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77/R/B/12 Precision Seeding - Barley

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SPRING BARLEY

PRECISION SEEDING

Object: To study the effects of precision sowing, row spacing, seed rate, irrigation and nitrogen on yield - Gt. Knott III.

Sponsors: P.J. Welbank, F.V. Widdowson, G.N. Thorne, J.P. Dickinson.

Design: Single replicate of 60 plots.

Whole plot dimensions: 4.88 x 8.23.

Treatments: All combinations of:-

1. DRILL Drills used for sowing:
 STANHAY Stanhay precision drill
 NORDSTEN Nordsten standard drill
2. ROW SPAC Spacing between rows cm:
 10.5
 21.0
3. SEEDRATE Seed rates (kg):
 57
 114
4. IRRIGTN Irrigation by trickle lines:
 NONE None
 FULL Full (145 mm)
5. N Amounts of nitrogen fertiliser (kg N):
 75
 100
 125

plus all combinations of:-

1. H S57 IF Hand sown at 57 kg seed rate with full irrigation:
 10 x 5 Seed sown 10.5 cm x 5.1 cm
 7 x 7 Seed sown 7.3 cm x 7.3 cm
2. N Amounts of nitrogen fertiliser (kg N):
 75
 100
 125

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plus six extra plots:-

F18 114 Sown by Farm drill (Silsoe 12-row), 18 cm (7 inches) spacing between rows, sown at 114 kg seed rate, no irrigation given, six amounts of nitrogen fertiliser (kg N):

N 0
N 75
N 100
N 125
N 150
N 175

NOTES: (1) Irrigation was applied on 7 July (117 mm) and 26 July (28 mm).
(2) The performance of the Nordsten and Farm (Silsoe) drills was unusually poor because of a difficult plot layout. Seed was shallowly sown and there was much damage by birds at the seedbed stage. The yields reported from these treatments should not be regarded as typical.

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 340 l.

Seed: Ark Royal.

Cultivations, etc.: - Deep-tine cultivated: 10 Dec, 1976. PK applied, rotary harrowed: 9 Mar, 1977. Heavy deep-tine cultivated: 8 Apr. Spike rotary cultivated: 20 Apr. Seed sown: 22 Apr. Test N applied: 23 May. Weedkillers applied: 8 June. Fungicide applied: 22 June. Combine harvested: 16 Sept. Previous crops: Winter oats 1975, potatoes 1976.

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ROW SPAC	10.5	21.0	MEAN	
DRILL				
STANHAY	3.54	3.32	3.43	
NORDSTEN	2.75	2.76	2.75	
MEAN	3.15	3.04	3.09	
SEEDRATE	57	114	MEAN	
DRILL				
STANHAY	3.27	3.59	3.43	
NORDSTEN	2.54	2.97	2.75	
MEAN	2.90	3.28	3.09	
SEEDRATE	57	114	MEAN	
ROW SPAC				
10.5	2.92	3.38	3.15	
21.0	2.89	3.19	3.04	
MEAN	2.90	3.28	3.09	
IRRIGTN	NONE	FULL	MEAN	
DRILL				
STANHAY	3.58	3.27	3.43	
NORDSTEN	2.70	2.80	2.75	
MEAN	3.14	3.04	3.09	
IRRIGTN	NONE	FULL	MEAN	
ROW SPAC				
10.5	3.08	3.21	3.15	
21.0	3.20	2.87	3.04	
MEAN	3.14	3.04	3.09	
IRRIGTN	NONE	FULL	MEAN	
SEEDRATE				
57	2.88	2.92	2.90	
114	3.40	3.16	3.28	
MEAN	3.14	3.04	3.09	
N	75	100	125	MEAN
DRILL				
STANHAY	3.60	3.42	3.26	3.43
NORDSTEN	2.89	2.75	2.62	2.75
MEAN	3.25	3.09	2.94	3.09

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

	N	75	100	125	MEAN		
ROW SPAC							
	10.5	3.40	3.13	2.91	3.15		
	21.0	3.09	3.05	2.97	3.04		
MEAN		3.25	3.09	2.94	3.09		
	N	75	100	125	MEAN		
SEEDRATE							
	57	3.08	2.85	2.77	2.90		
	114	3.41	3.33	3.10	3.28		
MEAN		3.25	3.09	2.94	3.09		
	N	75	100	125	MEAN		
IRRIGTN							
	NONE	3.25	3.17	3.01	3.14		
	FULL	3.24	3.01	2.86	3.04		
MEAN		3.25	3.09	2.94	3.09		
ROW SPAC	10.5			21.0			
SEEDRATE	57	114		57	114		
DRILL							
STANHAY	3.39	3.69		3.14	3.49		
NORDSTEN	2.44	3.06		2.63	2.88		
ROW SPAC	10.5			21.0			
IRRIGTN	NONE	FULL		NONE	FULL		
DRILL							
STANHAY	3.62	3.46		3.55	3.08		
NORDSTEN	2.55	2.95		2.86	2.66		
SEEDRATE	57			114			
IRRIGTN	NONE	FULL		NONE	FULL		
DRILL							
STANHAY	3.36	3.18		3.81	3.37		
NORDSTEN	2.41	2.66		3.00	2.94		
SEEDRATE	57			114			
IRRIGTN	NONE	FULL		NONE	FULL		
ROW SPAC							
	10.5	2.81	3.03	3.36	3.39		
	21.0	2.96	2.81	3.44	2.93		
ROW SPAC	10.5			21.0			
N	75	100	125	75	100	125	
DRILL							
STANHAY	3.69	3.61	3.32	3.51	3.24	3.20	
NORDSTEN	3.10	2.65	2.50	2.67	2.86	2.74	

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE	57			114			
N	75	100	125	75	100	125	
DRILL							
STANHAY	3.47	3.13	3.21	3.74	3.72	3.31	
NORDSTEN	2.69	2.57	2.34	3.08	2.94	2.90	
SEEDRATE	57			114			
N	75	100	125	75	100	125	
ROW SPAC							
10.5	3.27	2.72	2.76	3.53	3.54	3.06	
21.0	2.89	2.98	2.78	3.29	3.12	3.15	
IRRIGTN	NONE			FULL			
N	75	100	125	75	100	125	
DRILL							
STANHAY	3.72	3.60	3.43	3.49	3.25	3.08	
NORDSTEN	2.78	2.74	2.60	2.99	2.77	2.64	
IRRIGTN	NONE			FULL			
N	75	100	125	75	100	125	
ROW SPAC							
10.5	3.38	3.08	2.80	3.42	3.18	3.02	
21.0	3.12	3.25	3.23	3.06	2.85	2.70	
IRRIGTN	NONE			FULL			
N	75	100	125	75	100	125	
SEEDRATE							
57	2.88	2.93	2.83	3.28	2.76	2.72	
114	3.62	3.40	3.20	3.20	3.26	3.00	

EXTRA PLOTS

	N	75	100	125	MEAN		
H S57 IF							
10 X 5		3.10	3.14	3.09	3.11		
7 X 7		3.47	3.36	2.47	3.10		
MEAN		3.28	3.25	2.78	3.10		
F18 114	N 0	N 75	N 100	N 125	N 150	N 175	MEAN
	2.46	3.85	3.25	3.63	3.25	2.79	3.21

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	DRILLS	ROW SPAC	SEEDRATE	IRRIGTN
SED	0.134	0.134	0.134	0.134
TABLE	N	DRILLS ROW SPAC	DRILLS SEEDRATE	ROW SPAC SEEDRATE
SED	0.164	0.190	0.190	0.190
TABLE	DRILLS IRRIGTN	ROW SPAC IRRIGTN	SEEDRATE IRRIGTN	DRILLS N
SED	0.190	0.190	0.190	0.232
TABLE	ROW SPAC N	SEEDRATE N	IRRIGTN N	DRILLS ROW SPAC SEEDRATE
SED	0.232	0.232	0.232	0.268
TABLE	DRILLS ROW SPAC IRRIGTN	DRILLS SEEDRATE IRRIGTN	ROW SPAC SEEDRATE IRRIGTN	DRILLS ROW SPAC N
SED	0.268	0.268	0.268	0.328
TABLE	DRILLS SEEDRATE N	ROW SPAC SEEDRATE N	DRILLS IRRIGTN N	ROW SPAC IRRIGTN N
SED	0.328	0.328	0.328	0.328
TABLE	SEEDRATE IRRIGTN N			
SED	0.328			

EXTRA PLOTS STANDARD ERRORS ARE ESTIMATED FROM THE ERRORS OF THE MAIN FACTORIAL SECTION

TABLE	N	H S57 IF	F18 114	H S57 IF N
SED	0.464	0.379	0.657	0.657

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	11	0.464	15.0

GRAIN MEAN DM% 83.4

PLOT AREA HARVESTED 0.00111