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Application of Øyjord Seeding System to Horticultural Nurseries

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Contents

The mention of brand names here does not constitute an official Agriculture Canada recommendation but is given as information only.

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Application of the Oyjord Seeding System to Horticultural Nurseries

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Introduction

The Oyjord seeding system (4,5) (Fig. 1) developed in Norway for planting experimental cereal plots. The basic system consists of a seed dispensing cone and a distributer or divider. The purpose of the cone is to uniformily dispense a small seed sample over a given length. This is acheived by dropping a sample from a seed cup, over the apex of a cone in such a way that the seed falls uniformily at the cone base. The cone is then rotated, from a ground driven wheel, one complete turn, causing the seed to be dropped through a hole in the base plate into the distributor oriface.

The distributor divides the seed sample as it falls, into a desired number of rows. This is done by a spinning element which receives the seed at the centre from an interchangeable oriface and flings the seed into uniformily sized seed spouts. The distributor is available with 2, 3, 4, 5, 6, 7, 8, 9, 10, 12 or 14 spouts.

Optional equipment of interest here is a bulk feeder which fits over a post projecting from the cone apex and has a large fluted wheel to dispense seed from a hopper. The feeder is used for larger batches of seed where continuous sowing is desired.

The combination of the Oyjord seeding system and the optional bulk hopper offer two advantages for multiple row nursery operations not available with most other seeders. First, when using the bulk hopper, a single small hopper is used for a number of rows. Where a limited amount of seed is available, this allows the batch to be seeded out to the last

6 to 7 grams, with all rows seeded uniformily to the finish. Where larger amounts of seed are available but land is limited and batches of seed are changed often, beds may be planted to a uniform finish using a minimum of seed as there is only one hopper to maintain. Dumping of excess seed is easier as the hopper is easy to remove, and only one hopper is involved. Checking of individual hoppers or maintaining levels in a wider hopper is eliminated.

A second feature is that multiple rows up to 23.5 m (75 ft.) long may be planted using the batch method. Small batches of seed are placed in the loading cup and dispensed evenly over desired length. Samples must be pre-measured for the cone system. Two sizes of cones are available for this procedure, the normal cone is suitable for up to 15 m (50 ft.) and a larger cone is suitable for up to 23.5 m (75 ft.). The system is completely self cleaning where using this method.

Field Testing

A seeder (3) equipped with a dual Oyjord seeding system was field tested at the G. Howard Ferguson Tree Nursery, Ontario Ministry of Natural Resources, Kemptville, Ontario. A bulk hopper was used to seed several species of tree seed including Jack Pine (Pirus banksiana Lamb.), White Spruce (Picea glauca (Moench) Voss), Blk Locust (Robinia pseudoaeacia), Blk Cherry (Prunus serotina Ehrh.), Basswood (Tilia americana L.), Autumn Olive (Elaeagnus umbellata var cardinal Veburnum trilobum) at rates varying from 2.75 grams to 7.50 grams per lineal metre of seedbeds (6 rows). Seeding speed was limited to the capabilities of the self propelled unit at 2.5 m.p.h.

Lab Testing

The seeding system is known to perform well with seeds similar in size to cereal grains. To test the equipment with smaller seeds, several species of flower seeds were obtained from a co-operating nursery. All were tested in the bulk hopper and the output measured at low feed levels (Table 1). Residue figures represent the amount of seed left after the fluted wheel was no longer able to dispense seed from that left in the hopper. Several species were tried in different cones to test the wiping ability or ability to move the seed along the base plate without leaving seed. Results are shown in column "Cone Trial" where A is acceptable and N is negative. It is noted that cones "1" and "2" were new with less than 100 hours of use and cone "3" was six years old with an estimated 1500 hours of use. A few species were tried in the divider and tested for accuracy. The largest orifice supplied was used to feed

the distributor, thus the figure shown under "Distributer Output" should be considered the maximum error likely between rows. The error is normally between 3 and 5 per cent when the smallest possible oriface is used between the cone and distributor[1] Inspection of the distributer revealed no seeds lodged in the interor. A graph showing full range outputs for a number of species is shown in Figure 2 for comparison purposes.

Discussion

The Oyjord Seeding System can be considered for nursery operations where:

1. Precision seeding is not required.
2. Frequent changes of seed are encountered.
3. Efficient use of small amounts of seed is required.

The distributing system is suitable for all but those that are very flat such as Alyssum and although the indication is not conclusive, it appears that the wiping action of the cone improves with wear. The dispensing ability of the cone is good for most seeds at #1 on the gate scale but accuracy deteriorates at lower levels. With larger seeds, accuracy is acceptable only at higher values on the gate scale.

The Oyjord Seeding System is available from the manufacturer in individual components or as a complete seeding unit, either tractor mounted or self propelled. The cone is not needed in applications where the bulk hopper only will be used but an intermediate drive and a stud shaft to hold and drive the hopper is required. Suggestions for mounting the equipment are given else where (2) .

Acknowledgements

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3. Hergert, G.B. 1974. Ste. Foy forage seeder. Report 7038. Engineering Research Service, Agriculture Canada, Ottawa.
4. Oyjord, E. 1963. A universal experimental seed drill. J. Agric. Eng. Res. 8 (1)
5. Oyjord, E. 1968. Norwegian plot seeder. Proc. 2nd Int. Conference on Mechanization of Field Experiments, Braunshweg, Germany, Paper 15.

Manufacturer

The equipment described here is available from:
Jen A. Schou Mek. Verksted, 1441 Drobak, Norway.

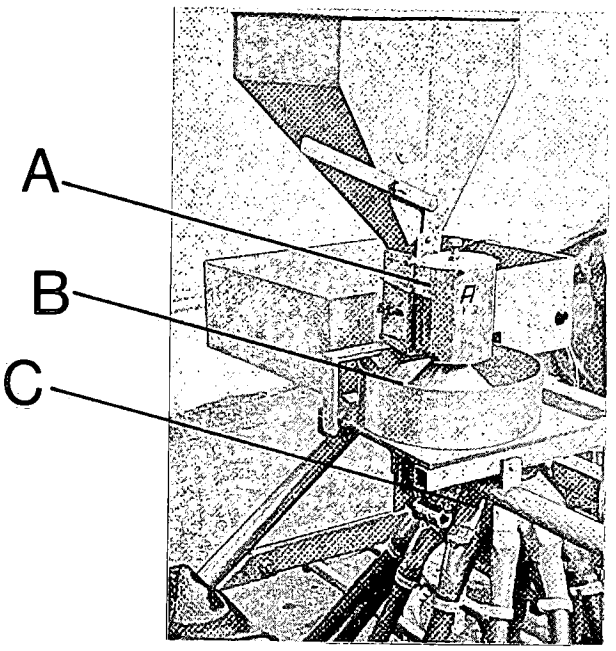

FIG. 1 OYJORD SEEDING SYSTEM SHOWING A. BULK FEEDER, B. CONE DISPENSER, C. DISTRIBUTOR

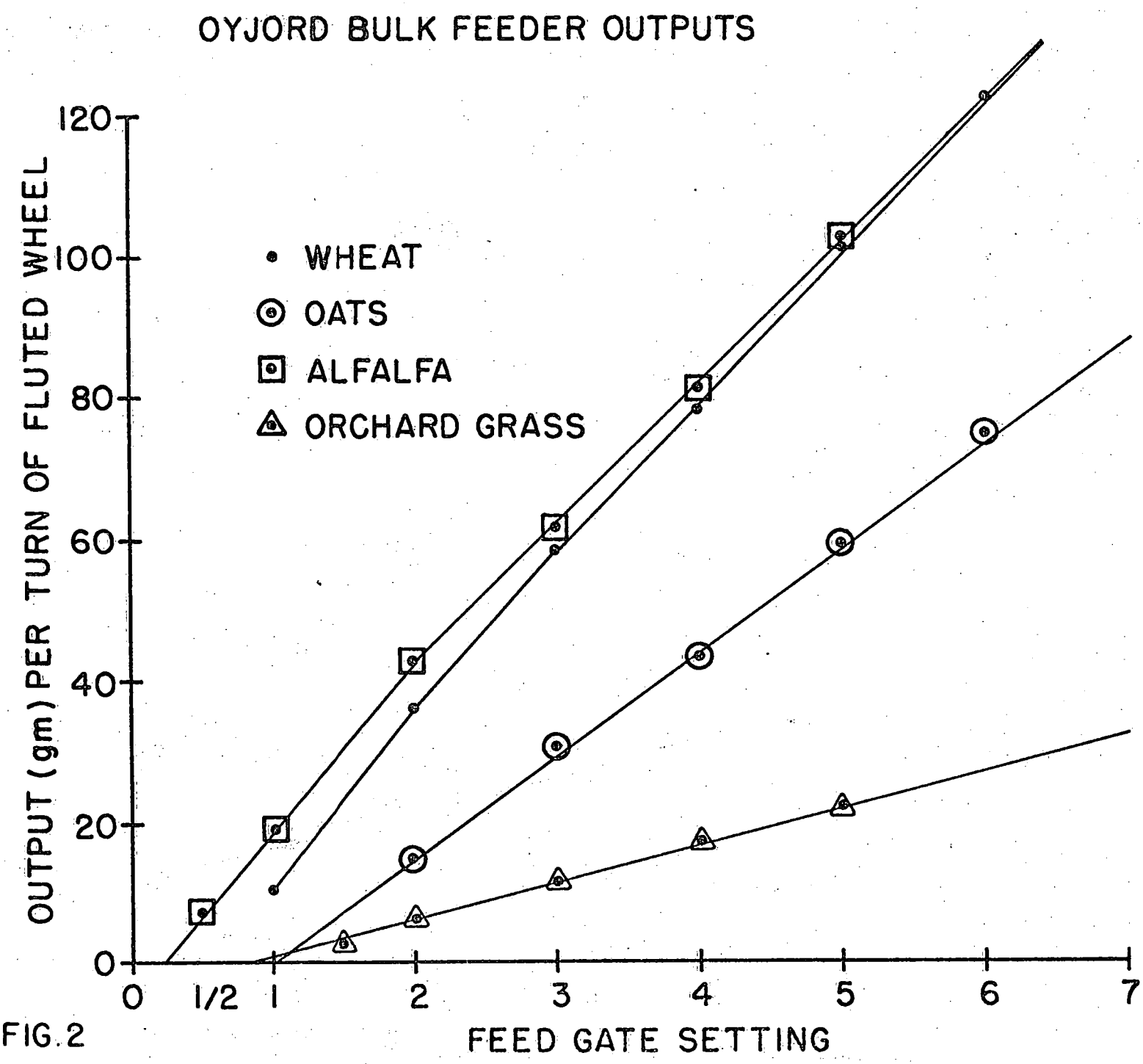
OYJORD BULK FEEDER OUTPUTS
OUTPUT (gm) PER TURN OF FLUTED WHEEL
120
100
80
60
40
20
0
WHEAT
OATS
ALFALFA
ORCHARD GRASS
0
1/2
1
2
3
4
5
6
7
FEED GATE SETTING

FIG. 2

Oyjord Seed Dispensing Equipment

Tests of Horticultural Seeds showing output of Bulk Hopper, Residue left in Hopper, wiping ability of the Cone and Maximum error of the distributor

Seed	Seed Name	Seed/oz	Bulk Hopper outputs for three gate settings Average 10 tests ½	C.V.%	1	C.V.%	1½	C.V.%	Hopper Residue-g	Cone Trial 1 2 3	Distributor Output C.V.% (maximu
										A-Acceptable N-Negative	Error between spou
1	Phacella Compakularia	53,000	5.90	3.05	22.46	3.29				A A A	
2	Cynoglossum Dwarf Firament	5,300	5.57	4.85	17.41	2.29				A A A	8-11
3	Clarkia Elegans	103,700	3.62	3.87	18.38	1.14				A A A	
4	Salpiglossis Emporer	125,000	3.63	3.30	17.55	1.20			8.22	A A A	
5	Nemophila Insignus	16,500	2.40	7.08	22.20	1.40					
6	Candy Tuft Umbellata	12,300	6.85	8.61	26.20	3.02			5.90	N A A	
7	Mignonette-New York	26,300	2.87	4.53	19.06	4.25			5.96	A A A	9-11
8	Alyssum Maritmum	79,700	6.55	3.66	22.51	1.47			5.40	N N A	
9	Poppy - Single Shirley	200,000	6.96	1.72	20.36	1.47			6.73	N A A	
10	Gypsophila-Convent Garden	36,000	7.89	6.21	29.23	1.13			6.21	A A A	
11	Celosia Plumosa	43,000	7.40	3.10	29.99	1.70			5.68	A A A	13-19
12	Linum - Scarlet Flax	8,150	3.06	9.47	21.25	2.54			6.16	A A A	
13	Lupine Hartwegi King	1,600	2.00	4.00	28.09	2.03			8.28		
14	Lathyrus Latifolius	600			12.98	20.41	41.37	4.83	13.42		
15	Rape Seed		2.61	14.56	15.62	2.43	23.95	3.96		A A A	
16	Wheat				12.67	5.44	36.04	1.55		A A A	
17	Fertilizer	Random			18.29	2.19	32.06	1.22		Some powder left	