOLA		WHEAT		CANOLA		
	in	mm	in	mm	in	mm	in	mm	
Cereal Implements Seed Boot and Flow Divider	2.8	71	2.3	58	6.8	173	6.3	160	Good
Clarke Seeding Blade	2.0	51	2.0	51	6.0	152	6.0	152	Good
Dutch K Seed Boot	2.0	51	3.3	84	5.0	127	4.8	122	Good
Dutch Vern Seed Boot	2.0	51	2.5	64	4.0	102	4.8	122	Very Good
Farmland Agro SB2 Seed Boot -wide divider -narrow divider -no divider (single row)	2.0 2.0 4.0	51 51 102	2.0 2.0 4.5	51 51 114	6.0 4.0	152 102	5.0 4.0	127 102	Good
Flexi-coil Seed Boot -divider -no divider (single row)	1.5 3.8	38 97	2.3 3.0	58 76	3.5	89	3.3	84	Good
Victory Seed Splitter -regular -edge-on	1.5 1.4	38 36	2.0 1.4	51 36	6.5 7.4	165 188	7.0 7.4	178 188	Very Good

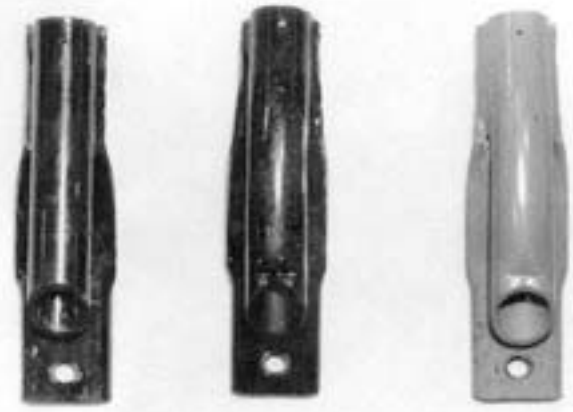
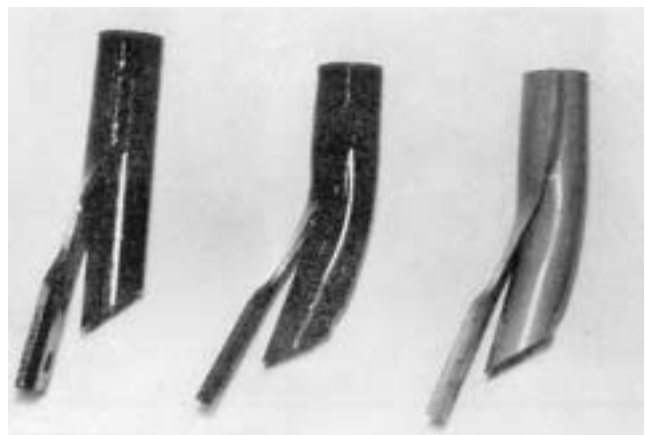
APPENDIX I

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	Three tube Seed Boots	2.5	64	9.5	241	Single Plow Bolt	1.75	44	1.25	32	2.2	1.0	
Ceral Implements	Seed Boot and Flow Divider	1.6	41	14.5	368	Two Plow Bolts	2.4-3.1	60-79	1.25	32	4.6	2.1	
		Seed Boot							ID				Adaptor
		2.3	58						Seed Boot		7.8	3.5	
		Flow Div. Attached							Seed Boot		Seed Boot		
Clarke	Pair Row Seeding Blade	7.0	178	10.8	274	Two Plow Bolts	1.75-3.25	44-83	1.25	32	1.9	0.8	
Dutch	K Seed Boot	5.6	142	11.9	302	Two Plow Bolts	2.0-3.25	51-83	1.25	32	4.3	1.9	
Dutch	Seed Tube	1.5	38	10.4	264	Two Plow Bolts	1.75-3.25	44-83	1.25	32	1.9	0.8	
Dutch	Vern Seed Boot	4.6	117	11.1	282	Two Plow Bolts	2.2-2.75	51-70	1.50	38	6.0	2.7	
Farmland Agro	Seed Boot SB3	3.6	91	8.6	218	Two Plow Bolts	1.75-2.2	44-55	1.25	32	1.9	0.9	
Farmland Agro	Seed Boot SB2	4.5	114	10.6	269	Two Plow Bolts	2.1-2.9	54-73	1.25	32	3.8	1.7	
									OD or smaller		Seed Boot		
									OD or smaller		0.5	0.2	
									OD or smaller		Narrow Divider		
Flexi-coil	Seed Boot	4.9	125	10.5	267	Two Plow Bolts	1.7-2.0	43-51	1.25	32	3.1	1.4	
									OD or smaller		Seed Boot		
									OD or smaller		0.1	0.5	
									OD or smaller		Divider		
Victory	Regular Seed Splitter	8.0	203	10.6	269	Two Plow Bolts	1.5-3.0	38-76	1.25	32	5.5	2.5	
Victory	Edge-on Seed Splitter	7.8	198	11.0	279	Two Plow Bolts	2.75	70	1.25	32	3.8	1.7	
						Horizontal Spacing						ID	



FLEXI-COIL SEEDBOOT



BOURGUAULT SEED BOOTS



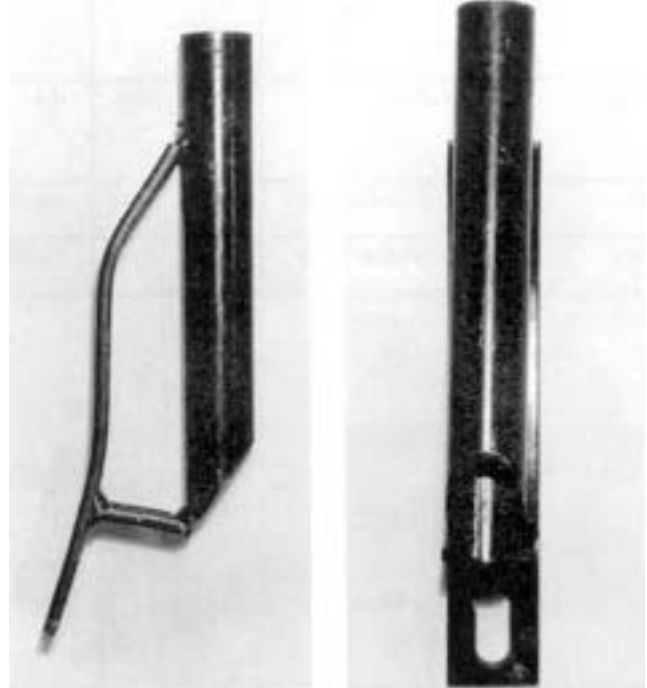
CEREAL IMPLEMENTS SEED BOOT & FLOW DIVIDER



DUTCH K SEED BOOT



DUTCH VERN SEED BOOT



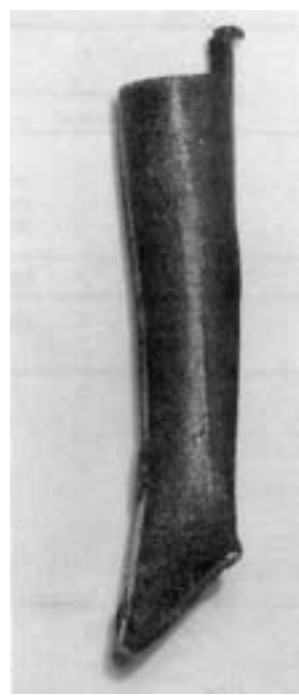
DUTCH SEED TUBE



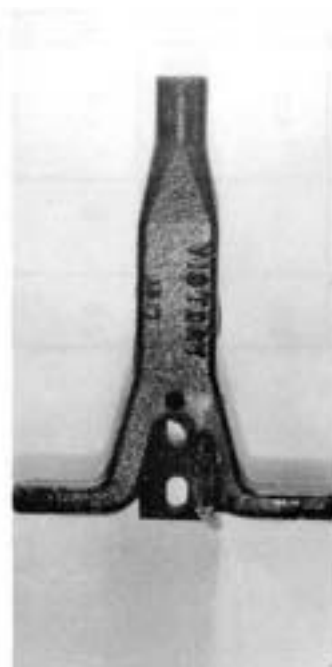
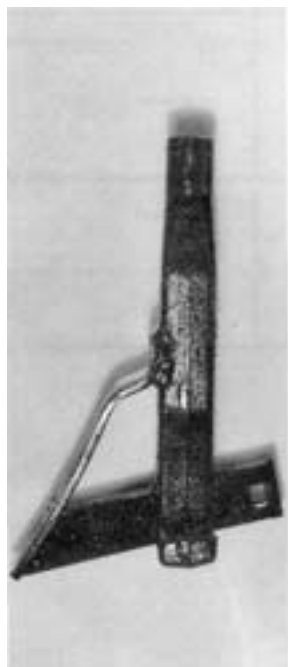
CLARK PAIR ROW SEEDING BLADE



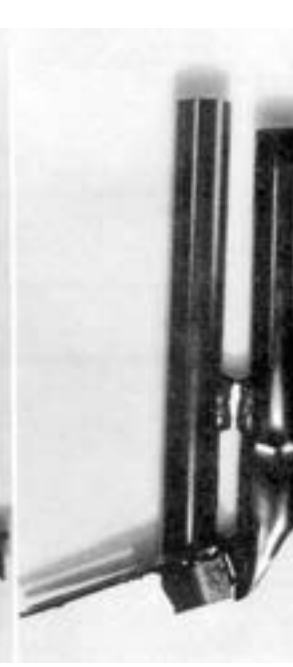
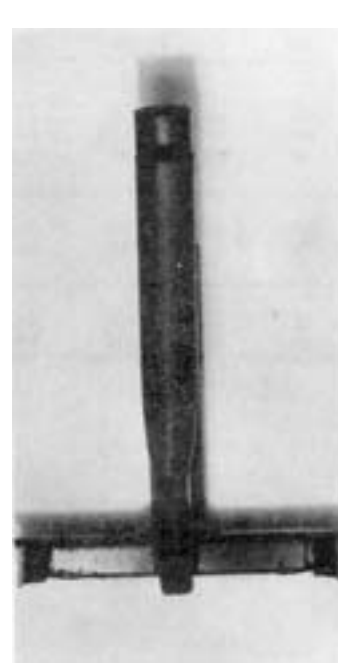
FARMLAND AGRO SB2 SEED BOOT



FARMLAND AGRO SB3 SEED BOOT



VICTORY REGULAR SEED SPLITTER



VICTORY EDGE-ON SEED SPLITTER



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