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72/R/BE/6 Spring Beans Effects of Heat Treatment

Rothamsted Research

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72/R/BE/6

SPRING BEANS

EFFECTS OF HEAT TREATMENT

Object: To study the effects of various heat treatments of seed on germination, incidence of seed-borne viruses and yield of beans - Garden Plot 9 and Long Hoos V 4.

Sponsors: A.J. Cockbain, S. Vorra Urai.

Design (each field): 4 randomised blocks of 8 plots.

Whole plot dimensions:

Garden Plot 9: 2.03 x 10.1. Area harvested: 0.00090.
Long Hoos V 4: 2.03 x 10.1. Area harvested: 0.00102.

Treatments: Heat treatment (HT):

None			(0)
Period (days)	Temperature (°C)		
4	46.5 - 47.5		(1)
8	46.5 - 47.5		(2)
12	46.5 - 47.5		(3)
8	46.5 - 47.5 (after 14 days at 37°C)		(4)
16	25, 47 alternating		(5)
8	45 - 46		(6)
8	48 - 49		(7)

Basal applications: Garden Plot 9: 630 kg (0:20:20) ploughed down in autumn 1971. Long Hoos V 4: 1570 kg (0:14:28) ploughed down in autumn. Weedkiller (both fields): Simazine at 0.84 kg in 340 l. Insecticide (both fields): Demeton-s-methyl at 0.25 kg in 340 l.

Seed: Maris Bead sown at 220 kg.

Garden Plot 9: Seed from Bridget's Experimental Husbandry Farm with 8% BBSV/EAMV infection.

Long Hoos V 4: Seed once grown from Rothamsted farm with 2% BBSV/EAMV infection.

Cultivations, etc.:

Garden Plot 9: Basal PK applied: 7 Dec, 1971. Ploughed: 9 Dec. Seed drilled: 21 Apr, 1972. Weedkiller applied: 25 Apr. Insecticide applied: 28 June. Combine harvested: 19 Oct. Previous crops: Beans 1970, potatoes 1971.

Long Hoos V 4: Basal PK applied: 30 Sept, 1971. Ploughed: 7 Oct. Seed drilled: 19 Apr, 1972. Weedkiller applied: 26 Apr. Insecticide applied: 26 June. Combine harvested: 4 Oct. Previous crops: Spring wheat 1970, peas 1971.

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NOTE: Seedlings with symptoms of broad bean stain virus/broad bean true mosaic virus were counted and rogued on 24 May, 14 June and 14 July. Plant height and leaflet width (1st leaf) were recorded on 23 May.

Standard errors per plot.

Grain, tonnes/hectare: Garden Plot 9: 0.308 or 11.0% (21 d.f.)
Long Hoos V 4: 0.345 or 10.6% (21 d.f.).

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TABLES OF MEANS

GRAIN: TONNES/HECTARE

GARDEN PLOT 9

HT

0	1	2	3	4	5	6	7	Mean
2.95	2.98	2.65	2.81	2.97	2.66	2.72	2.77	2.81

STANDARD ERROR OF DIFFERENCES
HT 0.218

Mean D.M.%: 79.2

LONG HDOS V 4

HT

0	1	2	3	4	5	6	7	Mean
3.29	3.13	3.01	2.90	3.43	3.43	3.31	3.46	3.24

STANDARD ERROR OF DIFFERENCES
HT 0.244

Mean D.M.%: 80.1