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Getting the best out of our wheats.

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TITLE: Getting the best out of our wheats

PERSONNEL: B.J. Shackley RO, L. Lambert TO.

DATE: 1990

TRIAL NUMBERS: 90KA79, 90KA80, 90KA81, 90KA82, 90KA83, 90KA84, 90KA127, 90KA127,
90KA128, 90LG50, 90LG51, 90LG52, 90LG53, 90LG54, 90LG55, 90LG44,
90LG45, 90LG46, 90LG47, 90LG48, 90LG49, 90LG6, 90LG77, 90LG78, 90N42,
90N43, 90N44, 90N62, 90N63, 90N72, 90N73.

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<u>Trial:</u>	Variety * time of sowing (TOS)				
<u>Objective:</u>	Determine the optimum sowing date for maximum yield for a range of released and unreleased wheat cultivars.				
<u>Trial Numbers:</u>	90KA82 (TOS 1), 90KA83 (TOS 2), 90KA84 (TOS 3); 90LG44 (TOS 1), 90LG45 (TOS 2), 90LG46 (TOS 3); 90LG47 (TOS 1), 90LG48 (TOS 2), 90LG49 (TOS 3); 90N42 (TOS 1), 90N43 (TOS 2), 90N44 (TOS 3). (Results not included due to establishment problems)				
<u>Design:</u>	Fully randomised (time of sowings)				
<u>Treatments:</u>	Aroona, Gutha, Halberd, Kulin, Spear, Tincurrin, Reeves, Corrigin, 79W:781, 79W:793, 79W:804, 77Z:884, 77Z:888, RAC529:911, 81Y:971, 78Z:976.				
<u>Replications:</u>	3				
<u>Plot size:</u>	1.8 * 27 m (1.08 * 25 m harvested)				
<u>Locations:</u>	Wagin, Tarin Rock, Newdegate Research Station and Lake Varley				
<u>Sowing date:</u>	Various (see text)				
<u>Rainfall:</u>	Wagin:	Apr-Oct:-	203 mm	Summer:-	168 mm
	Tarin Rock:		249 mm		183 mm
	N.R.S.:		253 mm		144 mm
	Lake Varley:		268 mm		114 mm
<u>Fertilizer:</u>	Wagin:	154 kg/ha Super, Cu, Zn and Mo ; 144 kg/ha Agran at seeding			
	Tarin Rock:	144 kg/ha Super, Cu, Zn and Mo : 148kg/ha Agran at seeding			
	N.R.S.:	150 kg/ha Agran ; 30 kg/ha Urea at seeding			
	Lake Varley:	50kg/ha Triple Super and 118 kg/ha Agran at seeding			

Results and comments:

Early sowings outyielded later ones at all sites, however the largest difference was between the late April and mid May sowing times at Lake Varley. Although the highest yields were achieved by the crossbreds 78Z:976 at Lake Varley and Wagin, and 79W:793 at Tarin Rock, the yields were not significantly higher than Spear, Tincurrin or Corrigin for the early sowings. At the later sowings there were no yield advantages for any particular cultivar.

Reeves was an outstanding cultivar in the 1989 season, however this performance was not repeated in 1990. Reasons may stem from the poor seed source and evidence of some shattering in 1990.

Grain quality assessment is still to be completed. Delayed sowing of any of the soft wheats consistently increased the grain protein and at any sowing time Corrigin has a higher protein content than Tincurrin.

TIME OF SOWING EXPERIMENTS, 1990. GRAIN YIELD (T/HA)

	WAGIN		TARIN ROCK			LAKE VARLEY		
	16-May	7-June	17-May	31-May	14-Jun	26-Apr	21-May	11-Jun
AROONA	2.50	1.61	3.23	2.83	2.44	3.80	2.67	2.22
CORRIGIN	2.60	1.53	3.74	3.61	2.40	4.22	2.96	2.53
GUTHA	1.96	1.22	3.19	3.28	2.35	2.54	2.41	2.31
HALBERD	2.33	1.44	3.31	3.07	2.19	3.57	2.66	2.57
KULIN	2.25	1.59	3.51	3.39	2.61	2.75	2.78	2.38
REEVES	2.28	1.70	3.15	3.12	2.29	3.57	2.57	2.48
SPEAR	2.70	1.42	3.62	3.35	2.68	4.11	2.65	2.59
TINCURRIN	2.75	1.66	3.68	3.47	2.19	3.91	3.11	2.70
79W:781	2.06	1.54	3.04	2.80	2.66	3.37	2.35	2.20
79W:793	2.26	1.50	4.08	3.58	2.70	3.59	2.70	2.43
79W:804	2.27	1.26	4.04	3.40	2.71	3.61	2.67	2.33
77Z:884	1.76	0.68	3.45	3.07	2.41	3.30	2.34	2.28
77Z:888	2.26	1.34	3.80	3.46	2.36	3.43	2.80	2.52
RAC529:911	1.96	1.13	3.47	3.34	2.67	3.91	2.77	2.51
81Y:971	2.51	1.50	3.76	3.34	2.38	3.44	2.73	2.38
78Z:976	2.98	1.76	3.60	3.31	2.67	4.31	2.93	2.75
LSD	0.590	0.389	0.479	0.263	0.224	0.358	0.287	0.152
CV (%)	13.5	15.3	8.2	5.6	5.1	5.7	5.8	3.3

TIME OF SOWING EXPERIMENTS, 1990 : PLANT DENSITY (m²)

	WAGIN		TARIN ROCK			LAKE VARLEY		
	16-May	7-June	17-May	31-May	14-Jun	26-Apr	21-May	11-Jun
AROONA	112	116	143	131	114	91	198	91
CORRIGIN	154	143	86	128	84	122	126	139
GUTHA	89	132	112	122	141	87	133	94
HALBERD	139	120	112	107	50	72	126	91
KULIN	152	130	128	103	82	133	103	106
REEVES	84	98	86	110	76	72	88	76
SPEAR	129	108	156	99	76	91	110	89
TINCURRIN	72	139	110	103	78	72	116	85
79W:781	97	105	93	101	116	98	114	105
79W:793	131	133	95	97	86	124	97	88
79W:804	95	148	88	97	95	92	108	88
77Z:884	74	102	97	124	80	105	118	84
77Z:888	137	121	107	148	90	94	95	93
RAC529:911	128	122	124	137	59	89	107	103
81Y:971	65	104	82	105	116	83	70	55
78Z:976	97	132	108	107	107	89	89	114
AV	110	122	108	114	91	95	112	94

TIME OF SOWING EXPERIMENT, 1990 ; GRAIN PROTEIN (%)

	TARIN ROCK			LAKE VARLEY		
	17-May	31-May	14-Jun	26-Apr	21-May	11-Jun
AROONA	10.4	10.4	10.3		11.6	12.6
CORRIGIN	8.8	9.3	9.2		10.9	10.2
GUTHA	10.9	10.4	10.3		11.7	11.6
HALBERD	10.7	9.4	9.9		11.5	11.8
KULIN	9.9	10.8	10.5		10.9	11.3
REEVES	9.9	10.4	10.1		10.7	11.6
SPEAR	10.0	10.3	10.4		11.2	11.5
TINCURRIN	8.2	8.6	9.3		8.7	9.5
79W:781	10.3	10.3	10.1		10.8	11.4
79W:793	9.9	9.7	10.5		10.4	11.4
79W:804	9.5	9.7	10.4		10.9	11.8
77Z:884	9.9	9.5	10.9		10.4	11.6
77Z:888	9.5	9.2	10.5		11.1	10.6
RAC529:911	10.0	9.5	12.8		10.8	10.8
81Y:971	9.7	10.3	10.8		10.8	11.4
78Z:976	9.0	9.3	9.4		9.9	10.8
AV	9.8	9.8	10.3		10.8	11.2

TIME OF SOWING EXPERIMENT , 1990 : DATE OF 50% ANTHESIS

	TARIN ROCK			LAKE VARLEY		
	17-May	31-May	14-Jun	26-Apr	21-May	11-Jun
AROONA	25-Sep	3-Oct	15-Oct	6-Sep	27-Sep	5-Oct
CORRIGIN	25-Sep	2-Oct	17-Oct	8-Sep	27-Sep	7-Oct
GUTHA	24-Sep	28-Sep	7-Oct	30-Aug	23-Sep	1-Oct
HALBERD	26-Sep	2-Oct	17-Oct	14-Sep	28-Sep	10-Oct
KULIN	24-Sep	29-Sep	7-Oct	31-Aug	24-Sep	3-Oct
REEVES	26-Sep	1-Oct	16-Oct	6-Sep	26-Sep	6-Oct
SPEAR	28-Sep	3-Oct	17-Oct	14-Sep	1-Oct	10-Oct
TINCURRIN	26-Sep	5-Oct	17-Oct	7-Sep	26-Sep	9-Oct
79W:781	25-Sep	1-Oct	11-Oct	11-Sep	28-Sep	6-Oct
79W:793	26-Sep	1-Oct	9-Oct	2-Sep	26-Sep	3-Oct
79W:804	25-Sep	5-Oct	9-Oct	7-Sep	26-Sep	4-Oct
77W:884	27-Sep	3-Oct	16-Oct	9-Sep	1-Oct	8-Oct
77W:888	24-Sep	29-Sep	7-Oct	30-Aug	24-Sep	3-Oct
RAC529:911	26-Sep	3-Oct	17-Oct	11-Sep	3-Oct	9-Oct
81Y:971	24-Sep	29-Sep	8-Oct	1-Sep	24-Sep	3-Oct
78Z:976	25-Sep	3-Oct	16-Oct	12-Sep	25-Sep	6-Oct

Trial: Nitrogen application

Objective: Determine the response of released and unreleased wheat cultivars to the application of nitrogen.

Trial Numbers: 90KA79, 90LG50, 90LG51, 90N62

Design: Fully randomised

Treatments: Aroona, Gutha, Halberd, Kulin, Spear, Reeves, 79W:781, 79W:793, 79W:804, 77Z:884, 77Z:888, RAC529:911, 81Y:971, 78Z:976.

N rates: Wagin- 0 and 50 kg/ha N (144kg/ha Agran)

 Tarin Rock- 0 and 50 kg/ha N (148 kg/ha Agran)

 N.R.S.- 0 and 40 kg/ha N (120 kg/ha Agran)

 Lake Varley- 0 and 40 kg/ha N (118 kg/ha Agran)

Replications: 3

Plot size: 18.*27m (1.08*25m harvested)

Locations: Wagin, Tarin Rock, Newdegate Research Station and Lake Varley

Sowing dates: Wagin- 23/5/90

 Tarin Rock- 17/5/90

 N.R.S.- 24/5/90

 Lake Varley- 21/5/90

Rainfall: Refer to previous trial

Fertilizer: Wagin- 154 kg/ha Super, Cu, Zn and Mo

 Tarin Rock- 144 kg/ha Super, Cu, Zn and Mo

 N.R.S.- 150 kg/ha Agras

 Lake Varley- 50 kg/ha Triple Super

***NOTE:** Results from Wagin and N.R.S. are not shown due to Cu deficiency and plant establishment problems

Results and comments:

There was a large nitrogen (N) response at Lake Varley for all cultivars, especially Spear (33 units). On average the crossbreds were more N responsive then the named cultivars at both sites. The response to N appears to be related to the amount of seasonal rainfall (although the response at Wagin was also compounded by Cu deficiency).

N APPLICATION EXPERIMENTS, 1990: NITROGEN EFFICIENCY (kg grain/kg N applied)

	TARIN ROCK	LAKE VARLEY
AROONA	12	21
GUTHA	6	16
HALBERD	7	19
KULIN	3	20
REEVES	6	20
SPEAR	6	33
79W:781	1	21
79W:793	14	17
79W:804	26	22
77Z:884	12	25
77Z:888	13	27
RAC529:911	10	32
81Y:971	10	29
78Z:976	6	26
AVERAGE	9	23
RELEASED	7	22
CROSSBREDS	12	25

ECONOMICAL RESPONSE := 6 UNIT

N APPLICATION EXPERIMENTS , 1990 : GRAIN YIELD (t/ha)

CULT	N RATE	LOCATION	
		TARIN ROCK	LAKE VARLEY
AROONA	-	2.44	2.21
	+	3.03	3.06
GUTHA	-	1.94	2.42
	+	2.24	3.07
HALBERD	-	2.38	2.48
	+	2.71	3.23
KULIN	-	2.96	2.48
	+	3.1	3.3
REEVES	-	2.47	2.4
	+	2.78	3.2
SPEAR	-	2.41	2.23
	+	2.69	3.57
79W:781	-	2.22	2.06
	+	2.28	2.9
79W:793	-	2.2	2.67
	+	2.91	3.33
79W:804	-	2.5	2.53
	+	3.78	3.41
77Z:884	-	2.36	2.17
	+	2.98	3.15
77Z:888	-	2.27	2.53
	+	2.93	3.62
RAC5:911	-	2.16	2.18
	+	2.68	3.44
81Y:971	-	2.96	2.4
	+	3.46	3.56
78Z:976	-	2.48	2.36
	+	2.76	3.42
LSD		0.41	0.33
CV (%)		10.57	6.43

N APPLICATION EXPERIMENTS , 1990 : HARVEST INDEX

CULT	N RATE	LOCATION	
		TARIN ROCK	LAKE VARLEY
AROONA	-	0.41	0.37
	+	0.35	0.36
GUTHA	-	0.34	0.35
	+	0.36	0.35
HALBERD	-	0.35	0.4
	+	0.31	0.31
KULIN	-	0.37	0.41
	+	0.38	0.34
REEVES	-	0.41	0.41
	+	0.36	0.44
SPEAR	-	0.37	0.36
	+	0.36	0.34
79W:781	-	0.38	0.31
	+	0.36	0.34
79W:793	-	0.41	0.38
	+	0.39	0.33
79W:804	-	0.38	0.33
	+	0.37	0.36
77Z:884	-	0.32	0.34
	+	0.35	0.34
77Z:888	-	0.4	0.36
	+	0.42	0.34
RAC5:911	-	0.42	0.43
	+	0.38	0.37
81Y:971	-	0.4	0.38
	+	0.38	0.34
78Z:976	-	0.38	0.37
	+	0.4	0.35
AV		0.38	0.36

NITROGEN APPLICATION EXPERIMENT , 1990 : PLANT COUNTS (M2)

CULT	N RATE	LOCATION	
		TARIN ROCK	LAKE VARLEY
AROONA	-	100	84
	+	101	110
GUTHA	-	100	87
	+	106	94
HALBERD	-	83	83
	+	78	79
KULIN	-	100	106
	+	94	81
REEVES	-	75	100
	+	83	84
SPEAR	-	93	104
	+	69	72
79W:781	-	87	99
	+	80	104
79W:793	-	80	109
	+	86	107
79W:804	-	82	91
	+	77	85
77Z:884	-	95	81
	+	69	88
77Z:888	-	90	100
	+	90	108
RAC5:911	-	74	82
	+	71	84
81Y:971	-	83	103
	+	111	100
78Z:976	-	89	76
	+	112	91
AV		88	93

<u>Trial:</u>	Factorial
<u>Objective:</u>	Investigate the response of wheat cultivars to seed rates, nitrogen rates and sowing times in order to achieve maximum yields.
<u>Trial Numbers:</u>	"LIGHT " SOIL TYPE - 90KA80 (TOS 1), 90KA81 (TOS 2) ; "HEAVY" SOIL TYPE - 90KA127 (TOS 1), 90KA128 (TOS 2); "LIGHT" SOIL TYPE - 90LG6 (TOS 1); "HEAVY" SOIL TYPE - 90LG77 (TOS 1), 90LG78 (TOS 2); 90LG52 (TOS 1), 90LG53 (TOS 2); 90LG54 (TOS 1), 90LG55 (TOS 2);
<u>Design:</u>	Fully randomised (time of sowing)
<u>Treatments:</u>	Cultivars- Halberd and Reeves Seed rates- 40 and 80 kg/ha (Wagin), 35 and 70 kg/ha (Lake Grace), 30 and 60 kg/ha (Lake Varley) Nitrogen rates- 0 and 50 kg/ha N (Wagin and Lake Grace), 0 and 40 kg/ha N (Lake Varley) Sowing time- Various, refer to text
<u>Replications:</u>	2
<u>Plot size:</u>	1.8*27m (1.08*25m harvested)
<u>Locations:</u>	Wagin, Kondinin, Tarin Rock and Lake Varley
<u>Fertilizer:</u>	Wagin: 154 kg/ha Super, Cu, Zn and Mo Kondinin: 144 kg/ha Super, Cu, Zn and Mo (light); 100kg/ha Super (heavy) Tarin Rock: 144 kg/ha Super, Cu, Zn and Mo Lake Varley: 50 kg/ha Triple Super

Results and comments:

The largest yield produced by either Reeves or Halberd were sown "early" using the higher seeding rate and with the addition of nitrogen (except at Kondinin with a growing season rainfall of less than 190mm). At no time did the higher seed rate decrease the yield.

From the 1990 data Halberd was found to yield higher than Reeves at Lake Varley (ns), a light land site, and on the heavy land sites at Kondinin and Wagin. Reeves in turn yielded higher than Halberd on the lighter soil types at Tarin Rock, Kondin and Wagin (ns).

Yield increases as a result of increased seed rate and the addition of N often resulted in increased ear and kernel numbers. Kernel weights were not markedly reduced by increased seed rate and N addition.

FACTORIAL EXPERIMENT , 1990 : GRAIN YIELD (t/ha)

a) RESPONSE OVER TWO SOIL TYPES

CULT	N RATE	S RATE	KATANNING		KONDININ	
			LIGHT	HEAVY	LIGHT	HEAVY
REEVES	-	LOW	1.6	1.93	2.	2.38
	-	HIGH	1.96	2.14	2.72	2.41
HALBERD	-	LOW	1.42	2.09	2.18	2.22
	-	HIGH	1.81	2.28	2.18	2.73
REEVES	+	LOW	1.55	1.96	2.03	2.04
	+	HIGH	2.09	2.22	2.09	2.47
HALBERD	+	LOW	1.56	2.2	2.08	2.44
	+	HIGH	1.88	2.62	1.98	2.52
LSD			ns	0.3		
CV			7.42	6.5		

b) RESPONSE OVER TWO SOWING DATES

CULT	N RATE	S RATE	TARIN ROCK		LAKE VARLEY	
			17-May	14-Jun	21-May	11-Jun
REEVES	-	LOW	2.37	1.98	2.03	1.17
	-	HIGH	2.91	2.48	2.05	1.24
HALBERD	-	LOW	2.19	2.28	2.05	1.05
	-	HIGH	2.62	2.3	2.23	1.37
REEVES	+	LOW	2.53	2.33	2.33	1.44
	+	HIGH	3.05	2.64	2.58	1.65
HALBERD	+	LOW	2.29	2.2	2.61	1.53
	+	HIGH	2.66	2.66	2.66	1.58
LSD			0.2	0.33	0.19	0.33
CV			2.51	6.51	3.3	10.

FACTORIAL EXPERIMENT , 1990 : EARS/m²

a) RESPONSE OVER TWO SOIL TYPES

CULT	N RATE	S RATE	WAGIN		KONDININ	
			LIGHT	HEAVY	LIGHT	HEAVY
REEVES	-	LOW	112	112	162	160
	-	HIGH	136	148	213	187
HALBERD	-	LOW	153	182	190	198
	-	HIGH	172	206	238	220
REEVES	+	LOW	150	134	158	166
	+	HIGH	161	168	185	195
HALBERD	+	LOW	144	197	178	218
	+	HIGH	186	248	198	234
AV			152	174	190	197

b) RESPONSE OVER TWO SOWING DATES

CULT	N RATE	S RATE	TARIN ROCK		LAKE VARLEY	
			17-May	14-Jun	21-May	11-Jun
REEVES	-	LOW	162	134	159	82
	-	HIGH	305	195	180	94
HALBERD	-	LOW	179	237	195	116
	-	HIGH	206	235	219	95
REEVES	+	LOW	214	201	168	105
	+	HIGH	*	204	194	118
HALBERD	+	LOW	210	231	211	136
	+	HIGH	358	221	269	101
AV			233	207	199	106

FACTORIAL EXPERIMENT , 1990 : KERNAL WT (mg)

a) RESPONSE OVER TWO SOIL TYPES

CULT	N RATE	S RATE	WAGIN		KONDININ	
			LIGHT	HEAVY	LIGHT	HEAVY
REEVES	-	LOW	32	31	39	36
	-	HIGH	32	30	36	34
HALBERD	-	LOW	31	29	30	31
	-	HIGH	30	29	32	30
REEVES	+	LOW	32	31	36	34
	+	HIGH	33	29	36	33
HALBERD	+	LOW	31	29	31	33
	+	HIGH	30	29	32	30
AV			31	30	34	33

b) RESPONSE OVER TWO SOWING DATES

CULT	N RATE	S RATE	TARIN ROCK		LAKE VARLEY	
			17-May	14-Jun	21-May	11-Jun
REEVES	-	LOW	33	28	33	29
	-	HIGH	33	28	33	26
HALBERD	-	LOW	38	26	34	29
	-	HIGH	35	31	31	25
REEVES	+	LOW	33	29	33	32
	+	HIGH	*	26	29	33
HALBERD	+	LOW	35	30	31	30
	+	HIGH	30	28	29	25
AV			34	28	32	29

FACTORIAL EXPERIMENT , 1990 : KERNAL NO/m2

a) RESPONSE OVER TWO SOIL TYPES

CULT	N RATE	S RATE	WAGIN		KONDININ	
			LIGHT	HEAVY	LIGHT	HEAVY
REEVES	-	LOW	2832	3064	5458	4220
	-	HIGH	3078	3250	6165	5507
HALBERD	-	LOW	2866	4084	5311	4557
	-	HIGH	2864	4119	4954	4348
REEVES	+	LOW	3288	3474	4998	4972
	+	HIGH	3505	3923	5818	3818
HALBERD	+	LOW	2960	4067	5256	4555
	+	HIGH	3474	4310	4578	6674
AV			3108	3786	5317	4831

b) RESPONSE OVER TWO SOWING DATES

CULT	N RATE	S RATE	TARIN ROCK		LAKE VARLEY	
			17-May	14-Jun	21-May	14-Jun
REEVES	-	LOW	3723	4794	4704	2992
	-	HIGH	8850	5384	4320	3062
HALBERD	-	LOW	3346	5506	4658	3090
	-	HIGH	3988	5295	4625	2059
REEVES	+	LOW	5900	5016	4946	3672
	+	HIGH	*	6687	4872	3861
HALBERD	+	LOW	3706	5382	5318	4489
	+	HIGH	6063	7050	6072	3130
AV			5083	5639	4939	3294

FACTORIAL EXPERIMENT , 1990 : HARVEST INDEX

a) RESPONSE OVER TWO SOIL TYPES

CULT	N RATE	S RATE	WAGIN		KONDININ	
			LIGHT	HEAVY	LIGHT	HEAVY
REEVES	-	LOW	0.33	0.28	0.35	0.23
	-	HIGH	0.32	0.25	0.3	0.27
HALBERD	-	LOW	0.28	0.28	0.26	0.25
	-	HIGH	0.28	0.26	0.38	0.19
REEVES	+	LOW	0.36	0.28	0.33	0.25
	+	HIGH	0.32	0.26	0.32	0.23
HALBERD	+	LOW	0.32	0.26	0.29	0.22
	+	HIGH	0.3	0.24	0.28	0.36
AV			0.31	0.26	0.31	0.25

b) RESPONSE OVER TWO SOWING DATES

CULT	N RATE	S RATE	TARIN ROCK		LAKE VARLEY	
			17-May	14-Jun	21-May	11-Jun
REEVES	-	LOW	0.23	0.3	0.29	0.31
	-	HIGH	0.39	0.28	0.28	0.3
HALBERD	-	LOW	0.26	0.25	0.3	0.28
	-	HIGH	0.31	0.33	0.28	0.24
REEVES	+	LOW	0.47	0.32	0.27	0.32
	+	HIGH		0.3	0.25	0.35
HALBERD	+	LOW	0.22	0.33	0.27	0.33
	+	HIGH	0.32	0.31	0.26	0.3
AV			0.31	0.30	0.28	0.30

FACTORIAL EXPERIMENT , 1990 : PLANT COUNTS (m2)

a) RESPONSE OVER TWO SOIL TYPES

CULT	N RATE	S RATE	WAGIN		KONDININ	
			LIGHT	HEAVY	LIGHT	HEAVY
REEVES	-	LOW	82	62	66	54
	-	HIGH	137	58	77	103
HALBERD	-	LOW	83	68	71	66
	-	HIGH	158	68	103	103
REEVES	+	LOW	91	74	111	51
	+	HIGH	134	58	74	101
HALBERD	+	LOW	80	75	84	73
	+	HIGH	122	70	64	104
AV			111	67	81	82

b)RESPONSE OVER TWO SOWING DATES

CULT	N RATE	S RATE	TARIN ROCK		LAKE VARLEY	
			17-May	14-Jun	21-May	11-Jun
REEVES	-	LOW	69	69	70	49
	-	HIGH	131	100	103	66
HALBERD	-	LOW	86	77	70	60
	-	HIGH	123	113	100	94
REEVES	+	LOW	91	63	64	47
	+	HIGH	114	100	87	63
HALBERD	+	LOW	86	54	81	49
	+	HIGH	89	11	124	70
AV			98	73	87	62