CERETECH

THE EVALUATION OF

NITROMAX

ON WINTER WHEAT

January 7, 1997

Objective

NITROMAX is believed to have growth stimulatory properties when applied to crops. In conjunction with a soil conditioner treatment, NITROMAX was applied to winter wheat crops in autumn and spring and the influence on crop performance was monitored.

TRIAL DETAILS

It was not possible to evaluate all of the required treatments at the same location and so a trials matrix was produced that covered up to 4 treatments at 3 locations.

The trials were located at three ARC Centres.

Caythorpe	- Lincolnshire
Cirencester	- Gloucestershire
Wye	- Kent

and the trial protocol at each Centre was therefore slightly different.

Untreated	Caythorpe	Cirencester	Wye
NITROMAX + Soil Conditioner (Aut)	Caythorpe	Cirencester	-
NITROMAX + Soil Conditioner (Spring)	Caythorpe	Cirencester	Wye
NITROMAX + Soil Conditioner (Aut + Spring)	Caythorpe	Cirencester	Wye

The rates of application, at each treatment timing were.

NITROMAX	0.93 l/ha
Soil Conditioner	0.02 l/ha

All trial plots were drilled 12m long and 14 rows wide, and each treatment was replicated three times.

Agronomic inputs were routine, and are presented in the Appendix.

The key application timings at each of the three locations were

	Caythorpe	Cirencester	Wye
Autumn	20 November	13 November	2 November
Spring	25 April	11 April	11 April

RESULTS

CAYTHORPE

The NITROMAX and soil conditioner application were made at this location when the crop, Winter Wheat- RIBAND, was at GS22 and GS30.

No visual symptoms were noted in the crop following either of the applications.

The plots were harvested on August 17th and gave the following yields.

Treatment	Yield (t/ha)	% of Untreated	Ears/m^2
Untreated	7.23	100	486
NITROMAX + Soil Conditioner (Aut)	7.42	102.6	442
NITROMAX + Soil Conditioner (Spring)	7.67	106.1	467
NITROMAX + Soil Conditioner (Aut + Spr)	7.50	103.7	478

CV 4.45%
LSD 0.46 t/ha

All of the applications of NITROMAX increased yield, but none of the responses were statistically significant. The spring application of NITROMAX plus soil conditioner was the best of the three treatments, and was only 0.01 t/ha short of being a significant yield response.

The grain from the plots was sent to an independent laboratory for analysis, and produced the following results.

Treatment	Spec Wt. kg/ha	TGW (gms)	% Protein	Hagberg Falling Number
Untreated	75.8	52	8.70	248
NITROMAX +SC (Aut)	77.8	54	8.70	213
NITROMAX + SC (Spr)	77.2	53	9.30	253
NITROMAX + SC (Aut + Spr)	77.8	55	9.10	261

These are a very interesting set of results, as there appears to be consistency with the application of NITROMAX.

- all applications of NITROMAX improved the specific weight of the harvested grains over those of the untreated.
- the applications of NITROMAX in spring improved grain protein contents considerably.

CIRENCESTER

The variety of winter wheat at this location was HARRIER.

NITROMAX applications were made at GS12 and GS30. No visual effects were noted after any of the treatments.

The plots were harvested on August 16th and gave the following yields.

Treatment	Yield (t/ha)	% of Untreated
Untreated	7.90	100
NITROMAX + SC (Aut)	7.68	97.2
NITROMAX + SC (spring)	7.75	94.9
NITROMAX + SC (Aut + Spr)	7.90	100

CV 4.02%
LSD 0.71 t/ha

The trial produced no significant differences in yield, but two of the treatments did show small levels of yield depression associated with NITROMAX applications.

The quality analysis of the harvested grain samples gave the following results.

Treatment	Spec Wt (kg/hl)	TGW (gms)	% Protein	Hagberg Falling Number
Untreated	75.5	37.8	10.24	338
NITROMAX + SC (Aut)	73.3	38.6	9.36	315
NITROMAX + SC (Spring)	74.3	44.8	10.29	356
NITROMAX + SC (Aut + Spr)	74.4	42.8	9.07	308

The grain protein content figures were very varied, but where autumn applications were made, the protein contents appeared to be lower.

WYE

The applications were made at GS21 and GS30 to the crop of winter wheat - RIBAND.

This trial only had two treatments to compare to the untreated control, and none of the treatments created any visual symptoms after application.

The plots were harvested on August 16th and gave the following yields.

Treatment	Yield (t/ha)	% of Untreated	Ears/m^2
Untreated	10.92	100	525
NITROMAX + SC (Aut + Spring)	10.80	98.9	526
NITROMAX + SC (Spring)	10.49	96.1	531

CV 2.36%
LSD 0.57 t/ha

Once again the trial produced no significant yield differences between treatments, but the two NITROMAX treatments were fractionally lower yielding than the untreated.

The grain analysis results were

Treatment	Spec Wt (kg/hl)	TGW (gms)	% Protein	Hagberg Falling Number
Untreated	76.9	56.8	9.4	239
NITROMAX + SC (Aut + Spr)	75.1	56.4	8.4	277
NITROMAX + SC (Spring)	76.9	56.5	10.1	282

Both NITROMAX treatments did appear to give higher Hagberg Falling Number readings, which in a difficult harvest season could be an advantage.

However the interesting treatment was the % grain protein content. The responses to NITROMAX application were large, but in both directions. The autumn application appeared to depress protein content, whereas the spring application increased it.

The results from these three trials do not show complete consistency, but there are some useful indications of responses, and perhaps some scope for further investigation.

The only location that exhibited a yield response (although it was not significant) to NITROMAX application, was the Caythorpe location which was the lowest yielding of the three locations.

This may suggest that products of this type may be more suited to situations where the crop is under fertility pressure, and that in high yield potential situations, growth enhancement may not be relevant.

It may therefore be useful either to concentrate effort into lower yield potential locations, or look at NITROMAX as a possible Nitrogen substitution in a wider range of fertility options.

Spring applications of NITROMAX were also associated with improvements in grain protein content, and if this could be established as a consistent response, it would have significant potential.

BANNEALL (MM)
COTSWOLD
MM
0
10
20
30
40
01.09.95
10.09.95
20.09.95
30.09.95
10.10.95
20.10.95
30.10.95
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20.11.95
30.11.95
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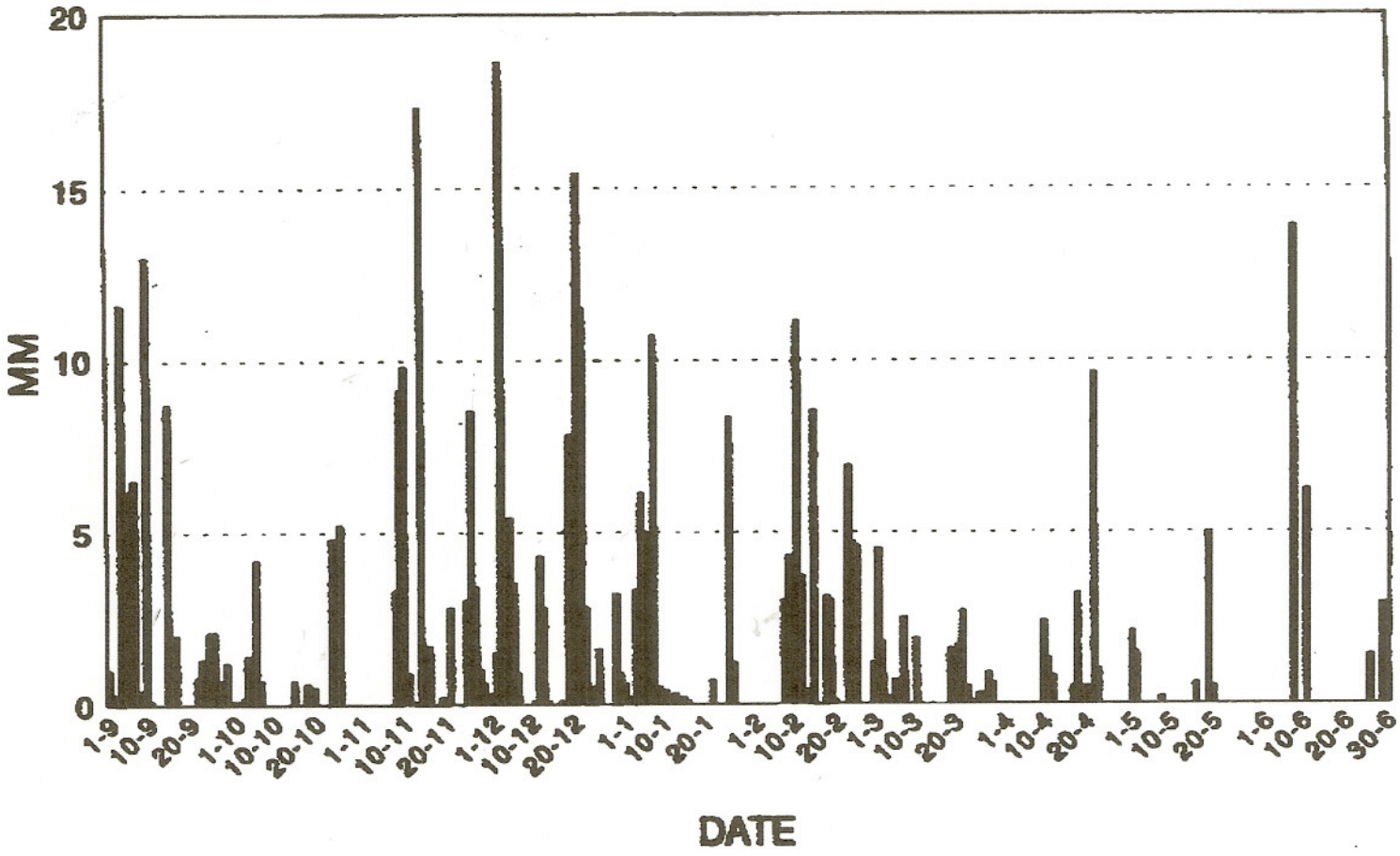
20.06.96
30.06.96

ARC 1995-6

RAINFALL MM
CAYTHORPE, LINCS



ARC 1996

APPENDIX

Crop	: Winter wheat		
Location	: CIRENCESTER		
Soil Type	:343 d SHERBORNE		
Soil Analysis	- 16, K - 212, N - , Mg - 48, Mn - , Su - 19		
Previous Crop	: Winter Oil seed rape		
Drilled	: / /		
Variety	: HARRIER		
Seed Rate	: 400 seeds/m2		
Fertiliser	:N AN 34.5%	50.00 kg/ha	06/03/96
	:N AN 34.5%	150.00 kg/ha	26/04/96
Fungicide	: HALO	1.33 l/ha	30/04/96
	: EPIC	0.75 l/ha	04/06/96
	BRAVO 500	1.00 l/ha	04/06/96
	:PATROL	0.25 l/ha	04/06/96
Herbicide	PANTHER	2.00 l/ha	18/12/95
	: ALLY	0.03 kg/ha	10/04/96
	STARANE 2	0.50 l/ha	06/06/96
Insecticide	SUMI ALPHA	0.16 l/ha	08/11/96
Harvest Date	: / /		

APPENDIX

Crop	:	Winter wheat		
Location	:	WYE		
Soil Type	:	BRICK EARTH		
Soil Analysis	:	P - 38, K - 326, N - , Mg - 55, Mn - 542, Su - 7		
Previous Crop	:	Peas		
Drilled	:	29/09/95		
Variety	:	RIBAND B		
Seed Rate	:	350 seeds/m2		
Fertiliser	:N AN 34.5%	40.00 kg/ha	25/03/96	
	:N AN 34.5%	100.00 kg/ha	16/04/96	
Fungicide	: GENIE	0.20 l/ha	25/04/96	
	:TERN 750 EC	0.25 l/ha	25/04/96	
	BRAVO 500	0.50 l/ha	25/04/96	
	:TERN 750 EC	0.50 l/ha	30/05/96	
	: OPUS	0.75 l/ha	30/05/96	
	: LEGION	2.50 l/ha	20/06/96	
Growth Regulator	:	BREVIS	2.25 l/ha	29/03/96
	: TERPAL	1.00 l/ha	15/05/96	
Herbicide	: IPU	3.30 l/ha	31/10/95	
	CMPP RACEMIC	2.50 l/ha	31/10/95	
	: JAVELIN	1.60 l/ha	31/10/95	
	: ALLY	0.03 kg/ha	30/05/96	
	STARANE 2	0.60 l/ha	30/05/96	
Insecticide	: DECIS	0.20 l/ha	31/10/95	
Wetter	: AGRAL	0.20 l/ha	15/05/96	
Harvest Date	:	16/08/96		

APPENDIX

Crop	:	Winter wheat		
Location	:	CAYTHORPE		
Soil Type	:	ELMTON 1		
Soil Analysis	:	P - 29, K - 250, N - , Mg - 70, Mn - , Su -		
Previous Crop	:	Spring Barley		
Drilled	:	29/09/95		
Variety	:	RIBAND		
Seed Rate	:	400 seeds/m2		
Fertiliser	:	N AN 34.5%	40.00 kg/ha	15/03/96
Fungicide	:	TERN 750 EC	0.30 l/ha	07/05/96
	:	TILT 250 EC	0.50 l/ha	07/05/96
	:	TERN 750 EC	0.50 l/ha	03/06/96
	:	EPIC	0.75 l/ha	03/06/96
Herbicide	:	PANTHER	2.00 l/ha	15/11/95
Insecticide	:	TOPPELL	0.25 l/ha	21/10/95
Harvest Date	:	17/08/96		