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Numerical Results of the Field Experiments 1969

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Beans

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SPRING BEANS

(69/R/BE/1)

B9*, N, row spacing and seed rate, Stackyard 1969.

Design: A single replicate of 4 x 2 x 2 x 2 x 2 in 4 blocks of 4 plots, split for N treatments, with interactions confounded.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments: All combinations of:-

- Whole plots: 1. Row spacing: Rows 5.5(C), 21(W) inches apart.
2. Seed rate: 200 (R1), 400 (R2) lb.
3. Growth regulator: None (O), B9* at 4 lb in 56 gals on 3 occasions (S).
- Sub plots: 4. Nitrogen: None (N0), 1 (N1), 2 (N2), 3 (N3) cwt as 'Nitro-Chalk'.
5. Time of application of N: In seedbed (E) in June (L).

* N-dimethylaminosuccinamic acid.

Basal applications: 360 lb (0:14:28) drilled 3-4 in deep, by 'Tume' drill. Weedkiller: Simazine at 1 lb in 20 gals.
Insecticide: Demeton-s-methyl at 3.5 oz in 37 gals.

Cultivations, etc.: Ploughed: 25 Oct, 1968. Basal fertiliser applied: 10 Mar, 1969. Seed drilled, weedkiller applied: 27 Mar. 'Nitro-Chalk' applied to E plots: 28 Mar, to L plots: 9 June. B9 applied to S plots: 20 May, 12 June, 16 July. Insecticide applied: 25 June. Harvested by sickle: 11 Sept. Variety: Tarvin. Previous crops: Barley 1967, fallow 1968.

NOTE: Germination counts were made and estimates of the percentage of lodging, stem height, number of stems and pods, and of the percentage of N in grain. 1000 grain weights were calculated.

Standard errors per plot. Grain, cwt:

- Whole plot: 0.69 or 2.1% (5 d.f.)
Sub plot: 1.63 or 5.0% (13 d.f.)

SUMMARY OF RESULTS

GRAIN: CWT

	NO	N1	N2	N3	Mean
	(1) & (2)				(±0.24)
C	31.1	33.3	34.1	34.1	33.2
W	31.9	31.4	32.5	32.7	32.1
	(1) & (2)				(±0.24)
R1	32.0	31.6	32.6	33.0	32.3
R2	31.0	33.1	34.0	33.8	33.0
	(1) & (2)				(±0.24)
O	31.1	32.6	34.2	33.1	32.8
S	31.9	32.1	32.4	33.7	32.5
	(1) & (2)				(±0.33)
E		32.8	33.7	34.0	33.5
L		31.9	32.9	32.8	32.5
Mean (±0.41)	31.5	32.3	33.3	33.4	32.6

- (1) (±0.56) For use in vertical and diagonal comparisons only
- (2) (±0.58) For use in horizontal and interaction comparisons only

Mean D.M.%: 79.6

SPRING BEANS

(69/W/BE/1)

Effects of fumigation and nitrogen - Woburn Butt Furlong 1969.

Design: 3 blocks of 6 plots.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments: All combinations of:-

1. Fumigant: None (0), dazomet at 400 lb (F).
2. Nitrogen: None (N0), 1.0 (N1), 2.0 (N2) cwt N as 'Nitro-Chalk' 21, half seedbed, half top dressing.

Basal applications: 360 lb (0:14:28). Weedkiller: Simazine at 0.75 lb in 25 gals. Insecticides: Menazon (Saphicol at 1 pint in 28 gals), demeton-s-methyl at 4.4 oz in 20 gals.

Cultivations, etc.: Ploughed: 14 Oct, 1968. Fumigant applied: 16 Oct. Rotary cultivated twice to 4 inches and 8 inches: 17 Oct. Rolled: 18 Oct. Ploughed second time: 17 Jan, 1969. PK applied, seed drilled at 200 lb: 31 Mar. First application of N: 3 Apr. Weedkiller applied: 4 Apr. Menazon applied: 24 May. Second application of N: 30 May. Demeton-s-methyl applied: 2 July. Hand harvested: 4 Sept. Variety: Tarvin. Previous crops: Barley 1967, 1968.

- NOTES: (1) Soil samples were taken for counts of ectoparasitic nematodes.
- (2) Plant samples were taken for observations of fungal pathogens.
- (3) Counts were made of germination, number of stems, number of pods, 1000 grain weights and percentage nitrogen in grain.

Standard error per plot:

Grain, cwt: 1.94 or 14.3% (10 d.f.)

SUMMARY OF RESULTS

GRAIN, CWT

	NO	N1	N2	Mean
		(±1.12)		(±0.65)
O	13.4	10.0	8.2	10.5
F	16.0	16.1	18.1	16.7
Mean (±0.79)	14.7	13.1	13.1	13.6

Mean D.M. %: 80.8

SPRING BEANS

(69/R/BE/2)

Growth regulators, Stackyard 1969.

Design: 2 blocks of 16 plots, randomisation restricted.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments: Growth regulators and rates of application:-

None (2 plots per block)	(O)
B9 at 2 lb a.i. on 3 occasions	(B1)
B9 at 4 lb a.i. on 3 occasions	(B2)
Morphactin IT 3233 at 0.025 gm a.i.	(MA1)
Morphactin IT 3233 at 2.5 gm a.i.	(MA2)
Morphactin IT 3456 at 0.25 gm a.i.	(MB1)
Morphactin IT 3456 at 25 gm a.i.	(MB2)
Ethrel at 0.1 lb a.i.	(E1)
Ethrel at 1.0 lb a.i.	(E2)
C Oll at 1 lb a.i.	(C1)
C Oll at 4 lb a.i.	(C2)
R34610/1A (JF 2578) at 1 lb a.i.	(RA1)
R34610/1A (JF 2578) at 4 lb a.i.	(RA2)
R34691/1A (JF 2579) at 1 lb a.i.	(RB1)
R34691/1A (JF 2579) at 4 lb a.i.	(RB2)

Each applied in 56 gals.

Basal applications: 360 lb (0:14:28) drilled 3-4 in. deep by 'Tume' drill. Weedkiller: Simazine at 1 lb in 20 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 37 gals.

Cultivations, etc.: Ploughed: 25 Oct, 1968. Basal fertiliser applied: 10 Mar, 1969. Seed drilled at 200 lb, weedkiller applied: 27 Mar. Growth regulators applied: 20 May. B9 applied second time: 13 June. Insecticide applied: 25 June. B9 applied third time: 10 July. Harvested by sickle: 11 Sept. Variety: Tarvin. Previous crops: Barley 1967, fallow 1968.

NOTE: Germination counts were made, and estimates of the percentage of lodging, stem height, number of stems and pods, and of the percentage of N in grain. 1000 grain weights were calculated.

Standard error per plot.

Grain, cwt: 1.94 or 6.3% (15 d.f.)

SUMMARY OF RESULTS

GRAIN:CWT

	O	B	MA	MB	E	C	RA	RB	Mean
	(±1.37)								(±0.52)
1		32.3	33.3	32.1	34.1	34.7	30.4	31.2	32.6
2		32.5	15.7	32.1	27.5	29.2	31.8	33.3	28.9
Mean (±0.97)	32.8	32.4	24.5	32.1	30.8	32.0	31.1	32.2	31.0*

Mean D.M.%: 80.5

*General Mean

SPRING BEANS

(69/W/BE/2)

Effects of insecticide on Sitona - Woburn Horsepool 1969.

Design: 6 blocks of 2 plots.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatment:-

Insecticide: None (0), dieldrin at 1 lb sprayed on to the soil before sowing (I).

Basal applications: Weedkiller: Paraquat at 1.5 lb ion in 25 gals. 4 cwt (0:14:28) placed. Weedkiller: Simazine at 1 lb in 25 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 30 gals.

Cultivations, etc.: Paraquat applied: 16 Oct, 1968. Ploughed: 4 Dec. Spring-tine cultivated: 10 Mar. Dieldrin treatment applied: 12 Mar. Spring-tine cultivated second stroke: 26 Mar. PK applied, seed drilled at 200 lb: 1 Apr. Simazine applied: 4 Apr. Insecticide applied: 25 June. Harvested by hand: 3 Sept. Variety: Maris Bead. Previous crops: Potatoes 1967, winter wheat 1968.

- NOTES: 1. Sticky and water traps were placed in the crop from germination until ripening.
2. Plant samples were taken for counts of Sitona larvae and estimates of damage during the growing season.

Standard error per plot.

Grain, cwt: 1.49 or 6.0% (5 d.f.)

SUMMARY OF RESULTS

GRAIN: CWT

0	I	Mean
	(±0.61)	
24.5	25.7	25.1

Mean D.M.%: 81.7

SPRING BEANS

(69/R/BE/3 and 69/W/BE/3)

The effect on yield of inoculating beans with different strains of *Rhizobium leguminosarum* - Rothamsted (R) Stackyard and Woburn (W) Horsepool 1969.

Design: 4 randomised blocks of 6 plots.

Area of each plot:

Stackyard (R): 0.0202. Area harvested: 0.0127.
Horsepool (W): 0.0193. Area harvested: 0.0121.

Treatments: Seed inoculum (*Rhizobium leguminosarum*):-

None	(0)
Strain 1015	(1)
Strain 1028	(2)
Strain 1034	(3)
Strain 1038	(4)
Strain DP	(5)

Basal applications:

Stackyard (R): 360 lb (0:14:28) injected by 'Tune' drill.
Horsepool (W): 450 lb (0:14:28) placement drilled.
Weedkiller (both fields): Simazine at 1 lb in 20 gals (25 gals on Horsepool (W)).
Insecticide (both fields): Demeton-s-methyl at 3.5 oz in 37 gals (30 gals on Horsepool (W)).

Cultivations, etc.:

Stackyard (R): Ploughed: 25 Oct, 1968. Basal PK compound injected: 10 Mar, 1969. Seed drilled at 200 lb, weedkiller applied: 27 Mar. Insecticide applied: 25 June. Combine harvested: 10 Sept. Variety: Tarvin. Previous crops: Barley 1967, fallow 1968.
Horsepool (W): Ploughed: 2 Dec, 1968. Seed drilled at 200 lb: 1 Apr, 1969. Weedkiller applied: 4 Apr. Insecticide applied: 19 June. Combine harvested: 8 Sept. Variety: Maris Bead. Previous crops: Potatoes 1967, winter wheat 1968.

NOTE: Counts of *Rhizobium leguminosarum* in soil were made in March before sowing and in June from the rhizosphere. Nodules on roots were also counted.

Standard errors per plot. Grain, cwt:

Stackyard (R): 1.04 or 3.5% (15 d.f.)
Horsepool (W): 1.13 or 5.4% (15 d.f.)

SUMMARY OF RESULTS

GRAIN:CWT

0	1	2	3	4	5	Mean
STACKYARD (R)						
(±0.52)						
30.2	29.9	30.0	30.1	29.6	29.5	29.9

Mean D.M.%: 83.8

HORSEPOOL (W)

(±0.56)

21.7	20.0	21.6	20.3	20.9	21.8	21.1
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Mean D.M.%: 81.2

SPRING BEANS

(69/R/BE/4 and 69/W/BE/4)

Deep-drilled fertiliser - Rothamsted (R) Little Hoos and Woburn (W) Horsepool 1969.

Design: 4 randomised blocks of 7 plots.

Area of each plot: 0.0193. Area harvested: 5.5 in rows - 0.0133, 21 in rows - 0.0121.

Treatments: All combinations of:-

1. Space between rows of seed:
5.5 in. (sown by 'Tume' drill) (C),
21 in. (sown by 'Smythe' drill) (W).
2. Methods of applying fertiliser (0:14:28): Broadcast (B1), injected 3-4 in. deep in rows 5.5 in. apart by 'Tume' drill (D1).

Additional treatments:-

- WP1: Seed sown in rows 21 in. apart, with fertiliser placed near seed by 'Smythe' drill.
- CD2: Seed in rows 5.5 in. apart (by 'Tume' drill), fertiliser as above plus 1 cwt K2O as muriate of potash all deeply drilled.
- WD2: Fertilizer as CD2, but seed sown in rows 21 in. apart (by 'Smythe' drill).

- NOTES: (1). Rate of application of (0:14:28) 400 lb Little Hoos (R), 430 lb Horsepool (W).
- (2). On B plots fertiliser was broadcast by the 'Tume' drill, tines in, spouts out, 'crumblers' on.
- (3). On plots where seed and fertiliser were both sown by 'Tume' drill the two operations were separate ('crumblers' on both times).
- (4). On D2 plots the extra K was applied by the 'Tume' drill in a separate operation ('crumblers' off).
- (5). On P plots the 'Tume' drill was used once without fertiliser, tines in, 'crumblers' on.

Basal applications:

- Weedkillers: Little Hoos (R): Paraquat at 0.5 lb ion in 25 gals
Simazine at 1 lb in 20 gals.
Horsepool (W): Simazine at 1 lb in 25 gals.
- Insecticide: Little Hoos (R): Demeton-s-methyl at 3.5 oz in 37 gals.
Horsepool (W) : Demeton-s-methyl at 3.5 oz in 30 gals.

Cultivations, etc.:

Little Hoos (R): Paraquat applied: 11 Oct, 1968. Ploughed: 12 Nov. Fertilisers applied, seed drilled at 200 lb: 25 Mar, 1969. Simazine applied: 27 Mar. Insecticide applied: 21 June. Combine harvested: 5 Sept. Variety: Maris Bead. Previous crops: Spring wheat 1967 and 1968.

Horsepool (W): Ploughed: 2 Dec, 1968. Fertilisers applied, seed drilled at 200 lb: 2 Apr, 1969. Simazine applied: 4 Apr. Insecticide applied: 19 June. Combine harvested: 8 Sept. Variety: Maris Bead. Previous crops: Potatoes 1967, winter wheat 1968.

Standard errors per plot. Grain, cwt:

Little Hoos (R): 1.19 or 5.1% (18 d.f.)

Horsepool (W) : 1.20 or 5.9% (18 d.f.)

SUMMARY OF RESULTS

GRAIN:CWT

CB1	CD1	CD2	WB1	WD1	WD2	WP1	Mean
LITTLE HDOS (R)							
(±0.60)							
22.0	25.5	23.5	21.5	24.3	24.8	22.8	23.5

Mean D.M.%: 83.2

HORSEPOOL (W)

(±0.60)

19.2	21.4	20.5	19.8	20.7	20.0	21.3	20.4
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Mean D.M.%: 81.5

SPRING BEANS

(69/R/BE/5)

Effects of aphids, Little Hoos 1969.

Design: 5 x 5 Latin square.

Area of each plot: 0.0161. Area harvested: 0.0080.

Treatments: Insecticides:

None	(O)
Sprayed with demeton-s-methyl at 3.5 oz in 50 gals:	
At start of flowering	(SE)
At end of flowering	(SL)
At start and end of flowering	(SEL)
Treated with 17 oz phorate in granules	(G)

Basal applications: 360 lb (0:14:28) placement drilled. Weedkillers:
Paraquat at 0.5 lb ion in 25 gals. Simazine at 1 lb in 20 gals.

Cultivations, etc.: Paraquat applied: 11 Oct, 1968. Ploughed:
12 Nov. Seed drilled at 200 lb: 25 Mar, 1969. Simazine applied:
27 Mar. Phorate applied to G plots: 18 June. Demeton-s-methyl
applied: E and EL plots: 19 June, EL and L plots: 14 July.
Combine harvested: 5 Sept. Variety: Maris Bead. Previous
crops: Spring wheat 1967 and 1968.

NOTE: Aphid counts were made once a week throughout the growing
season.

Standard error per plot.

Grain, cwt: 1.37 or 6.2% (12 d.f.)

SUMMARY OF RESULTS

GRAIN: CWT

O	SE	SL	SEL	G	Mean
		(±0.61)			
20.4	22.2	22.2	23.9	22.0	22.2

Mean D.M.%: 82.4

SPRING OILSEED RAPE

(69/R/RA/2)

Seed rates, row spacing, N and chlormequat, Fosters West Side 1969.

Design: A single replicate of 2 x 3 x 3 x 3 in 3 blocks of 18 plots.

Area of each plot: 0.0193. Area harvested: 0.0138.

Treatments: All combinations of:-

1. Seed rate: 5 lb (L), 10 lb (H).
2. Row spacing: 4 (C), 8 (M), 16 (W) inches.
3. Nitrogen: 1.0 (N5), 1.4 (N7), 1.8 (N9) cwt N as 'Nitro-Chalk'.
4. Chlormequat*: None (C0), 1 (C1), 2 (C2) lb chlormequat in 40 gals.

* 2-chloroethyltrimethylammonium chloride (CCC).

Basal applications: 2.5 cwt (0:20:20). Insecticide: Malathion at 18 oz in 37 gals.

Cultivations, etc.: Rotary cultivated twice: 20 Aug and 22 Oct, 1968. Ploughed: 29 Oct. Basal PK applied: 12 Apr, 1969. 'Nitro-Chalk' applied: 15 Apr. Seed drilled: 16 Apr. W treatments hoed with 'Colwood' hoe: 23 Apr. Chlormequat applied: 11 June. Insecticide applied: 18 June. Combine harvested: 27 Aug. Variety: Nilla. Previous crops: Spring wheat 1967, barley 1968.

Standard errors per plot.

Grain (at 90% dry matter), cwt: 2.31 or 13.9% (25 d.f.)
Yield of fixed oil, lb: 97.4 or 14.2% (25 d.f.)

NOTE: Owing to a combine blockage grain was carried over on to plot 52 (H M N5 C1). An estimated value was used in the analysis.

SUMMARY OF RESULTS

GRAIN: CWT

	C	M	W	N5	N7	N9	C0	C1	C2	Mean
	(±0.77)			(±0.77)			(±0.77)			(±0.44)
L	17.6	16.3	16.3	17.7	17.4	15.1	16.1	15.9	18.3	16.7
H	18.2	14.8	16.5	17.7	16.9	14.9	16.0	16.7	16.7	16.5
				(±0.94)			(±0.94)			(±0.54)
			C	18.6	18.0	17.1	17.1	17.2	19.3	17.9
			M	16.6	17.5	12.5	16.1	14.6	15.8	15.5
			W	17.9	16.0	15.3	14.8	17.0	17.3	16.4
							(±0.94)			(±0.54)
						N5	17.0	17.5	18.5	17.7
						N7	15.8	17.7	18.0	17.2
						N9	15.3	13.7	15.9	15.0
Mean (±0.54)							16.0	16.3	17.5	16.6

Mean D.M. %: 73.8

% FIXED OIL

	C	M	W	N5	N7	N9	C0	C1	C2	Mean
L	39.0	38.9	38.4	39.5	38.7	38.2	38.9	38.7	38.7	38.8
H	39.3	38.8	38.4	39.8	38.9	37.7	38.7	38.8	39.0	38.8
			C	40.2	39.4	37.9	39.1	39.1	39.3	39.2
			M	39.6	38.9	38.0	39.0	38.8	38.7	38.8
			W	39.3	38.2	37.9	38.3	38.5	38.6	38.4
					N5		39.6	39.6	39.8	39.7
					N7		38.9	38.8	38.8	38.8
					N9		37.9	38.0	38.0	37.9
Mean							38.8	38.8	38.9	38.8

YIELD OF FIXED OIL: LB

	C	M	W	N5	N7	N9	CO	C1	C2	Mean
	(± 32.5)			(± 32.5)			(± 32.5)			(± 18.7)
L	734	675	670	745	721	613	667	657	755	693
H	761	612	674	749	701	598	659	691	697	682
				(± 39.8)			(± 39.8)			(± 23.0)
			C	796	758	689	713	719	811	748
			M	698	724	509	670	606	655	644
			W	747	650	618	607	697	711	672
							(± 39.8)			(± 23.0)
						N5	719	735	786	747
						N7	654	733	745	711
						N9	617	553	647	605
Mean (± 23.0)							663	674	726	688