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Winter Oilseed Rape

Rothamsted Research

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84/R/RA/2

WINTER OILSEED RAPE

UREA AND INHIBITORS

Object: To study the effects of adding nitrification inhibitors to prilled urea, applied to the seedbed and in spring on the yield and nitrogen uptake of w. oilseed rape - Whittlocks.

Sponsors: G.A. Rodgers, A. Penny, M.V. Hewitt.

Design: 2 randomised blocks of 17 plots.

Whole plot dimensions: 4.0 x 20.0.

Treatments: All combinations of:-

1. N INHIB Forms of nitrogen and nitrification inhibitor used for seedbed and spring nitrogen applications:

AN 0	Ammonium nitrate (as 'Nitro-Chalk'), no inhibitor
PU 0	Prilled urea, no inhibitor
PU DIC	Prilled urea and dicyandiamide
PU HYD	Prilled urea and hydroquinone

2. SEEDBD N Nitrogen rates (kg N) to seedbed (on 22 August, 1983):

0	
50	

3. SPRING N Nitrogen rates (kg N) and times in spring:

75E+75L	75 on 10 Feb and 75 on 21 Mar, 1984.
150M	150 on 5 Mar.

plus one extra treatment:

EXTRA

NONE No nitrogen fertilizer or inhibitor

NOTE: Dicyandiamide and hydroquinone were applied at 25 and 10 kg respectively in combination with SEEDBD N 0 and at 33 kg and 13 kg with SEEDBED N 50.

Basal applications: Weedkillers: TCA at 11 kg in 250 l. Propyzamide and 3, 6-dichloropicolinic acid (as 'Matrikerb' at 1.6 kg) in 500 l. Fungicide: Prochloraz at 0.50 kg in 250 l. Desiccant: Diquat at 0.6 kg ion with 'Agral', a wetting agent at 0.5 l, in 500 l.

Seed: Jet Neuf, dressed gamma HCH, thiram, fenpropimorph and iprodione, sown at 9.0 kg.

Cultivations, etc.: - Disced: 17 Aug, 1983. TCA applied: 23 Aug. Spring-tine cultivated: 24 Aug. Seed direct drilled: 25 Aug. 'Matrikerb' applied: 25 Oct. Fungicide applied: 18 Apr, 1984. Desiccant applied: 25 July. Combine harvested: 30 July. Previous crops: W. wheat 1982, w. barley 1983.

84/R/RA/2

- NOTES: (1) Dry matter and N contents of plants were measured in February, May and June
 (2) S contents of leaves were measured in May.
 (3) Oil and protein contents of grain were measured.

GRAIN (AT 90% DM) TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDBD N	0	50	MEAN	
N INHIB				
AN O	3.10	3.16	3.13	
PU O	2.87	2.83	2.85	
PU DIC	2.65	2.86	2.76	
PU HYD	3.09	3.04	3.07	
MEAN	2.93	2.97	2.95	
SPRING N	75E+75L	150M	MEAN	
N INHIB				
AN O	3.06	3.21	3.13	
PU O	2.92	2.78	2.85	
PU DIC	2.79	2.72	2.76	
PU HYD	3.06	3.08	3.07	
MEAN	2.96	2.95	2.95	
SPRING N	75E+75L	150M	MEAN	
SEEDBD N				
0	3.01	2.85	2.93	
50	2.90	3.04	2.97	
MEAN	2.96	2.95	2.95	
SEEDBD N	0	50		
SPRING N	75E+75L	150M	75E+75L	150M
N INHIB				
AN O	3.13	3.08	2.98	3.35
PU O	3.00	2.74	2.83	2.82
PU DIC	2.71	2.59	2.87	2.85
PU HYD	3.18	3.01	2.94	3.14
NONE	1.33			
GRAND MEAN	2.86			

84/R/RA/2

GRAIN (AT 90% DM) TONNES/HECTARE

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

TABLE	N INHIB	SEEDBD N	SPRING N	N INHIB SEEDBD N
SED	0.089	0.063	0.063	0.126
TABLE	N INHIB SPRING N	SEEDBD N SPRING N	N INHIB SEEDBD N SPRING N & NONE	
SED	0.126	0.089	0.179	

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

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.179	6.3

GRAIN MEAN DM% 87.6

PLOT AREA HARVESTED 0.00465

84/R/RA/6

WINTER OILSEED RAPE

SPRING NITROGEN INHIBITORS

Object: To study the effects of adding nitrification inhibitors to prilled urea, applied in spring, on the yield and nitrogen uptake of w. oilseed rape - Whittlocks.

Sponsors: G.A. Rodgers, A. Penny, M.V.Hewitt.

Design: 2 randomised blocks of 9 plots.

Whole plot dimensions: 4.0 x 20.0.

Treatments: All combinations of:-

1. N INHIB Forms of nitrogen and nitrification inhibitors:
 - AN O Ammonium nitrate (as 'Nitro-Chalk'), no inhibitor
 - PU O Prilled urea, no inhibitor
 - PU DIC Prilled urea and dicyandiamide at 33 kg
 - PU HYD Prilled urea and hydroquinone at 13 kg

2. SPRING N Nitrogen rates (kg N) and times:
 - 75E+75L 75 on 10 Feb and 75 on 21 Mar, 1984
 - 150M 150 on 5 Mar

plus one extra treatment

EXTRA

NONE No spring nitrogen fertilizer or inhibitor

Basal applications: Manures: 'Nitro-Chalk' at 220 kg. Weedkillers: TCA at 11 kg in 250 l. Propyzamide with 3, 6-dichloropicolinic acid (as 'Matrikerb' at 1.6 kg) in 500 l. Fungicide: Prochloraz at 0.50 kg in 250 l. Desiccant: Diquat at 0.6 kg ion with 'Agral', a wetting agent, at 0.5 l, in 500 l.

Seed: Jet Neuf, dressed thiram, fenpropimorph and iprodione, sown at 9.0 kg.

Cultivations, etc.: - Discd: 17 Aug, 1983. N applied: 22 Aug. TCA applied: 23 Aug. Spring-tine cultivated: 24 Aug. Seed direct drilled: 25 Aug. 'Matrikerb' applied: 25 Oct. Fungicide applied: 18 Apr, 1984. Desiccant applied: 25 July. Combine harvested: 30 July. Previous crops: W. wheat 1982, w. barley 1983.

- NOTES: 1) Ammonia volatilisation was measured after application of N dressings.
2) Soil samples were taken from February to June for N analyses.
3) Oil and protein contents of grain were measured.

84/R/RA/6

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** TABLES OF MEANS *****

SPRING N N INHIB	75E+75L	150M	MEAN
AN 0	3.09	3.41	3.25
PU 0	3.17	3.11	3.14
PU DIC	2.96	3.16	3.06
PU HYD	3.33	3.29	3.31
MEAN	3.14	3.24	3.19

NONE 1.77

GRAND MEAN 3.03

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

TABLE	N INHIB	SPRING N	N INHIB SPRING N & NONE
-----	-----	-----	-----
SED	0.109	0.077	0.155

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

STRATUM	DF	SE	CV%
BLOCK.WP	8	0.155	5.1

GRAIN MEAN DM% 88.9

PLOT AREA HARVESTED 0.00465

84/R/RA/7

WINTER OILSEED RAPE

METHODS OF APPLYING GROWTH REGULATOR

Object: To compare electrostatic and conventional spray application of a growth regulator and to study effects on plant growth, diseases and yield of w. oilseed rape - Whittlocks.

Sponsors: C.J. Rawlinson, G.R. Cayley.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments: All combinations of:-

1. METHOD Methods of applying the growth regulator, triapenthenol:
 CNVNTIAL Conventional hydraulic sprayer in 200 l on 19 Mar, 1984.
 ELECTROS Electrostatic sprayer in 9.3 l on 19 Mar.
2. RATE Rates of triapenthenol (kg):
 0.35
 0.70

plus one extra treatment:

EXTRA

NONE

Basal applications: Manures: 'Nitro-Chalk' at 220 kg on the first occasion, and at 460 kg on the second and third occasions. Weedkillers: TCA at 11 kg in 250 l. Propyzamide and 3, 6-dichloropicolinic acid (as 'Matrikerb' at 1.63 kg) in 500 l. Desiccant: Diquat at 0.60 kg ion with 'Agral', a wetting agent at 0.5 l, in 500 l.

Seed: Jet Neuf, seed dressed gamma HCH, thiram, fenpropimorph and iprodione, seed sown at 9 kg.

Cultivations, etc.:- Discd: 17 Aug, 1983. N applied: 22 Aug. TCA applied: 23 Aug. Spring-tine cultivated: 24 Aug. Seed direct drilled: 25 Aug. 'Matrikerb' applied: 25 Oct. N applied: 15 Feb, 1984. N applied: 5 Apr. Desiccant applied: 25 July. Combine harvested: 1 Aug. Previous crops: W. wheat 1982, w. barley 1983.

NOTE: Disease incidence and severity was assessed on seven occasions between March and July. Cuticular wax on leaves was measured on all plots in April. Plant height, internode length and branch number and length, were measured in July.

84/R/RA/7

GRAIN (90% DM) TONNES/HECTARE

***** TABLES OF MEANS *****

	RATE	0.35	0.70	MEAN
	METHOD			
	CNVNTIAL	3.47	3.76	3.62
	ELECTROS	3.66	3.58	3.62
	MEAN	3.57	3.67	3.62
NONE		3.44		
GRAND MEAN		3.58		

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

TABLE	METHOD	RATE	METHOD RATE & NONE
-----	-----	-----	-----
SED	0.130	0.130	0.183

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

STRATUM	DF	SE	CV%
BLOCK.WP	12	0.259	7.2

GRAIN MEAN DM% 89.5

PLOT AREA HARVESTED 0.00229

84/R/RA/8

WINTER OILSEED RAPE

MUSTARD OIL

Object: To study the effects of carbendazim, prochloraz and a synthetic mustard oil formulation on fungal diseases and yield of w. oilseed rape - Whittlocks.

Sponsors: C.J. Rawlinson, G.R. Cayley, J.A. Pickett.

Design: 8 randomised blocks of 4 plots.

Whole plot dimensions: 2.0 x 6.0.

Treatments:

FUNGCIDE	Fungicides:
NONE	None
MSTD OIL	Mustard oil at 0.25 kg
PROCHLOR	Prochloraz at 0.40 kg
PROC+CAR	Prochloraz at 0.40 kg plus carbendazim at 0.15 kg

NOTES: (1) Treatment sprays were applied to four blocks on 4 Apr, 1984 to the other four on 13 Apr.
(2) Treatments were applied by electrostatic sprayer in 9.3 l water.

Basal applications: Manures: 'Nitro-Chalk' at 220 kg on the first occasion, and at 460 kg on the second and third occasions. Weedkillers: TCA at 11 kg in 250 l. Propyzamide and 3, 6-dichloropicolinic acid (as 'Matrikerb' at 1.63 kg) in 500 l. Desiccant: Diquat at 0.60 kg ion with 'Agral', a wetting agent, at 0.5 l, in 500 l.

Seed: Jet Neuf, seed dressed gamma HCH, thiram, fenpropimorph and iprodione, sown at 9 kg.

Cultivations, etc.: - Discd: 17 Aug, 1983. N applied: 22 Aug. TCA applied: 23 Aug. Spring-tine cultivated: 24 Aug. Seed direct drilled: 25 Aug. 'Matrikerb' applied: 25 Oct. N applied: 15 Feb, 1984. N applied: 5 Apr. Desiccant applied: 25 July. Combine harvested: 31 July. Previous crops: W. wheat 1982, w. barley 1983.

NOTE: Disease incidence and severity, to all parts of the plant, was assessed fortnightly from April to July.

84/R/RA/8

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** TABLES OF MEANS *****

FUNGCIDE	NONE	MSTD OIL	PROCHLOR	PROC+CAR	MEAN
	4.56	4.63	4.59	4.65	4.61

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

TABLE	FUNGCIDE
-----	-----
SED	0.161

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

STRATUM	DF	SE	CV%
BLOCK.WP	21	0.321	7.0

GRAIN MEAN DM% 83.7

PLOT AREA HARVESTED 0.00120