SUGAR BEET

SUGAR BEET SEED PRIMING NAS 511 0 77

In addition to the seed priming trial at Morley a simplified version of the trial was carried out at Larling using the four varieties Bush Mono G, Anono, Nono and Sharpe's Klein Monobeet. The treatments consisted of commercial seed, commercial seed soaked in water and commercial seed soaked in hydrogen peroxide. No regularity factor was included in this trial, the whole trial being drilled at 9.5 cm spacing and then singled after the final seedling count was made in early May.

Method

Commercial grade sugar beet seed that had been prepared normally up to the point of pelleting was 'primed' by soaking in 0.2% (w/v) hydrogen peroxide for 10 hours in the laboratory and then dried back to its original moisture content. A further sample was soaked in water for a similar period and then dried. This latter treatment was a steeping as opposed to a washing process. The seed was then pelleted for sowing with a precision drill.

Treatments

Variety
- Bush Mono G
- Anono
- Nono
- Sharpe's Klein Monobeet

Seed priming
- Commercial seed
- Commercial seed soaked in H_2O
- Commercial seed soaked in H_2O_2

The trial was drilled on 2 April. Counts were made on 22, 24, 25, 27 April and 5 May to determine the pattern of seedling emergence. Seedlings from $2m^2$ were harvested on 25 May washed and dried for determination of seedling dry weight. The trial was singled on 25 and 26 May to give a regular distribution of 65,500 plants/ha. The trial was hand harvested on 17 October.

RESULTS

The experimental area was affected by wind damage and consequently the results must be considered with this in mind.

The seedling numbers are given below.

Seedling emergence plants/ha (thousands)

Variety	Conn. (control)	Conn. + H_2O	Conn. + H_2O_2	Conn. (control)	Conn. + H_2O	Conn. + H_2O_2	Conn. (control)	Conn. + H_2O	Conn. + H_2O_2
	22 April			24 April			25 April		
	(±2.88)			(±4.59)			(±7.11)		
Bush Mono G	9.2	22.2	33.8	87.8	108.5	116.8	112.5	123.8	128.8
Anono	11.5	9.2	41.0	83.8	67.7	111.5	100.0	102.0	119.3
Nono	6.2	6.5	35.7	80.2	85.0	121.8	113.0	106.8	126.3
Sharpe's Klein Monobeet	3.8	5.5	13.5	67.3	68.7	93.0	103.5	116.2	111.8
	(±1.44)			(±2.29)			(±3.55)		
Mean	7.7	10.8	31.0	79.8	82.5	110.8	107.2	112.2	121.6
	27 April			5 May					
	(±5.44)			(±6.12)					
Bush Mono G	126.8	136.5	127.0	148.8	150.2	146.3			
Anono	111.5	105.3	125.2	126.7	137.5	145.2			
Nono	122.2	119.0	128.0	150.3	143.0	153.8			
Sharpe's Klein Monobeet	119.5	121.8	115.3	137.3	143.5	132.2			
	(±2.72)			(±3.06)					
Mean	120.0	120.7	123.9	140.8	143.5	144.4			

The first and second seedling counts 20 and 22 days after drilling showed a much higher seedling count with the hydrogen peroxide treated seed with all varieties. Nono was the most responsive and Sharpe's Klein Monobeet was the least responsive. Bush Mono G responded favourably to the washing in water treatment at both these counts. In subsequent counts the difference between primed and unprimed became less so that by 5 May differences were observed on Anono only. This could be explained to a large extent by the unusually low figure for the commercial seed of this variety.

Dry weight per seedling taken on 25 May was somewhat eratic. Seed priming with H_2O_2 actually decreased dry weight per plant but this failed to reach statistical significance and the variable nature of this particular recording does not give much credence to this result.

At harvest plant populations were somewhat eratic and were not affected by priming treatment.

Yield of sugar (tonnes/ha)

Variety	Commercial (control)	Commercial H_2^+0	Commercial $H_2^+0_2$	Mean
Bush Mono G	5.82	5.25	6.38	5.81
Amono	6.09	6.30	5.50	5.96
Nono	5.25	6.09	5.23	5.52
Sharpe's Klein Monobeet	6.35	4.61	5.48	5.48
		($\pm$0.595)		($\pm$0.344)
Mean	5.88	5.56	5.65	
		($\pm$0.298)		
Standard error as % G.M.		18.1%		

When the trial was harvested on 17 October the variable nature of the yields gave some unexpected but statistically non-significant results. No effect was observed on sugar content. Seed priming had a marginally lower yield than commercial seed. Bush Mono was the only variety to respond in terms of sugar yield to seed priming with H_2O_2 whilst Amono and Sharpe's Klein Monobeet both had reduced yields with this treatment. Nono which was the only variety to show any benefits from seed priming in the Morley trial did not respond to this treatment in the Larling out-centre.

The variable nature of this trial was due in part to wind erosion which affected certain areas of the trial and the results obtained should therefore be viewed with a considerable degree of caution.