

Summary

After a slow start the 1985 crop produced a good yield of sugar. Sugar content rose from 14% in mid-September to a maximum of 19.3% in early November and had fallen to only 17.7% by late December. Sugar yield reached 11 t/ha by early November.

Object

To monitor the progress of the beet crop through the harvest campaign period.

Materials and method

Four 20 m² plots were hand harvested at fortnightly intervals and samples were washed, weighed and sugar content determined from brei samples. The first lift was made on 12 September, but it was subsequently found that the rest of the site chosen for the trial had a patchy plant population. So a new site had to be chosen, but unfortunately this meant that the data from the first lift had to be discarded.

Results and conclusions

The plant population averaged 73,500/ha (range 70,000 to 76,400/ha), slightly below the target of 75,000/ha but not sufficiently low to significantly affect yields. These differences in plant populations at the different harvests were not statistically significant.

Yield data periodic harvest 1985

Harvest date	Clean root yield t/ha	Sugar content %	Sugar yield t/ha
12 September (1st site)	(42.3)	(14.61)	(6.2)
(ESE)	(+1.39)	(+0.147)	(+0.29)
26 September	47.7	17.48	8.3
10 October	52.8	17.73	9.4
24 October	55.5	19.02	10.6
7 November	57.2	19.30	11.0
21 November	54.3	19.06	10.4
5 December	61.1	17.92	11.0
19 December	62.6	17.72	11.1
S.E. per plot (18 d.f.)	+2.78	+0.295	+0.58
or % G.M	5.0%	1.6%	5.7%

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Sugar content was low (14.6%) on 12 September (from the first site) but rose to a maximum of 19.30% in early November. Sugar content was still high (17.72%) on the last lift in December.

Root yields rose steadily in late September - late October but then remained fairly static apart from a slight but insignificant dip in late November. The maximum root yield was reached on the last harvest date and this was significantly higher than the yields obtained on or before 21 November.

Sugar yield reached 11.03 t/ha on 7 November and remained at this level, apart from a fall on 21 November which followed a spell of cold weather. The slight but progressive fall in sugar content from 5 December was compensated for by an increase in root yield.

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Periodic harvest of sugar beet, 1985

Field data

Soil type: Sandy loam (Ashley series)

Previous cropping: 1983 Winter Wheat
1984 Winter Wheat

Cultivations: 5 April dutch harrow x 2

Fertilisers: Before ploughing: 1550 kg/ha Magnatrox containing
7% P₂O₅, 29% K₂O, 9.5% Na, 5% Mg + 0.37% Boron giving
0 : 109 : 450 kg/ha

33.5% N at 126 kg/ha split between 19 April (42 kg) and
post-emergence 25 May (84 kg)

Drilled: 5 April (50 cm rows, 16 cm seed spacing)

Variety: Monoire

Herbicides: 17 May Goltix WG + Betanal E 1.5 kg + 2.5 l/ha
28 May Goltix WG + Nortron 1.5 kg + 1.7 l/ha
29 May Tractor hoed
4 July Tractor hoed

1985 Weather (17 year mean in brackets)

Month	Rainfall mm		Sunshine hours		Mean temp oC	
January	62.3	(58.0)	53.8	(51.3)	-0.3	(3.3)
February	5.0	(41.0)	81.8	(67.7)	1.4	(3.1)
March	40.9	(45.7)	101.0	(100.6)	4.3	(5.2)
April	67.2	(42.9)	136.7	(153.2)	8.6	(7.3)
May	53.6	(49.3)	139.6	(190.3)	10.7	(10.9)
June	153.1	(54.6)	165.2	(200.4)	12.6	(13.9)
July	54.6	(47.6)	221.9	(195.5)	16.4	(16.0)
August	57.2	(46.4)	182.0	(186.5)	15.1	(16.1)
September	13.3	(47.3)	127.3	(148.5)	14.5	(13.9)
October	13.2	(48.9)	123.0	(109.9)	11.2	(10.4)
November	50.7	(61.2)	96.5	(69.3)	3.7	(6.4)
December	81.9	(55.8)	28.7	(49.2)	6.4	(4.3)
Total	652.0	(604.7)	1457.5	(1522.4)		

Weather

The crop was drilled into a moist seedbed. Heavy rain followed two days later and the rest of the month of April was wetter, duller and cooler than average. Consequently emergence was slow and poorer than 'normal'. May and June were cooler and wetter than the long term mean, particularly June, and sunshine was well below average. A sunny, wet and warm July was followed by a cool wet August. The autumn months of September and October were very dry with above average temperatures and sunshine, although September was cloudier than normal. November was very sunny and had below average rainfall but temperatures were 3°C below the long term mean. December was very wet, cloudy and very mild up to the last harvest date.

Soil moisture

Weekly estimates of ground cover were taken from early April to mid September for soil moisture deficit determinations by Norsk Hydro Fertilisers.

The soil moisture deficit remained at a very low level throughout May and rose in early June to 17 mm. The extremely wet June reduced the deficit to nil and it remained so until early July. It rose from 17 mm on 8 July to 33 mm on the 15th and remained below 40 mm throughout July because of the adequate rainfall. Heavy rain in early August produced a fall in the deficit to 22 mm on 12 August and it did not rise above 30 mm until late in the month. Dry weather in September produced a steady climb in the deficit from 49 mm on the 2nd to 63 mm on the 16th when recordings ceased.

Crop growth

Growth was slow in the cool dull May and June but improved markedly in July and August. The warm dry September produced a steady growth of roots and a dramatic rise in sugar content. The warm and dry October produced a continued rise in sugar content and sugar yields. The biggest daily gain in sugar yield of 86 kg/ha/day was between 10 October and 24 October. The average daily gain from 26 September to the date of maximum yield i.e. 19 December was 49 kg/ha/day. There was a fall in yield between 7 and 21 November, possibly due to the cold weather. The subsequent rise in yield of washed beet per plant and per hectare between 21 November and 5 December reached statistical significance. The rise in sugar yield during this period was not statistically significant.