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78/R/WS/1 Bacterial Inoculation - S. Wheat

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78/R/WS/1

SPRING WHEAT

BACTERIAL INOCULATION

Object: To study the effects of applying a bacterial inoculant and additives on the growth and yield of spring wheat in the presence and absence of straw applied in winter - Hoosfield.

Sponsors: M.E. Brown, J.F. Witty.

Design: Single replicate of 2 x 3 split into 2 x 4.

Whole plot dimensions: 4.27 x 7.62.

Treatments: All combinations of:-

Whole plots

1. STRAW Straw (t) applied in winter, chopped on site and ploughed in on 14 Dec, 1977:

0.0
7.5

2. SEEDBD N Nitrogen fertiliser (kg N) (as 'Nitro-chalk 26') applied to seedbed on 17 May, 1978:

30
90
150

Sub plots

3. WINTER N Nitrogen fertiliser (kg N) (as 'Nitro-chalk 25') applied just before straw on 13 Dec, 1977:

0
30

4. INOCULNT Inoculants sprayed on chopped straw:

0 None
B+W+C Bacterial inoculant plus fermented whey plus cobalt lactate
W+C Fermented whey plus cobalt lactate
C Cobalt lactate

NOTE: Rates of application of INOCULNT were:

- (1) Bacteria at 0.019 kg of a culture containing *Actinomyces thermophilus*, *Azotobacter chroococcum*, *Cellvibrio*, *Cytophaga* and *Bacillus subtilis*.
 - (2) Whey 6.67 kg.
 - (3) Cobalt lactate (0.22 kg 'Symbooster').
- Materials were applied in 240 l.

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Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l) in 220 l.

Seed: Sicco, sown at 190 kg.

Cultivations, etc.:— Ploughed: 16 Dec, 1977. Rotary harrowed, seed sown: 15 Mar, 1978. Weedkillers applied: 26 May. Combine harvested: 16 Sept. Previous crops: Sugar beet 1976, barley 1977.

NOTE: Germination counts were made in May and the total dry weight of plants was measured in May and June.

GRAIN TONNES/HECTARE

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

SEEDBD N	30	90	150	MEAN
STRAW				
0.0	2.30	2.98	3.85	3.04
7.5	1.60	2.22	3.07	2.29
MEAN	1.95	2.60	3.46	2.67
WINTER N	0	30	MEAN	
STRAW				
0.0	2.80	3.29	3.04	
7.5	2.10	2.49	2.29	
MEAN	2.45	2.89	2.67	
WINTER N	0	30	MEAN	
SEEDBD N				
30	1.80	2.10	1.95	
90	2.34	2.85	2.60	
150	3.21	3.71	3.46	
MEAN	2.45	2.89	2.67	

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GRAIN TONNES/HECTARE

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

INOCULNT STRAW	0	B+W+C	W+C	C	MEAN
0.0	3.09	3.01	2.95	3.12	3.04
7.5	2.39	2.37	2.24	2.17	2.29
MEAN	2.74	2.69	2.59	2.65	2.67

INOCULNT SEEDBD N	0	B+W+C	W+C	C	MEAN
30	1.99	1.99	1.99	1.82	1.95
90	2.81	2.48	2.51	2.59	2.60
150	3.43	3.61	3.26	3.53	3.46
MEAN	2.74	2.69	2.59	2.65	2.67

INOCULNT WINTER N	0	B+W+C	W+C	C	MEAN
0	2.61	2.51	2.27	2.41	2.45
30	2.87	2.88	2.92	2.89	2.89
MEAN	2.74	2.69	2.59	2.65	2.67

STRAW	WINTER N SEEDBD N	0	30
0.0	30	2.07	2.53
	90	2.76	3.20
	150	3.57	4.12
7.5	30	1.52	1.67
	90	1.93	2.50
	150	2.84	3.30

STRAW	INOCULNT SEEDBD N	0	B+W+C	W+C	C
0.0	30	2.19	2.45	2.24	2.32
	90	3.23	2.77	2.81	3.11
	150	3.86	3.82	3.79	3.93
7.5	30	1.79	1.53	1.75	1.31
	90	2.39	2.20	2.22	2.06
	150	3.00	3.40	2.74	3.13

STRAW	INOCULNT WINTER N	0	B+W+C	W+C	C
0.0	0	2.82	2.84	2.56	2.99
	30	3.36	3.19	3.33	3.26
7.5	0	2.41	2.18	1.97	1.83
	30	2.38	2.57	2.50	2.51

SEEDBD N	INOCULNT WINTER N	0	B+W+C	W+C	C
30	0	2.03	1.94	1.49	1.71
	30	1.95	2.04	2.50	1.92
90	0	2.60	2.07	2.33	2.37
	30	3.01	2.90	2.70	2.81
150	0	3.20	3.51	2.98	3.13
	30	3.66	3.71	3.55	3.93

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GRAIN TONNES/HECTARE

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

TABLE	STRAW	SEEDBD N	WINTER N	INOCULNT
SED	**	**	0.089	0.126

TABLE	STRAW SEEDBD N	STRAW* WINTER N	SEEDBD N* WINTER N	STRAW* INOCULNT
SED	**	0.126	0.154	0.178

TABLE	SEEDBD N* INOCULNT	WINTER N INOCULNT	STRAW* SEEDBD N WINTER N	STRAW* SEEDBD N INOCULNT
	0.218	0.178	0.218	0.308

TABLE	STRAW* WINTER N INOCULNT	SEEDBD N* WINTER N INOCULNT
SED	0.251	0.308

* WITHIN SAME LEVEL OF STRAW, SEEDBD N OR STRAW SEEDBD N

** NO STANDARD ERROR AVAILABLE

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

STRATUM	DF	SE	CV%
WP.SP	6	0.308	11.5

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00217