A G R O B A N D

FERTILISER

PLACEMENT

APPLICATOR

CALIBRATION SUPPLEMENT

HORSTINE FARMERY

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BOOK PART No. 032311

Contents.

Calibration Procedure.

The output of the machine is determined by the drive ratio (sprocket combination) fitted to the land wheel drive.
To calculate the correct drive ratio 3 pieces of information are required :-

A = The target application rate (Kg. /Ha.)
B = Potato row width (cm.)
C = The metering rotor output to 1 crop row when the metering unit shaft is turned 100 times.

Calculating Rotor Output.

1. Ensure that the land wheel drive is fitted with 22 tooth sprockets on either end of the drive.

2. Disconnect the 2 delivery tubes from one metering unit from the placement coulters or fishtails and place the open ends in a suitable container of a known weight.

3. Fill the hopper above the metering unit to be tested with approximately 35 Kilograms of fertilizer.

4. Turn the landwheel 100 times.

5. Weigh the container to calculate the machine output in Kilograms.

Calculating the Drive Ratio.

Having calculated the metering rotor output the correct drive ratio can be determined using the following calculation :-

$$\frac{\text{The target application rate (Kg/Ha.) x Potato row width (cm)}}{\text{4225 x Rotor Output from 100 revolutions of the metering unit (Kg.)}} = \text{Drive ratio required.}$$

Example where :-

A (The target application rate) = 1200 Kg/Ha.

B (Potato row width) = 80 cm

C (Rotor output for 100 revs.) = 27.5 Kg.

A x **B** (1200 X 80) = 96,000

4225 x **C** (4225 x 27.5) = 116,187

96,000 divided by 116187 = **0.826**

The result 0.826 indicates the required drive ratio.

To complete the machine set up look up the drive ratio in the table on page 4. In this case the closest drive ratio is 0.82 which means that a 28 tooth sprocket needs to be fitted to the landwheel (driver sprocket) and a 34 tooth sprocket to the countershaft (driven sprocket).
The secondary drive to the metering units is fixed and is not designed to be adjusted.

Calculating Metering Shaft Speed.

It is important that the metering shaft speed does not exceed 90 revolutions per minute.
With high forward speeds this maximum can be exceeded.
To calculate the maximum forward speed divide the figue 12.78 by the drive ratio being used.

Maximum forward speed = 12.78 ÷ Drive Ratio

Example:- Drive ratio 28 tooth driver to 34 tooth driven = 0.82 ratio.

12.78 divided by 0.82 = 15.58 k.p.h. maximum forward speed.

Typical application rates.

As standard new machines are fitted with 4 metering rotors over each outlet. Rotors can be removed to give lower outputs.
Fertilizer flow rates can vary significantly dependent on the fertilisers physical characteristics and density.
Based on an average fertilizer flow rate typical application rates are as follows:-

4 rotors over each outlet	750 to 2250 kg/ha.
3 rotors over each outlet	560 to 1700 kg/ha.

It is recommended that not less than 2 rotors are used over each outlet as there is a likelihood of uneven rotor filling.
Where lower rates are required the low half rate fertilizer rotor (Part No. 094067) should be fitted in pairs.

Conversion factors.

Kilograms per Hectare multiplied by 0.89 = Pounds per Acre.

Pounds per acre multiplied by 1.123 = Kilograms per Hectare.

Sprocket ratios

Two types of sprockets have been used on Agroband machine older machines using 5/8" pitch x 11/32" wide sprockets and current machines from 01-03-1999 using ½" pitch x 5/16" wide.

These sprockets were of differing sizes to achieve a ratio range, the following page shows the ratio ranges of both types

A/ <u>OLDER MACHINES</u> <u>UP TO</u> SERIAL No. <u>AG0299452</u>
<u>SUPPLIED BEFORE 01-03-1999</u>

Change sprockets **5/8" Pitch** x 11/32" Wide.
a set comprises
1 x 18T, 1 x 20T, 2 x 22T, 1 x 24T, 1 x 26T, 1 x 28T.

SPROCKET "DRIVER"	SPROCKET "DRIVEN"	RATIO	
18	28	0.642	
18	26	0.692	
20	28	0.714	
18	24	0.75	
20	26	0.769	
22	28	0.785	
18	22	0.818	**<u>Decrease</u>**
20	24	0.833	**<u>Rate</u>**
22	26	0.846	
24	28	0.857	
18	20	0.9	
20	22	0.909	
22	24	0.916	
24	26	0.923	
26	28	0.928	
22	22	1.000	*
28	26	1.076	
26	24	1.083	
24	22	1.09	
22	20	1.1	
20	18	1.111	
28	24	1.166	
26	22	1.18	
24	20	1.2	**<u>Increase</u>**
22	18	1.222	**<u>rate</u>**
28	22	1.272	
26	20	1.3	
24	18	1.333	
28	20	1.4	
26	18	1.444	
28	18	1.555	

B/ <u>CURRENT MACHINES</u> <u>FROM</u> SERIAL No. <u>AG0299453</u>
<u>SUPPLIED AFTER</u> 01-03-1999

Change sprockets **1/2" Pitch** x 5/16 Wide.
A set comprises
1 x 19T, 2 x 22T, 1 x 23T, 1 x 25T, 1 x 28T, 1 x 31T, 1 x 34T

SPROCKET "DRIVER"	SPROCKET "DRIVEN"	RATIO	
19T	34T	0.56	
19T	31T	0.61	
22T	34T	0.65	
19T	28T	0.68	
22T	31T	0.71	
25T	34T	0.73	
23T	31T	0.74	
19T	25T	0.76	**<u>Decrease</u>**
22T	28T	0.79	**<u>Rate</u>**
25T	31T	0.80	
28T	34T	0.82	
19T	22T	0.86	
22T	25T	0.88	
25T	28T	0.89	
28T	31T	0.90	
22T	23T	0.956	
22T	22T	1.1	*
23T	22T	1.045	
31T	28T	1.10	
28T	25T	1.12	
25T	22T	1.14	
22T	19T	1.16	
34T	28T	1.21	
31T	25T	1.24	
28T	22T	1.27	**<u>Increase</u>**
25T	19T	1.31	**<u>Rate</u>**
34T	25T	1.36	
31T	22T	1.41	
28T	19T	1.47	
34T	22T	1.55	
31T	19T	1.63	
34T	19T	1.80	

Product :- **Fertiliser - Yara Extran Granular** (Density 965 gms per litre)

Machine type :- **Agroband**

Rotors per outllet :- **4 x** 12mm wide 9 deep fluted Fertiliser rotor per outlet and **2 outlets per row**
Rotor part No. 094019

Rotor output gms / rev. :- 245.6 122.8 GMS FOR 4 ROTORS X 2 i.e. 2 outlets per row

Input revs per 100 metres;- 42.25

Sprocket "Driver"	Sprocket "Driven"	Ratio		Grams per 100 metres per outlet		Kg. / Ha. 36" Row	Kg. / Ha. 34" Row	Kg. / Ha. 32" Row	Kg. / Ha. 30" Row	Kg. / Ha. 28" Row
					cm	**91.4**	**86.3**	**81.2**	**76.2**	**71.1**
19	34	0.56		5798.69		634.43	671.92	714.12	760.98	815.57
19	31	0.61		6359.85		695.83	736.95	783.23	834.63	894.49
22	34	0.65		6714.27		734.60	778.02	826.88	881.14	944.34
19	28	0.68		7041.26		770.38	815.91	867.15	924.05	990.33
22	31	0.71		7364.04		805.69	853.31	906.90	966.41	1035.73
25	34	0.74		7629.85		834.78	884.11	939.64	1001.29	1073.12
23	31	0.74		7698.77		842.32	892.09	948.12	1010.34	1082.81
19	25	0.76		7886.22		862.82	913.81	971.21	1034.94	1109.17
22	28	0.79		8153.04		892.02	944.73	1004.07	1069.95	1146.70
25	31	0.81		8368.23		915.56	969.67	1030.57	1098.19	1176.97
28	34	0.82		8545.44		934.95	990.20	1052.39	1121.45	1201.89
19	22	0.86		8961.61		980.48	1038.43	1103.65	1176.06	1260.42
22	25	0.88		9131.41		999.06	1058.10	1124.56	1198.35	1284.30
25	28	0.89		9264.82		1013.66	1073.56	1140.99	1215.86	1303.07
28	31	0.90		9372.41		1025.43	1086.03	1154.24	1229.98	1318.20
22	23	0.96		9925.44		1085.93	1150.11	1222.35	1302.55	1395.98
22	22	1.00		10376.60		1135.30	1202.39	1277.91	1361.76	1459.44
23	22	1.05		10848.26		1186.90	1257.04	1335.99	1423.66	1525.78
31	28	1.11		11488.38		1256.93	1331.21	1414.82	1507.66	1615.81
28	25	1.12		11621.79		1271.53	1346.67	1431.26	1525.17	1634.57
25	22	1.14		11791.59		1290.11	1366.35	1452.17	1547.45	1658.45
22	19	1.16		12015.01		1314.55	1392.24	1479.68	1576.77	1689.87
34	28	1.21		12600.16		1378.57	1460.04	1551.74	1653.56	1772.17
31	25	1.24		12866.98		1407.77	1490.96	1584.60	1688.58	1809.70
28	22	1.27		13206.58		1444.92	1530.31	1626.43	1733.15	1857.47
25	19	1.32		13653.42		1493.81	1582.09	1681.46	1791.79	1920.31
34	25	1.36		14112.18		1544.00	1635.25	1737.95	1851.99	1984.83
31	22	1.41		14621.57		1599.73	1694.27	1800.69	1918.84	2056.48
28	19	1.47		15291.83		1673.07	1771.94	1883.23	2006.80	2150.75
34	22	1.55		16036.56		1754.55	1858.23	1974.95	2104.54	2255.49
31	19	1.63		16930.24		1852.32	1961.79	2085.01	2221.82	2381.19
34	19	1.79		18568.65		2031.58	2151.64	2286.78	2436.83	2611.62

Conversion factors - Kilograms per Hectare multiplied by 0.89 **=** Pounds per Acre
Pounds per acre multiplied by 1.123 = Kilograms per Hectare

Product :- **Fertiliser - Yara Prill 14-14-21** (Density 1061 gms per litre)

Machine type :- **Agroband**

Rotors per outllet :- **4 x** 12mm wide 9 deep fluted Fertiliser rotor per outlet and **2 outlets per row**
Rotor part No. 094019

Rotor output gms / rev. :- 273.7 136.83 GMS FOR 4 ROTORS X 2 i.e. 2 outlets per row

Input revs per 100 metres;- 42.25

Sprocket "Driver"	Sprocket "Driven"	Ratio	Grams per 100 metres per outlet		Kg. / Ha. 36" Row	Kg. / Ha. 34" Row	Kg. / Ha. 32" Row	Kg. / Ha. 30" Row	Kg. / Ha. 28" Row
				cm	**91.4**	**86.3**	**81.2**	**76.2**	**71.1**
19	34	0.56	6461.19		706.91	748.69	795.71	847.93	908.75
19	31	0.61	7086.47		775.32	821.14	872.72	929.98	996.69
22	34	0.65	7481.38		818.53	866.90	921.35	981.81	1052.23
19	28	0.68	7845.73		858.40	909.12	966.22	1029.62	1103.48
22	31	0.71	8205.39		897.74	950.80	1010.52	1076.82	1154.06
25	34	0.74	8501.57		930.15	985.12	1046.99	1115.69	1195.72
23	31	0.74	8578.36		938.55	994.02	1056.45	1125.77	1206.52
19	25	0.76	8787.22		961.40	1018.22	1082.17	1153.18	1235.90
22	28	0.79	9084.53		993.93	1052.67	1118.79	1192.20	1277.71
25	31	0.81	9324.30		1020.16	1080.45	1148.31	1223.66	1311.43
28	34	0.82	9521.76		1041.77	1103.33	1172.63	1249.57	1339.21
19	22	0.86	9985.48		1092.50	1157.07	1229.74	1310.43	1404.43
22	25	0.88	10174.68		1113.20	1178.99	1253.04	1335.26	1431.04
25	28	0.89	10323.33		1129.47	1196.21	1271.35	1354.77	1451.95
28	31	0.90	10443.22		1142.58	1210.11	1286.11	1370.50	1468.81
22	23	0.96	11059.43		1210.00	1281.51	1362.00	1451.37	1555.48
22	22	1.00	11562.14		1265.00	1339.76	1423.91	1517.34	1626.18
23	22	1.05	12087.69		1322.50	1400.66	1488.63	1586.31	1700.10
31	28	1.11	12800.94		1400.54	1483.31	1576.47	1679.91	1800.41
28	25	1.12	12949.59		1416.80	1500.53	1594.78	1699.42	1821.32
25	22	1.14	13138.79		1437.50	1522.46	1618.08	1724.25	1847.93
22	19	1.16	13387.74		1464.74	1551.30	1648.74	1756.92	1882.94
34	28	1.21	14039.74		1536.08	1626.85	1729.03	1842.48	1974.65
31	25	1.24	14337.05		1568.60	1661.30	1765.65	1881.50	2016.46
28	22	1.27	14715.44		1610.00	1705.15	1812.25	1931.16	2069.68
25	19	1.32	15213.34		1664.48	1762.84	1873.56	1996.50	2139.71
34	25	1.36	15724.50		1720.41	1822.07	1936.52	2063.58	2211.60
31	22	1.41	16292.10		1782.51	1887.84	2006.42	2138.07	2291.43
28	19	1.47	17038.94		1864.22	1974.38	2098.39	2236.08	2396.47
34	22	1.55	17868.75		1955.01	2070.54	2200.59	2344.98	2513.19
31	19	1.63	18864.54		2063.95	2185.93	2323.22	2475.66	2653.24
34	19	1.79	20690.14		2263.69	2397.47	2548.05	2715.24	2910.01

Conversion factors - Kilograms per Hectare multiplied by 0.89 **=** Pounds per Acre
Pounds per acre multiplied by 1.123 = Kilograms per Hectare