

Title: SBT23-810 Periodic harvest of sugar beet and fungicide interaction

Trial Code: SBT23-810

Centre: Morley

Crop: Sugar Beet

Variety: Stewart

Report author: Nathan Morris



Objective:

To determine the growth rate and yield benefit of sugar beet treated during the late summer and autumn with and without a triazole and strobilurin fungicide programme.

Background:

In 1997 a long-term study was initiated at Morley to examine the relationship between yield and lifting date in sugar beet; this is known as the 'periodic lift study'. Between 2007 and 2018 the monthly comparisons of adjusted yields were carried out either following, or in the absence of, a summer fungicide regime (using triazole-based products). For 2019-2023 monthly lift timings have been condensed into 3 timings throughout the campaign (September, November and January).

Summary:

In 2023 the programme was based on either a one or two-spray programme of Angle (azoxystrobin and difenoconazole), with an additional three-spray programme, including Caligula (fluopyram and prothioconazole) applied in late September (Table 1). T1, T2 and T3 fungicides were applied on 18/07/23, 23/08/23 and 19/09/23, respectively. All other inputs were farm standard.

Treatments:

Trt	Treatments T1	Treatments T2	Treatments T3	Lift dates
	Mid-July	Mid-August (4 week interval)	Late September (6 week interval)	Third Week of (or as close to)
1	Untreated	-	-	September
2	Angle @ 1.0 l/ha	-	-	September (One spray programme)
3	Angle @ 1.0 l/ha	Angle @ 1.0 l/ha	-	September (Two spray programme)
4	Untreated	-	-	November
5	Angle @ 1.0 l/ha	-	-	November (One spray programme)
6	Angle @ 1.0 l/ha	Angle @ 1.0 l/ha	-	November (Two spray programme)
7	Untreated	-	-	January
8	Angle @ 1.0 l/ha	-	-	January (One spray programme)
9	Angle @ 1.0 l/ha	Angle @ 1.0 l/ha	-	January (Two spray programme)
10	Angle	Angle	Caligula	January (Three spray programme)

This trial was funded by NIAB Morley Long-term Studies programme

@ 1.0 l/ha

@ 1.0 l/ha

@ 1.2 l/ha

Results

In 2023 cv Stewart was drilled on 7/4/23. This variety has low disease-resistant ratings with 2.8 for rust, 4.0 for powdery mildew and 5.5 for cercospera. The establishment of sugar beet in 2023 was difficult as the conditions were dry after drilling. The weather then settled in to be changeable with thankfully no repeat of the 2022 heatwave. The more favourable growing conditions resulted in the highest yield of 140.2 adjusted tonnes/ha from treatment 9, January lift with a two-spray fungicide programme.

This year, with cyproconazole no longer available, the programme was based on Angle (azoxystrobin and difenoconazole) applied at the full dose rate (1.0 L/ha) on 18/07/23 and 23/08/23 comparing a one and two spray programme for each lift date plus an untreated. Caligula (fluopyram and prothioconazole) at the full dose rate (1.2L/ha) was applied on 19/09/23 as a third fungicide only for the last lift date. The lift dates were 19/09/23, 22/11/23 and 09/01/24.

At each lift timing the untreated plots were assessed for green leaf area, *Uromyces betae* (rust) and *Cercospora beticola* (leaf spot). These are assessed by estimating the total % of each of the total leaf area. There were significant levels of *Cercospora* and rust noted on some plots in the autumn and these coincided with the no fungicide or one single fungicide treatments. Disease levels were negligible by January even in the untreated. Very low levels of virus yellows were noted.

- Figure 1 shows the yield from each lift date for all the treatments. This year, the higher yields came from the T1 and T1+T2 November lift and the T1 plus T2 January lift. The additional T3 fungicide spray on the January lift did not show any benefit and the yields from this treatment were nearly 15 t/ha less than the two-spray fungicide programme. Although there were no significant differences in the November and January lift programmes, the early lift dates were significantly lower than the later lifts.

- There was a difference in sugar percentage (Figure 2) with the second lift being significantly higher than the early lift, the third lift date this year may well have suffered from an unusually cold spell in mid-December. There were no significant differences between treatments within each lift date. There was a difference in the potassium (K) levels with the untreated in the first two lifts being significantly different from the treated but in the January lift, the untreated had the lowest K levels. There were no differences within the lift dates for Sodium (Na) levels although all the treatments in the January lift were significantly lower than the autumn lift dates.

Figure 1. Yield is shown (t/ha) across three lifting dates v fungicide treatments.

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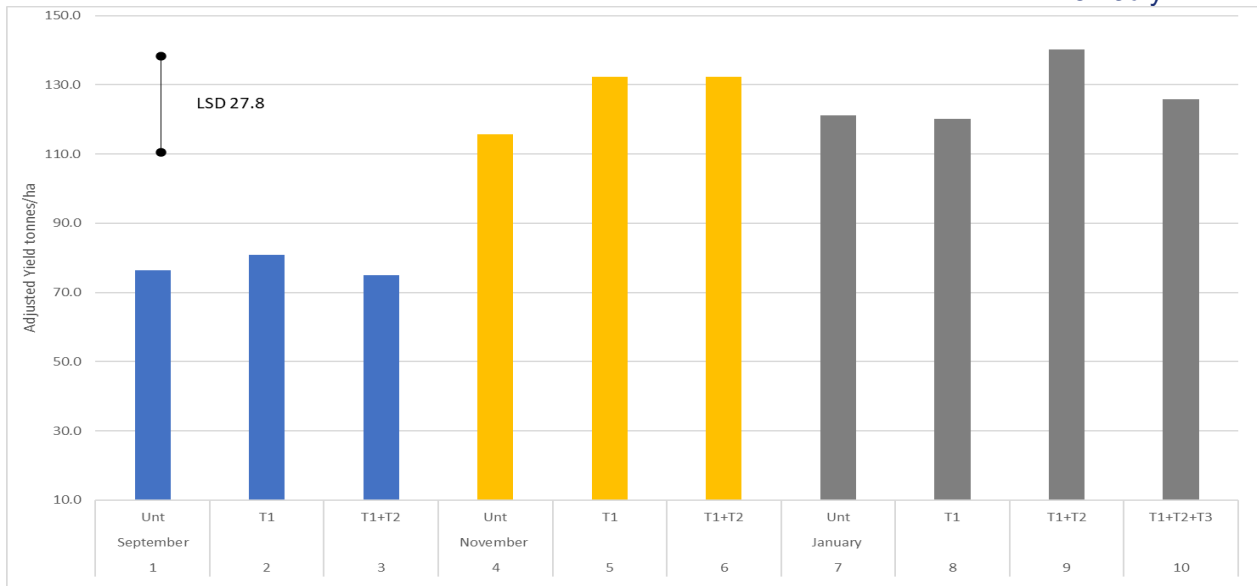
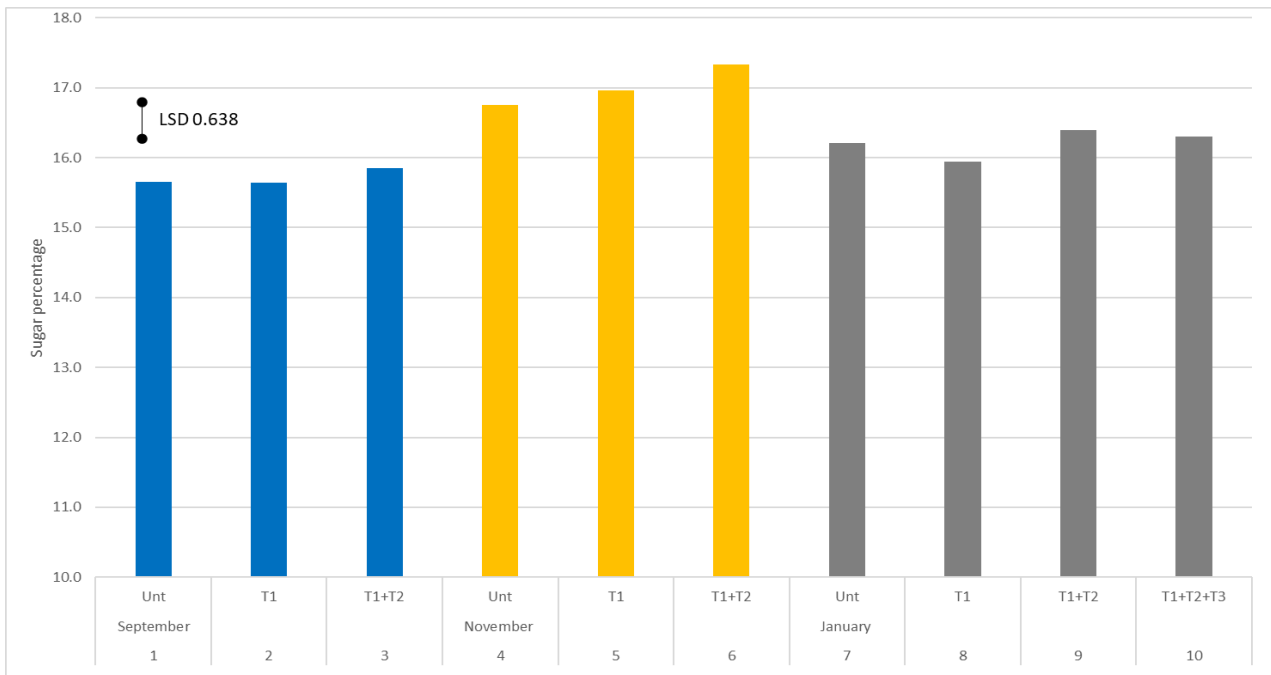


Figure 2. Percentage sugar across three lifting dates v fungicide treatments.



Appendix

Field details

Trial Code	SBT23-810
Trial Centre	Morley
Trial Location	Morley
Crop	Sugar beet
Previous Crop	Winter wheat

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Soil Texture	Sandy loam
Soil Series	Ashley series
Soil Analysis	N/A
Soil Mineral Nitrogen	N/A
Total N/ha applied	120 kg N/ha
Drill Date	21/09/22
Seed Rate	1.2 Unit/ha
Drilled Plot Dimensions	3m x 10m (farm crop)
Replicates	3
Harvest Date	Various (as treatments)

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