

Summary

Lasko triticale outyielded winter wheat in the absence of disease control, even at low levels of nitrogen application. However, with the use of fungicides winter wheat was able to outyield triticale. Grain yields of triticale were increased by the use of Cycocel growth regulator. The growth regulators increased tiller production and had a shortening effect on straw length.

The highest mean yield of triticale was 7.25 t/ha from an application of 180 kg/ha N and with Cycocel applied. Norman winter wheat yielded 7.92 t/ha at 220 kg/ha N. A full programme of disease control was used in both cases.

Object

To investigate nitrogen rate, fungicide use and different growth regulator treatments on triticale in comparison with the performance of winter wheat on sandy loam over chalky boulder clay.

Treatments and Method

1. Disease control

- a. Nil
- b. Hispor 0.5 kg/ha at GS 31 (first node)
- Tilt 0.5 kg/ha at GS 37 (flag leaf emergence)
- Bayleton CF 2.0 kg/ha at GS 58 (ear emergence)

2. Nitrogen level (kg/ha)

- a. 100
- b. 140
- c. 180
- d. 220
- e. 180 - winter wheat
- f. 220 - winter wheat

3. Growth regulator (on triticale only)

- a. Nil
- b. Cycocel 5C (chlormequat)
- c. Terpal (mepiquat chloride)
- d. Cycocel 5C + Terpal

A randomised block with two replications was used.

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Results

Yield of Grain (t/ha at 85% dm)

a) Triticale

Disease control	Nitrogen level kg/ha	Growth Regulator				Mean
		Nil	<u>Cycocel</u>	<u>Terpal</u>	<u>Cycocel + Terpal</u>	
	ESE		(+0.153 VI)	(+0.117H)		(+0.113)
Nil	100	5.53	6.19	5.37	5.89	5.74
	140	6.18	6.57	6.03	6.40	6.29
	180	6.69	7.00	6.53	6.60	6.71
	220	6.55	6.94	6.73	6.49	6.68
Full Programme	100	5.47	6.13	5.50	5.97	5.77
	140	6.22	6.67	6.23	6.59	6.43
	180	6.31	7.25	6.71	6.80	6.77
	220	6.96	7.06	7.20	7.20	7.10
Mean		6.24	6.73	6.29	6.49	6.44

b) Winter Wheat

Nitrogen	Disease control	
	Nil	Full
	(+0.105)	
180	5.85	7.79
220	5.90	7.92
Mean	(+0.076)	
	5.88	7.85

In the absence of disease control, winter wheat was severely affected by disease, notably mildew and Septoria, resulting in grain yields much lower than those of triticale. There was no significant overall increase in the mean yield of triticale from the use of fungicides. Fungicides significantly increased the yield of wheat to above that of triticale.

Yields of triticale increased with each increase of nitrogen up to 220 kg/ha, with disease control, but declined at the highest nitrogen application where no fungicides were used.

The growth regulator Cycocel gave an increase in grain yields of triticale, but Terpal had no overall effect. Where Cycocel and Terpal were used in sequence, a yield increase mid-way between those given by the chemicals used singly occurred.

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APPENDIX - NAS 356 ML 1984

Winter triticale - nitrogen and growth regulator 1984

Diary

22 October 1983 Winter triticale and winter wheat drilled at 165 kg/ha
 23 November Mofix 500L applied at 1.7 l/ha
 9 March 1984 50 kg/ha nitrogen applied overall
 2 May Balance of nitrogen applied by hand
 3 May Hispor sprayed at 0.5 kg/ha (GS 30-31)
 3 May Cycocel applied at 2.5 l/ha (GS 30-31)
 25 May Terpal applied at 2.0 l/ha (GS 37)
 31 May Tilt sprayed at 0.5 l/ha
 29 June Bayleton CF sprayed at 2.0 kg/ha
 3 September Harvest

Triticale - Effect of nitrogen on ears/m², green leaf and grain quality

Nitrogen Level kg/ha	Total Ears/m ²		% Green Leaf
	(±14.425)		(±3.125)
100	488.5		17.8
140	550.7		34.7
180	586.4		48.3
220	614.3		56.1
	1000 Gw	Specific Weight	% Nitrogen at 85% dm
	(±0.26)	(±0.128)	(±0.017)
100	43.5	73.74	1.58
140	42.6	73.15	1.70
180	42.0	72.88	1.78
220	41.1	72.48	1.86

Nitrogen increased the number of ears/m² and improved green leaf survival. Grain nitrogen was also increased with each increment of applied nitrogen. Thousand grain weight and grain specific weight was reduced progressively as nitrogen rate was increased.

Triticale - Effect of growth regulators on ears/m², straw length and grain quality

Growth regulators	Ears/m ² on primary tillers	Ears/m ² on secondary tillers		Total ears/m ²
	(+13.577)	(4.646)		(+14.425)
Nil	447.7	21.9		469.6
<u>Cycocel</u>	465.5	75.6		541.1
<u>Terpal</u>	514.9	94.7		609.6
<u>Cycocel</u> + <u>Terpal</u>	522.8	96.8		619.6
	1000 GW	Specific weight	% Nitrogen at 85% dm	Straw Length cms main tillers
	(+0.26)	(+0.128)	(+0.017)	(+1.08)
Nil	44.3	73.33	1.80	114.5
<u>Cycocel</u>	42.5	73.33	1.70	101.0
<u>Terpal</u>	42.2	73.23	1.72	96.1
<u>Cycocel</u> + <u>Terpal</u>	40.2	72.36	1.71	86.9

Growth regulators increased the number of primary tillers and the growth of fertile secondary tillers. Terpal had a greater effect than Cycocel in this respect. Thousand grain weight, nitrogen per cent and straw length were reduced with all growth regulator treatments particularly so when both Cycocel and Terpal was used. These two also lowered the grain specific weight.