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Yields of the Field Experiments 1975

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75/ R/RN/11 - Irrigation - Beans, Barley

Rothamsted Research

Rothamsted Research (1976) 75/ R/RN/11 - Irrigation - Beans, Barley ; Yields Of The Field Experiments 1975, pp 100 - 107 - DOI: <https://doi.org/10.23637/ERADOC-1-141>

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IRRIGATION

Object: To study the effects of irrigation on a rotation of crops. Other agronomic factors are also included - Great Field I and II.

Sponsors: B.J. Legg, E.K. French.

The twelfth year, beans (Great Field I), barley (Great Field II).

For previous years see 64/C/15(t), 65/C/14(t), 66/C/9(t), 67/C/7(t), 68/C/6(t), 69/R/RN/11(t), 70/R/RN/11(t), 71/R/RN/11(t), 72/R/RN/11(t) and 73-74/R/RN/11.

Design: 4 randomised blocks of 4 plots split into half and quarter plots (Great Field I).
2 randomised blocks of 2 plots split into quarter plots (Great Field II).

Whole plot dimensions: Beans - 15.2 x 32.0, barley - 15.2 x 30.5.

Treatments to beans: All combinations of:-

Whole plots: 1. Irrigation (by oscillating spray line):	IRRIGATI
None	NONE
Early	EARLY
Late	LATE
Full	FULL

Half plots: 2. Spacing between rows (with same wt. of seed/ha):	ROWSPACE
18 cm (7 in.)	18 CM
53 cm (21 in.)	53 CM

Quarter plots: 3. Aldicarb:	ALDICARB
None	0
14 kg	14

NOTE: One block did not receive the aldicarb treatment.

Treatments to barley: All combinations of:-

Whole plots: 1. Irrigation:	IRRIGATI
None	NONE
Full	FULL

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Half plots: 2. Form of N:		N FORM
	'Nitro-Chalk'	
	'Gold-N' (sulphur-coated urea)	NITRO-C GOLD-N
Quarter plots: 3. Rate of N (kg):		N RATE
	35	35
	70	70

Standard applications:

Beans: Manures: (0:14:28) at 400 kg. Weedkiller: Simazine at 1.1 kg in 220 l.

Barley: Manures: (0:20:20) at 310 kg combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Tetralex Plus' at 7.0 l in 220 l).

Seed: Beans: Minden, sown at 220 kg.

Barley: Julia, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:-

Beans: Ploughed: 23 Jan, 1975. Spring-tine cultivated: 28 Feb. PK applied: 24 Mar. Aldicarb applied and spike rotary cultivated: 25 Apr. Seed sown: 26 Apr. Simazine applied: 28 Apr. Combine harvested: 30 Aug.

Barley: Ploughed: 24 Jan, 1975. Spring-tine cultivated: 28 Feb. N applied, power harrowed, seed sown: 24 Apr. Weedkiller applied: 4 June. Combine harvested: 21 Aug.

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RAINFALL AND IRRIGATION: MM

Week- ending	Rainfall	IRRIGATION			
		EARLY	SPRING BEANS LATE	FULL	BARLEY FULL
May 3	6.8				
May 10	13.0				
May 17	43.9				
May 24	3.3				
May 31	0.8				
June 7	7.6				
June 14	Trace	25		25	25
June 21	7.8	20		20	25
June 28	8.1				
July 5	Trace	25		25	25
July 12	6.8				
July 19	9.5		30	30	30
July 26	2.9		25	25	25
Aug 2	-		25	25	
Aug 9	10.9				
Aug 16	3.7		30	30	
Aug 23	3.9				
Aug 30	0.6				
Sept 6	Trace				
Sept 13	52.7				
Sept 20	13.0				
Sept 27	33.2				
Oct 4	9.9				
Total	238.4	70	110	180	130

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SPRING BEANS - BLOCKS RECEIVING ALDICARB

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

ROWSpace	18 CM	53 CM	MEAN
IRRIGTN			
NONE	2.31	2.04	2.17
EARLY	2.03	2.22	2.12
LATE	2.82	2.70	2.76
FULL	2.57	2.35	2.46
MEAN	2.43	2.33	2.38

ALDICARB	0	14	MEAN
IRRIGTN			
NONE	1.47	2.87	2.17
EARLY	1.82	2.43	2.12
LATE	2.03	3.48	2.76
FULL	2.27	2.64	2.46
MEAN	1.90	2.86	2.38

ALDICARB	0	14	MEAN
ROWSpace			
18 CM	1.91	2.95	2.43
53 CM	1.89	2.76	2.33
MEAN	1.90	2.86	2.38

ROWSpace	18 CM	53 CM	14
ALDICARB	0	0	14
IRRIGTN			
NONE	1.57	3.05	2.69
EARLY	1.72	2.33	2.52
LATE	1.94	3.70	3.26
FULL	2.40	2.73	2.55

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SPRING BEANS - BLOCKS RECEIVING ALDICARB

GRAIN TONNES/HECTARE

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

TABLE	IRRIGTN	ROWSPACE	ALDICARB	IRRIGTN ROWSPACE
SED	0.501	0.101	0.153	0.520
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: IRRIGTN				0.201

TABLE	IRRIGTN ALDICARB	ROWSPACE ALDICARB	IRRIGTN ROWSPACE ALDICARB
SED	0.545	0.183	0.604
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: IRRIGTN	0.306		0.367
ROWSPACE		0.217	
IRRIGTN.ROWSPACE			0.433
IRRIGTN.ALDICARB			0.367

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

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.613	25.8
BLOCK.WP.HP	8	0.247	10.4
BLOCK.WP.HP.QP	16	0.530	22.3

GRAIN MEAN DM% 84.8

QUARTER PLOT AREA HARVESTED ROWSPACE 18CM - 0.00412, 53CM - 0.00463

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SPRING BEANS - BLOCKS NOT RECEIVING ALDICARB

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

ROWSpace	18 CM	53 CM	MEAN
IRRIGTN			
NONE	1.27	1.02	1.15
EARLY	1.09	1.15	1.12
LATE	1.69	1.28	1.48
FULL	2.25	1.99	2.12
MEAN	1.58	1.36	1.47

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

TABLE	ROWSpace	IRRIGTN ROWSpace
-----	-----	-----
SED	0.201	0.403 *

* ONLY WHEN COMPARING MEANS WITH SAME LEVEL OF IRRIGTN

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

STRATUM	DF	SE	CV%
BLOCK.WP.HP.QP	8	0.403	27.4

GRAIN MEAN DM% 85.5

QUARTER PLOT AREA HARVESTED ROWSPACE 18CM - 0.00412, 53CM - 0.00463

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BARLEY

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

N FORM IRRIGTN	NITRO C	GOLD N	MEAN
NONE	4.00	3.83	3.92
FULL	3.26	3.37	3.31
MEAN	3.63	3.60	3.62

N RATE IRRIGTN	35	70	MEAN
NONE	3.87	3.96	3.92
FULL	3.15	3.48	3.31
MEAN	3.51	3.72	3.62

N RATE N FORM	35	70	MEAN
NITRO C	3.31	3.95	3.63
GOLD N	3.71	3.49	3.60
MEAN	3.51	3.72	3.62

N FORM N RATE IRRIGTN	NITRO C 35	GOLD N 70	GOLD N 35	70
NONE	3.48	4.52	4.26	3.41
FULL	3.14	3.38	3.16	3.57

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

TABLE	IRRIGTN	N FORM	N RATE	IRRIGTN N FORM
REP	8	8	8	4
SED	0.266	0.122	0.337	0.292
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: IRRIGTN				0.173

TABLE	IRRIGTN N RATE	N FORM N RATE	IRRIGTN N FORM N RATE
SED			
ONLY WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
IRRIGTN	0.477		0.507
N FORM		0.477	
IRRIGTN.N FORM			0.675
IRRIGTN.N RATE			0.507

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BARLEY

GRAIN TONNES/HECTARE

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

STRATUM	DF	SE	CV%
BLOCK.WP.HP.QP	4	0.675	18.7

GRAIN MEAN DM% 81.3

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

N FORM	NITRO C	GOLD N	MEAN
IRRIGTN			
NONE	2.22	2.16	2.19
FULL	1.85	2.17	2.01
MEAN	2.03	2.17	2.10

N RATE	35	70	MEAN
IRRIGTN			
NONE	2.11	2.28	2.19
FULL	1.76	2.25	2.01
MEAN	1.94	2.26	2.10

N RATE	35	70	MEAN
N FORM			
NITRO C	1.89	2.18	2.03
GOLD N	1.98	2.35	2.17
MEAN	1.94	2.26	2.10

N FORM	NITRO C	GOLD N	70
N RATE	35	70	35
IRRIGTN			
NONE	2.22	2.22	1.99
FULL	1.55	2.14	1.98
			2.34
			2.36

STRAW MEAN DM% 92.5

QUARTER PLOT AREA HARVESTED 0.00347