

Periodic harvest of sugar beet and fungicide interaction

Centre: Morley

Trial Code: SBT14-810

Variety: Springbok

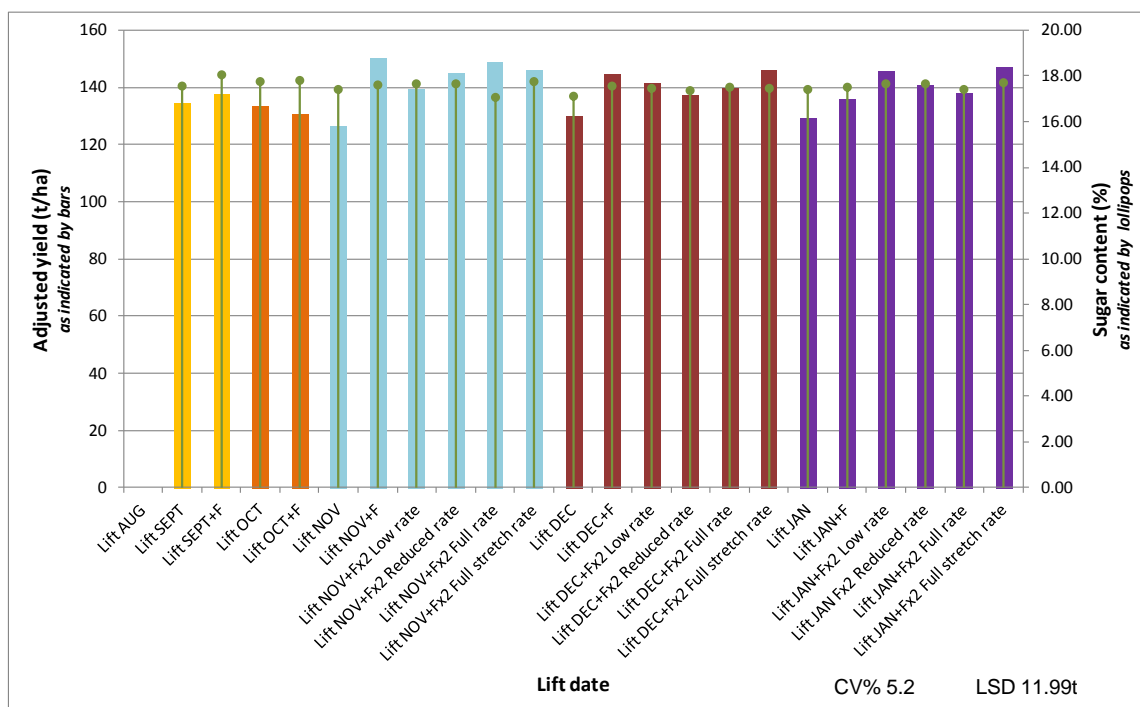
Objective: To determine the growth rate and yield benefit of sugar beet treated with and without a triazole based fungicide programme during the summer and early autumn.

Theme: Long term monitoring

Summary

Since 2007 monthly comparisons of adjusted yields have been carried out either following, or in the absence of, a summer fungicide regime (using a triazole based product) and examines the relationship between yield and lifting date in sugar beet; this is known as the 'periodic lift study'. The addition of a single or two spray programme increased mean treatment yield by 6 % and 10 % respectively, compared to the analogous untreated lift without fungicide. This therefore shows the potential value for the inclusion of fungicide sprays to the sugar beet crop, later lift timings indicate the additional protection offered by a two spray programme.

Figure 1: The effect of a one or two spray fungicide programme on yield response and sugar content in sugar beet, Morley 2014



Fungicide: Escolta @ 0.35 l/ha or 0.175 l/ha applied in late July (1 spray programme) and late August (2 spray programme) or mid September (2 spray stretch programme)

Lift DEC - December untreated; Lift DEC+F – 1 spray fungicide programme; Lift DEC+Fx2 Low rate – 2 spray low rate fungicide programme; Lift DEC+Fx2 Reduced rate – 2 spray reduced rate fungicide programme; Lift DEC+Fx2 Full rate – 2 spray full rate fungicide programme; Lift DEC+Fx2 Full stretch rate – 2 spray full stretch rate fungicide programme.

This trial was funded by NIAB TAG National Agronomy Centre Initiative

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- 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'. Since 2007 the monthly comparisons of adjusted yields have been carried out either following, or in the absence of, a summer fungicide regime (using a triazole based product).
- In 2014 the sugar beet (cv Springbok) was drilled on 23/03/2014 and all crop inputs were as the Morley Farm crop with the exception of fungicide applications (see input appendix for details).
- In 2014, rather than a triazole alone, the programme was based on Escolta (cyproconazole + trifloxystrobin) applied on 31st July, 24th August and 12^h September 2014. The programme compared a one or two spray fungicide regime (Table 1). The two spray programme was applied at either a low rate (0.175 l/ha fb 0.175 l/ha), a reduced rate (0.35 l/ha fb 0.175 l/ha), a full rate or a full rate stretched programme (0.35 l/ha fb 0.35 l/ha).
- Maximum yield was achieved from the one spray full rate fungicide programme lifted in November with a total adjusted yield of 150 t/ha compared to the analogous untreated that achieved 126 t/ha. Adjusted yield response and sugar content at monthly lift intervals are shown in Figure 1. Yield and sugar content results from the August lift are not presented due to a technical error during factory processing.
- The addition of a full rate single fungicide spray gave an average yield response of 6 % across the analogous lift timings compared to the analogous untreated lift without fungicide. The addition of a full rate two spray programme increased yields by an average of 10 % across the analogous lift timings compared to the analogous untreated lift without fungicide. The main diseases were Ramularia and Rust found at around 5 % infection in the untreated. The value of a two spray programme becomes particularly apparent at the later lift timings indicating the additional protection offered to that of a single spray.
- The margins over untreated (based on a crop price of £31.67/t and either a single fungicide spray that costs £30/ha including application or a two spray application costing £60/ha) are shown in Table 2. Where comparing a single spray programme over the untreated, the one spray programme returned, on average, £261/ha compared to the analogous untreated lift when averaged across September through January lift timings (five lift timings).
- A two spray programme, when averaged across November through January lift timings (three lift timings) indicated that a two spray full rate programme returned, on average, £380/ha compared to the analogous untreated lift. A two spray full rate stretched programme returned an average £514/ha compared to the analogous untreated lift. This may suggest that by applying a fungicide later into the autumn could prolong the protection against disease and therefore the retention of leaves to maximise solar radiation capture during the autumn / winter period. This therefore shows the potential value for the inclusion of fungicide sprays to the sugar beet crop.
- This research is continuing, through the support of the NAC initiative, over the 2015/16 season. Further consolidated results will be reported in due course.

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Table 1: Treatments

TRT	Treatments T1	Treatments T2	Treatments T2	Lift dates
	Late July	Late August (4 week interval)	Mid September (6 week interval)	<i>Third Week of (or as close to)</i>
1	-	-		August
2	-	-		September
3	Escolta @ 0.35 l/ha	-		September (One spray programme – full rate)
4	-	-		October
5	Escolta @ 0.35 l/ha	-		October (One spray programme – full rate)
6	-	-		November
7	Escolta @ 0.35 l/ha	-		November (One spray programme – full rate)
8	Escolta @ 0.175 l/ha	Escolta @ 0.175 l/ha		November (Two spray programme – low rate)
9	Escolta @ 0.175 l/ha	Escolta @ 0.35 l/ha		November (Two spray programme – reduced rate)
10	Escolta @ 0.35 l/ha	Escolta @ 0.35 l/ha		November (Two spray programme – full rate)
11	Escolta @ 0.35 l/ha		Escolta @ 0.35 l/ha	November (Two spray stretch programme – full rate)
12	-	-		December
13	Escolta @ 0.35 l/ha	-		December (One spray programme – full rate)
14	Escolta @ 0.175 l/ha	Escolta @ 0.175 l/ha		December (Two spray programme – low rate)
15	Escolta @ 0.175 l/ha	Escolta @ 0.35 l/ha		December (Two spray programme – reduced rate)
16	Escolta @ 0.35 l/ha	Escolta @ 0.35 l/ha		December (Two spray programme – full rate)
17	Escolta @ 0.35 l/ha		Escolta @ 0.35 l/ha	December (Two spray stretch programme – full rate)
18	-	-		January
19	Escolta @ 0.35 l/ha	-		January (One spray programme – full rate)
20	Escolta @ 0.175 l/ha	Escolta @ 0.175 l/ha		January (Two spray programme – low rate)
21	Escolta @ 0.175 l/ha	Escolta @ 0.35 l/ha		January (Two spray programme – reduced rate)
22	Escolta @ 0.35 l/ha	Escolta @ 0.35 l/ha		January (Two spray programme – full rate)
23	Escolta @ 0.35 l/ha		Escolta @ 0.35 l/ha	January (Two spray stretch programme – full rate)

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Table 2: Margin over untreated (output – fungicide cost*) 2014.

Lift dates	Margin over analogous untreated (£/ha)			
<i>Third Week of (or as close to)</i>	<i>One spray programme (full rate)</i>	<i>Two spray programme (low rate)</i>	<i>Two spray programme (full rate)</i>	<i>Two spray programme (full stretch rate)</i>
August	-	-	-	-
September	67	-	-	-
October	-121	-	-	-
November	735	352	650	569
December	439	303	257	454
January	185	469	231	519
<i>Average</i>	<i>261</i>	<i>375</i>	<i>380</i>	<i>514</i>

* Sugar beet price £31.67/tonne. Fungicide cost £30/ha including application.

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Input Appendix: Field details & overall applications to crop

Crop:	Sugar beet
Trial ID:	SBT14-810
Location: Name and 6 fig grid ref	Morley
Soil type:	Ashley Series
Soil analysis:	
Previous crop:	Winter wheat
Drill date: dd/mm/yy	23/03/2014
Drilled plot size: m2	6 x 10m ² (inc. buffers)
Replicates:	3

Input type	Product	Product rate	Date
Herbicide:	Rosate 36	4 l/ha	19/02/2014
	Companion Gold	0.5 kg/ha	19/02/2014
	Takron	2.4 l/ha	25/03/2014
	Target SC	1.0 l/ha	13/04/2014
	Beta-Team	1.0 l/ha	13/04/2014
	Safari Lite WSB	210 g/ha	24/04/2014
	Beta-Team	1.0 l/ha	24/04/2014
	Safari Lite WSB	200 g/ha	20/05/2014
	Beta-Team	1.25 l/ha	20/05/2014
	Target SC	1.0 l/ha	02/06/2014
Fertiliser:	Life Scientific Clopyralid	1.0 l/ha	09/06/2014
	Falcon	0.7 l/ha	09/06/2014
	Kaimag 75.35.130.200	107 kg K/ha 45 kg Mg/ha 148 kg Na/ha 15 kg P/ha	10/09/2013
	Liquid N 27 + S	70 kg N/ha 5 kg S/ha	25/03/2014
	Liquid N 27 + S	50 kg N/ha 4 kg S/ha	16/05/2014
	Groove (Managanese)	0.5 kg/ha	24/04/2014
Adjuvant:	Logic	0.5 l/ha	20/05/2014

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