ROTHAMSTED RESEARCH

Yields of the Field Experiments 1987

Full Table of Content

87/R/CS/324 Comparison of Combinable Crops - W. Oilseed Rape, W. Oats, S. Beans, W. Peas, S. Peas, Sunflowers, Lupins, W. Wheat

Rothamsted Research

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87/R/CS/324

COMPARISON OF COMBINABLE CROPS

Object: To compare yields and other attributes of a range of combinable crops and to study their effects on a following crop of w. wheat - Long Hoos VI/VII 2.

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The first year, w. oats, w. oilseed rape, w. peas, w. wheat, s. beans, s. lupins, s. peas, sunflowers and fallow.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 2.5 x 8.0.

Treatments:

CROP	Crops:
W OATS	W. oats
W RAPE	W. oilseed rape
W PEAS	W. peas, Pisum sativum
W WHEAT	W. wheat
S BEANS	S. field beans, Vicia faba
S LUPINS	S. lupins, Lupinus albus
S PEAS	S. peas, Pisum sativum
SNFLOWER	Sunflower

NOTE: Two plots in each block were fallowed, one of them after w. beans which failed.

Standard applications:-

All crops and fallow: Manures: Muriate of potash at 520 kg.

W. oats: Manure: N at 120 kg as 'Nitro-Chalk'. Weedkillers: Terbutryne at 1.5 kg with paraquat at 0.40 kg ion in 220 l. Cyanazine at 0.35 kg, clopyralid at 0.06 kg, mecoprop at 1.7 kg in 220 l applied with the fungicides. Fungicides: Prochloraz at 0.40 kg, carbendazim at 0.15 kg.

W. rape: Manure: N at 200 kg as 'Nitro-Chalk'. Weedkillers: Fluazifop-butyl at 0.25 kg in 220 l. Propyzamide and clopyralid applied twice (as 'Matrikerb' at 1.6 kg) in 220 l. Insecticide: Deltamethrin at 0.075 kg in 220 l on two occasions. Fungicide: Prochloraz at 0.50 kg in 220 l. Desiccant: Diquat at 0.40 kg ion in 220 l.

W. peas: Weedkillers: Paraquat at 0.40 kg ion. Trietazine at 1.2 kg with simazine at 0.17 kg in 220 l. Insecticides: Cypermethrin at 0.025 kg in 220 l applied twice, pirimicarb at 0.14 kg in 220 l. Fungicide: Benomyl at 0.55 kg applied with the pirimicarb. Desiccant: Diquat at 0.40 kg ion in 220 l.

W. wheat: Manure: N at 230 kg as 'Nitro-Chalk'. Weedkillers: Terbutryne at 2.8 kg with paraquat at 0.40 kg ion in 220 l. Isoproturon at 2.5 kg with mecoprop at 2.0 kg in 220 l. Cyanazine at 0.35 kg, clopyralid at 0.06 kg with mecoprop at 1.7 kg in 220 l applied with the fungicides. Fungicides: Prochloraz at 0.40 kg, carbendazim at 0.15 kg.

https://doi.org/10.23637/ERADOC-1-37

87/R/CS/324

Standard applications cont'd:-
S. beans, s. peas and s. lupins: Weedkillers: Paraquat at 0.40 kg ion in 220 l. Insecticides: Cypermethrin at 0.025 kg in 220 l applied twice, pirimicarb at 0.14 kg in 220 l. Fungicide: Benomyl at 0.55 kg applied with the pirimicarb.
S. beans and s. peas: Weedkillers: Trietazine at 1.2 kg with simazine 0.17 kg in 220 l.
S. lupins: Weedkillers: Paraquat at 0.33 kg ion with monolinuron at 0.46 kg in 220 l. Metamitron at 2.8 kg in 220 l.
Sunflowers: Manures: N at 70 kg as 'Nitro-Chalk'. Weedkillers: Paraquat at 0.40 kg ion in 220 l. Trifluralin at 1.1 kg in 220 l. Linuron at 0.50 kg in 220 l.
W. beans: Weedkiller: Paraquat at 0.40 kg ion in 220 l. Trietazine at 1.2 kg with simazine at 0.17 kg in 220 l. Insecticide: Cypermethrin at 0.025 kg in 220 l applied twice.
Fallow plots only: Paraquat at 0.40 kg ion in 220 l.

Seed: W. oats: Bulwark, sown at 180 kg.
W. rape: Ariana, sown at 8 kg.
W. peas: Frijaune, sown at 220 kg.
W. wheat: Avalon, sown at 200 kg.
S. beans: Minden, sown at 280 kg.
S. lupins: Vladimir, sown at 220 kg.
S. peas: Progreta, sown at 220 kg.
Sunflowers: Asmer 9, sown at 10 kg.

Cultivations, etc.:-
All plots: Shallow rotary cultivated: 19 Aug, 1986. K applied: 20 Aug. Ploughed, furrow pressed: 22 Aug.
W. oats: Spring-tine cultivated, seed sown, rolled, terbutryne and paraquat applied: 6 Oct, 1986. N applied: 8 Apr, 1987. Cyanazine, clopyralid, mecoprop, prochloraz and carbendazim applied: 16 Apr. Combine harvested: 10 Sept.
W. rape: Seed sown: 27 Aug. Fluazifop-butyl applied: 3 Oct. Deltamethrin applied: 14 Oct and 20 Nov. Propyzamide and clopyralid applied: 29 Oct and 6 Jan, 1987. Prochloraz applied: 17 Nov, 1986. N applied: 20 Feb, 1987. Diquat applied: 10 Aug. Combine harvested: 17 Aug.
W. peas: Spring-tine cultivated: 6 Oct, 1986. Paraquat applied: 29 Oct. Seed sown: 12 Nov. Trietazine and simazine applied: 18 Nov. Cypermethrin applied: 8 May, 1987 and 11 June. Pirimicarb and benomyl applied: 13 July. Diquat applied: 10 Aug. Combine harvested: 18 Aug.
W. wheat: Power harrowed, seed sown, rolled: 23 Sept, 1986. Terbutryne and paraquat applied: 24 Sept. Isoproturon and mecoprop applied: 29 Oct. N applied: 8 Apr, 1987. Cyanazine, clopyralid, mecoprop, prochloraz and carbendazim applied: 16 Apr. Combine harvested: 1 Sept.
S. beans and s. peas: Spring-tine cultivated: 6 Oct, 1986. Paraquat applied: 29 Oct. Seed sown: 18 Mar, 1987. Trietazine and simazine applied: 19 Mar. Cypermethrin applied: 8 May and 11 June. Benomyl and pirimicarb applied: 13 July. Combine harvested: S. beans 11 Sept, s. peas 14 Sept.
S. lupins: Spring-tine cultivated: 6 Oct, 1986. Paraquat applied: 29 Oct. Rotary cultivated, seed sown, rolled, monolinuron and paraquat applied: 16 Apr, 1987. Cypermethrin applied: 8 May and 11 June. Metamitron applied: 18 June. Benomyl and pirimicarb applied: 13 July. Combine harvested: 17 Nov.

https://doi.org/10.23637/ERADOC-1-37 *pp 3*

87/R/CS/324

Cultivations cont'd, etc.:-
Sunflowers: Spring-tine cultivated: 6 Oct, 1986. Paraquat applied: 29 Oct. N applied, trifluralin applied, spring-tine cultivated twice and seed sown: 30 Apr, 1987. Rolled: 5 May. Linuron applied: 6 May. Harvested by hand and one plot stationary combine harvested: 28 Oct.
W. beans, later fallowed: Spring-tine cultivated: 6 Oct, 1986. Paraquat applied: 29 Oct. Seed sown: 4 Dec. Trietazine and simazine applied: 10 Dec. Cypermethrin applied: 8 May, 1987 and 11 June. Spring-tine cultivated, rotary cultivated: 29 June.
Fallow: Spring-tine cultivated: 6 Oct, 1986. Paraquat applied: 29 Oct. Spring-tine cultivated, rotary cultivated: 29 June, 1987. Previous crops: Potatoes 1985, s. barley 1986.

NOTE: Two sunflower plot yields were lost because of bird damage. Estimated values were used in the analysis.

VARIOUS CROPS

GRAIN TONNES/HECTARE

***** Tables of means *****

CROP	
W OATS	4.31
W RAPE	2.12
W PEAS	1.29
W WHEAT	7.35
S BEANS	5.22
S LUPINS	0.93
S PEAS	2.73
SNFLOWER	0.91
Mean	3.11

*** Standard errors of differences of means ***

Table	CROP
s.e.d.	0.507

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.621	20.0

GRAIN MEAN DM% 77.1

SUB PLOT AREA HARVESTED
W. OATS, W. RAPE, W. WHEAT 0.00124
W. PEAS, S. BEANS, S. LUPINS, S.PEAS, SNFLOWER 0.00115

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