

## WW19-010: Fungicide timing response monitoring in Winter Wheat at Benniworth, Morley and Sutton Scotney

**Trial Code** : WW19-010

**Centre** : Morley, Sutton Scotney, Benniworth

**Crop** : Winter Wheat

**Variety** : RGT Gravity

### Objective

To record and monitor the yield responses to each of the component spray timings within a fungicide spray programme on wheat

### Summary

This trial is jointly funded by The Morley Agricultural Foundation Mentor project and NIAB TAG members.

Disease levels were low and disease was only evident at all sites from late June

At Morley, 2019 turned out to be a low response year with a total fungicide response of only 0.87 t/ha which mirrors the disease seen and is considerably less than the 34 year average response of 2.19 t/ha.

As at Morley, Sutton Scotney had a lower than average fungicide response of 1.01 t/ha, in 2019 with no response at all at T3. The 13 year mean total response is 1.72 t/ha.

At Caythorpe, the total fungicide response was relatively low at 1.24 t/ha but similar to the longer term mean of 1.27 t/ha. The site did show a positive T0 response for the first time in five years but the overall five year mean for a T0 is negative.

### Treatments

#### Products

Product	Active ingredient and concentration
Adexar	epoxiconazole 62.5 g/l + fluxapyroxad 62.5 g/l
Bravo 500	chlorothalonil 500 g/l
Confucius	chlorothalonil 375 g/l + tebuconazole 125 g/l
Prosaro	prothioconazole 125 g/l + tebuconazole 125 g/l

#### Treatments

Trt No	Description	GS 30 T0	GS 32 T1	GS 39 T2	GS 61 T3
1	Untreated	Untreated	-	-	-
2	T1 alone	-	Adexar 1 l/ha + Bravo 500 1 l/ha	-	-
3	T2 alone	-	-	Adexar 1.25 l/ha + Bravo 500 1 l/ha	-
4	T3 alone	-	-	-	Prosaro 0.66 l/ha
5	T1 + T2	-	Adexar 1 l/ha + Bravo 500 1 l/ha	Adexar 1.25 l/ha + Bravo 500 1 l/ha	-

6	T1 + T3	-	Adexar 1 l/ha + Bravo 500 1 l/ha	-	Prosaro 0.66 l/ha
7	T2 + T3	-	-	Adexar 1.25 l/ha + Bravo 500 1 l/ha	Prosaro 0.66 l/ha
8	T1, T2 & T3	-	Adexar 1 l/ha + Bravo 500 1 l/ha	Adexar 1.25 l/ha + Bravo 500 1 l/ha	Prosaro 0.66 l/ha
9	T0, T2 & T3	Confucius 1.25 l/ha	-	Adexar 1.25 l/ha + Bravo 500 1 l/ha	Prosaro 0.66 l/ha
10	T0, T1, T2 & T3	Confucius 1.25 l/ha	Adexar 1 l/ha + Bravo 500 1 l/ha	Adexar 1.25 l/ha + Bravo 500 1 l/ha	Prosaro 0.66 l/ha

## Results

The variety used is the same at all sites each year but over the years the variety is changed to keep up with conventional standards. The variety chosen is usually a moderately susceptible variety to disease so responses in more disease resistant or susceptible varieties may be different.

Disease levels were relatively low at all sites with no significant disease seen until late June.

At Morley, Brown rust quickly established in late June on the top 3 leaves but septoria levels were low all season.

*Septoria tritici* developed in late June at Caythorpe on the top three leaves at relatively low levels and brown rust was not present.

At Sutton Scotney, no disease was seen until late June when septoria developed rapidly on leaf three but did not spread to upper leaves. No brown rust was seen.

Table 1: Yield at all sites and 3 site mean in 2019

Trt No	Description	Caythorpe yield t/ha	S.Scotney yield t/ha	Morley yield t/ha	3 Site mean yield t/ha
1	Untreated	8.82	10.65	9.98	9.82
2	T1 alone	9.40	11.02	10.36	10.26
3	T2 alone	9.39	10.95	11.03	10.46
4	T3 alone	8.94	10.84	10.08	9.95
5	T1 + T2	9.84	11.43	11.57	10.95
6	T1 + T3	9.46	11.30	10.92	10.56
7	T2 + T3	9.25	11.06	11.42	10.58
8	T1, T2 & T3	9.66	11.28	11.74	10.89
9	T0, T2 & T3	9.33	11.23	11.63	10.73
10	T0, T1, T2 & T3	9.88	11.51	11.85	11.08
	LSD	0.29	0.62	0.39	0.49
	CV%	1.78	3.26	2.1	2.7

Table 1 above and figures 1 and 2 below show relatively small fungicide yield responses at all sites with some treatments not significantly different from the untreated.

Figure 1: Yield (mean of 3 sites)

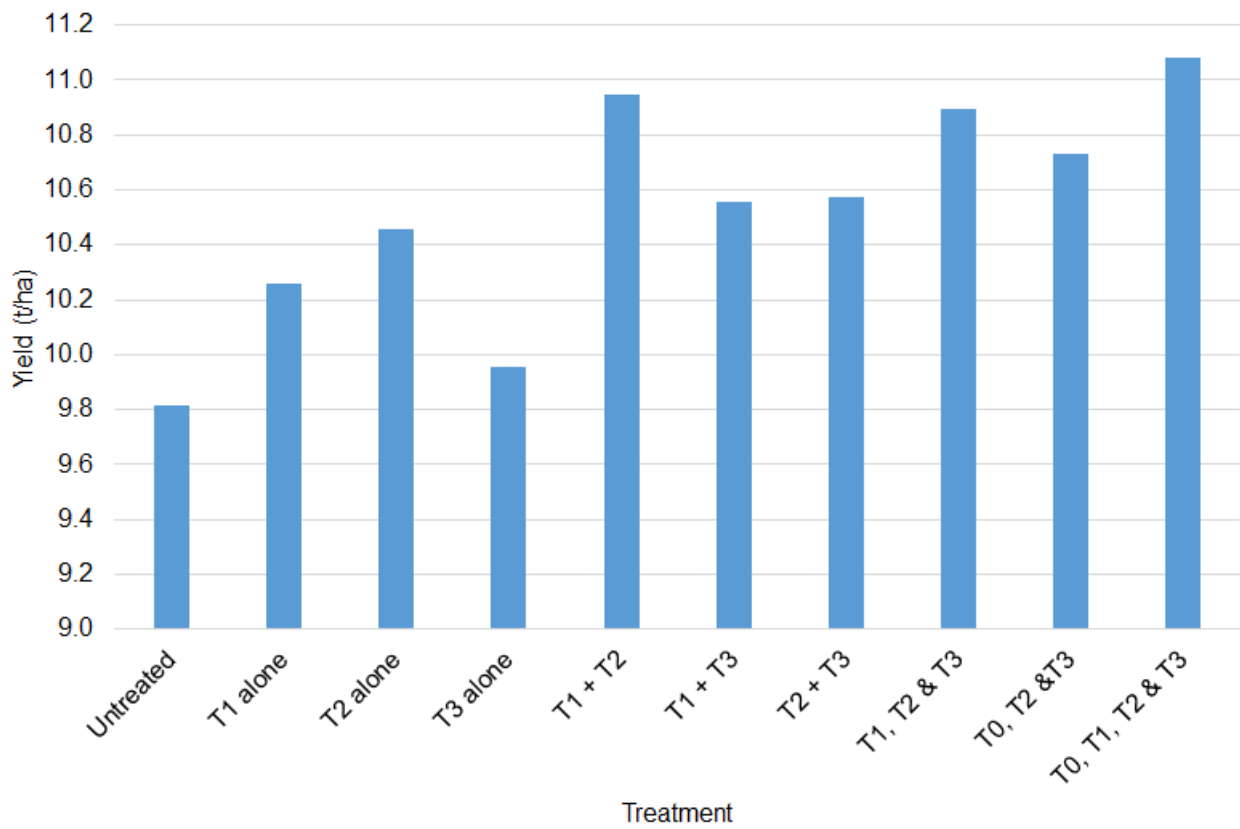


Figure 2: Yield at individual sites

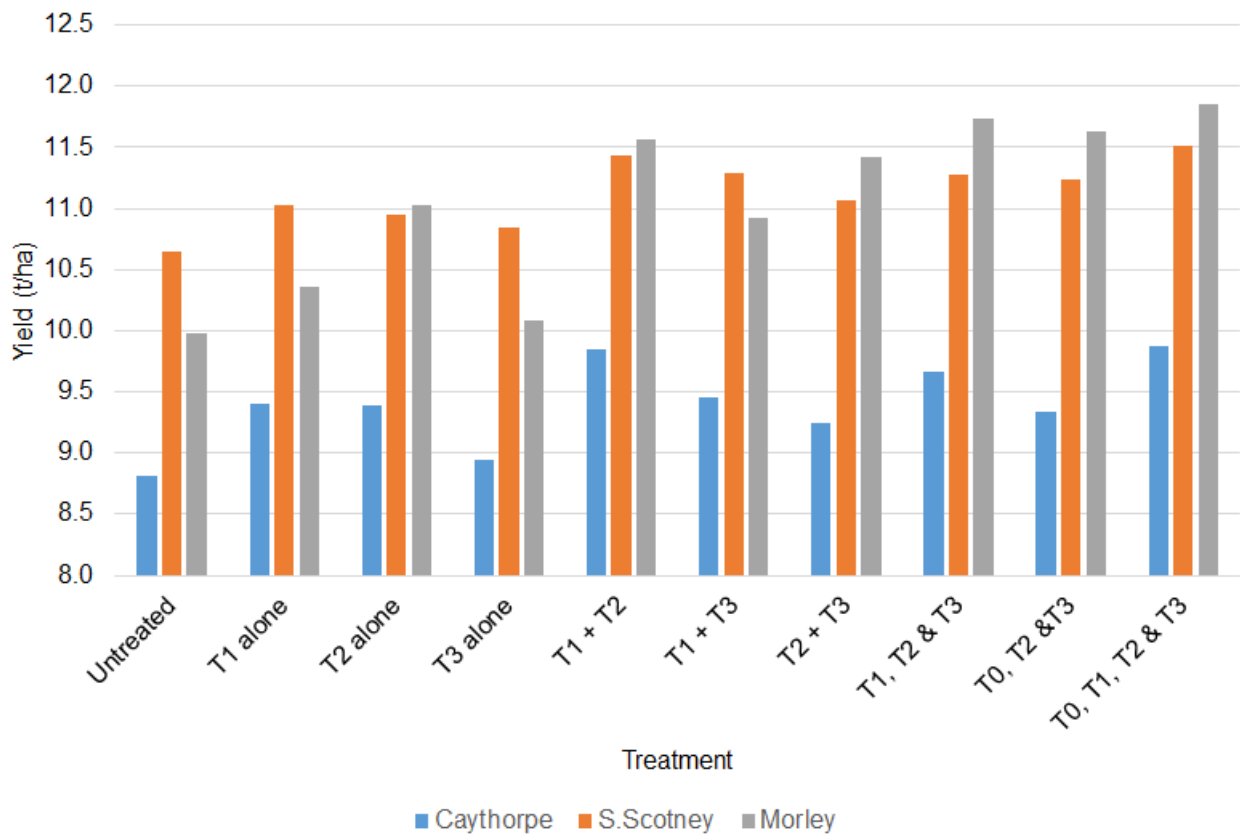


Table 2: Component yield responses at each site and 3 site mean in 2019

Comparison	Yield Response Caythorpe t/ha	Yield Response S.Scotney t/ha	Yield Response Morley t/ha	3 Site Yield Response t/ha
Benefit of T1+T2 vs untreated	1.02	0.78	0.59	0.80
Benefit of T3 vs Standard T1+T2	-0.18	-0.15	0.17	-0.05
Benefit of T0 vs Standard T1+T2+T3	0.22	0.23	0.11	0.19
Benefit of T1 alone vs untreated	0.58	0.37	0.38	0.44
Benefit of T2 alone vs untreated	0.57	0.30	1.05	0.64
Benefit of T3 alone vs untreated	0.12	0.19	0.10	0.14
LSD	0.29	0.62	0.39	0.49
CV%	1.78	3.26	2.1	2.7

Table 2 above shows the responses at each site at each spray timing as well as the three-site means. T0 responses were all small but positive but T3 responses, in addition to standard T1+ T2 sprays, were very variable with site. T1+T2 responses were all below 1 t/ha which is low compared to the the multi-year site means of between 1.23 t/ha and 1.77 t/ha shown in Table 3 below.

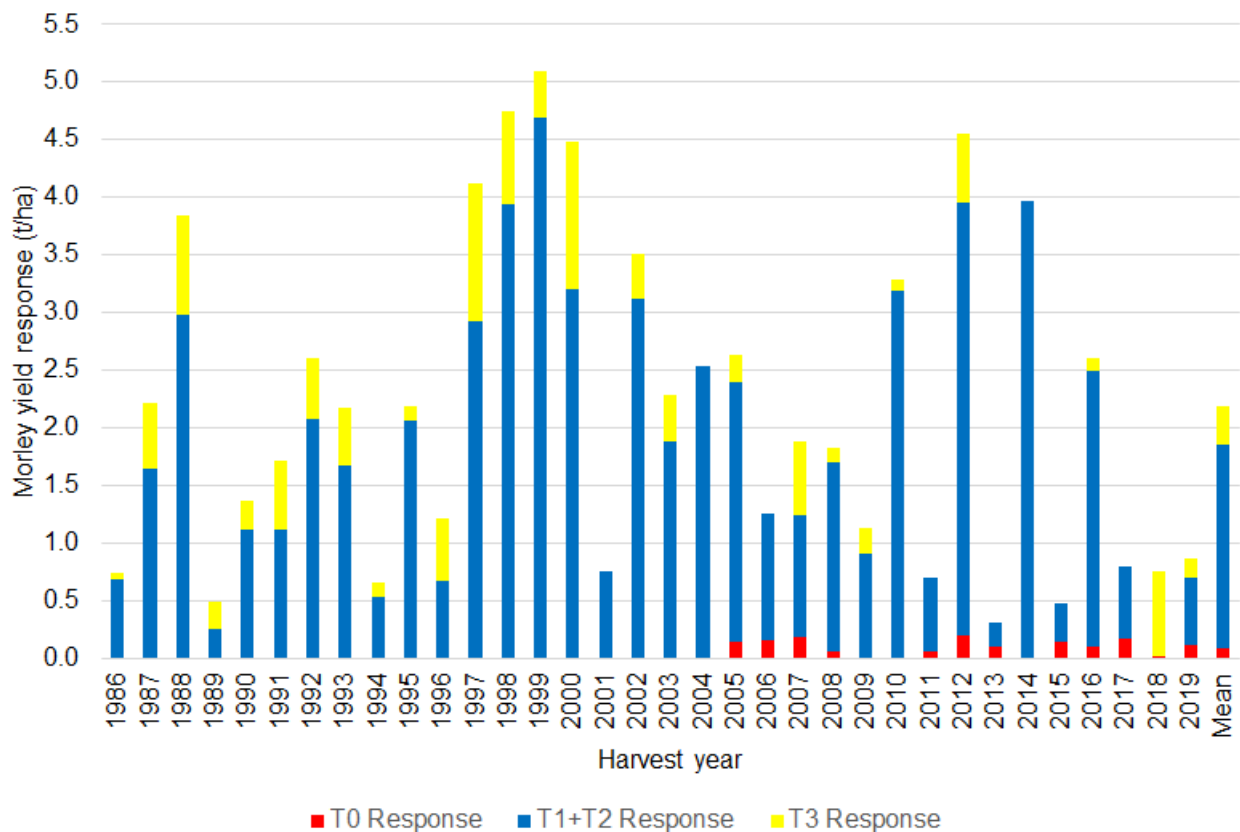
Table 3: Multi-year yield responses from 1986

Harvest Year	Morley Yield Responses t/ha			S.Scotney Yield Responses t/ha			Caythorpe yield responses t/ha		
	T0	T1+T2	T3	T0	T1+T2	T3	T0	T1+T2	T3
1986		0.69	0.05						
1987		1.64	0.57						
1988		2.98	0.87						
1989		0.26	0.23						
1990		1.11	0.25						
1991		1.12	0.6						
1992		2.08	0.53						
1993		1.67	0.5						
1994		0.53	0.13						
1995		2.06	0.13						
1996		0.67	0.54						
1997		2.92	1.2						
1998		3.94	0.81						
1999		4.69	0.41						
2000		3.21	1.28						
2001		0.75	0						
2002		3.12	0.39						
2003		1.88	0.4						
2004		2.53	0						
2005	0.14	2.26	0.23						
2006	0.15	1.11	0						
2007	0.19	1.05	0.64	-0.02	1.68	0.41			
2008	0.06	1.64	0.13	-0.05	2.53	0.11			

2009	0	0.91	0.22	-0.12	2.12	0.2			
2010	0	3.19	0.09	0.32	2.39	-0.5			
2011	0.06	0.64	-0.09	0.40	1.16	0.07			
2012	0.2	3.76	0.59	-0.10	1.48	0.63	-0.18	2.94	1.13
2013	0.1	0.21	-0.03	0.30	0.53	-0.02			
2014	-0.09	3.97	-0.26	-0.16	2.60	0.26			
2015	0.14	0.33	-0.14	-0.13	0.64	0.16			
2016	0.1	2.39	0.12	-0.05	1.97	0.21	-0.18	0.96	0.24
2017	0.17	0.63	-0.19	0.65	1.58	-0.35	-0.41	0.27	0.68
2018	0.01	-0.3	0.75	0.06	0.13	0.35	-0.55	0.96	-0.50
2019	0.11	0.59	0.17	0.23	0.78	-0.15	0.22	1.02	-0.18
Mean	0.09	1.77	0.33	0.10	1.51	0.11	-0.22	1.23	0.27
Mean Total Response			2.19			1.72			1.28

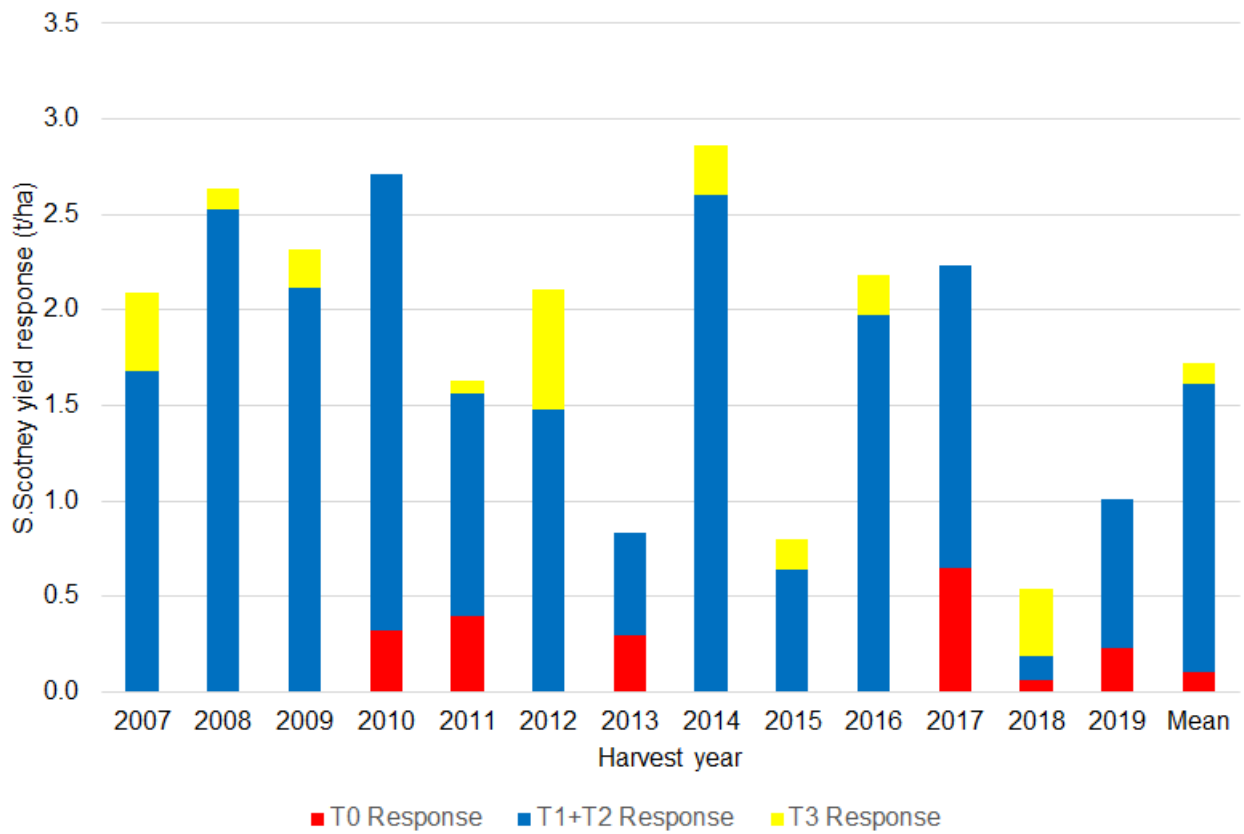
Table 3 shows the yield responses at T0, T1+T2 and T3 for each site starting in 1986 at Morley. Some of these fungicide responses were negative and both negative and positive figures have been used to create the multi-year means for each timing, at each site, shown at the bottom of table 3 and in figures 3 to 5 below. However, for clarity, in figures 3 to 5 below, negative responses are not shown.

Figure 3: 34 Year fungicide yield responses at Morley. 34 year mean: T0 = 0.09 t/ha, T1+T2 = 1.77 t/ha, T3 = 0.33 t/ha, Total average response = 2.19 t/ha



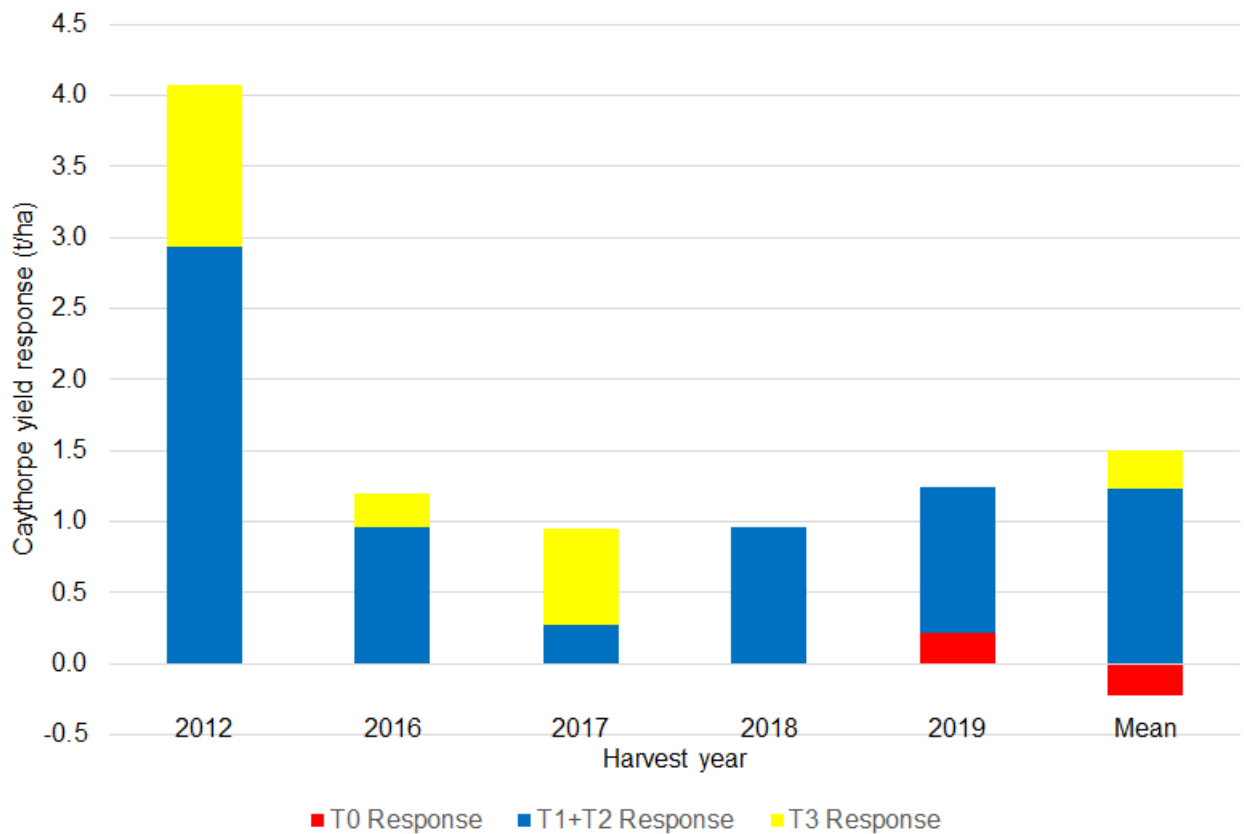
At Morley, 2019 was a low response year with a total fungicide response of only 0.87 t/ha which mirrors the disease levels seen and is considerably less than the 34 year mean total response of 2.19 t/ha.

Figure 4: 13 Year fungicide yield responses at Sutton Scotney. 13 year mean: T0 = 0.10 t/ha, T1+T2 = 1.51 t/ha, T3 = 0.11 t/ha, Total average response = 1.72 t/ha



As at Morley, Sutton Scotney had a lower than average fungicide response of 1.01 t/ha, in 2019 with no response at all at T3. The 13 year mean total response is 1.72 t/ha.

Figure 5: 5 Year fungicide yield responses at Caythorpe. 5 year mean: T0 = -0.22 t/ha, T1+T2 = 1.23 t/ha, T3 = 0.27 t/ha, Total average response = 1.28 t/ha



At Caythorpe, the total fungicide response was both relatively low at 1.24 t/ha but similar to the longer term mean of 1.27 t/ha. The site did show a positive T0 response for the first time in five years but the overall five year mean for a T0 is negative.

## Appendix

### Field details:

Trial Code	WW19-010	WW19-010	WW19-010
Trial Centre	Benniworth	Sutton Scotney	Morley
Trial Location	Caythorpe	Sutton Scotney trial centre	Morley trial centre
Crop	Winter wheat	Winter wheat	Winter wheat
Previous Crop	Winter oilseed rape	Winter oilseed rape	Winter oilseed rape
Soil Texture	Sandy loam	Silty clay loam	Clay Loam
Soil Series	Elmton 1	Andover 1	N/A
Soil Analysis	pH 8.0, P 18 mg/l, K 147 mg/l, Mg 42 mg/l	pH 7.4, P 20 mg/l, K 243 mg/l, Mg 64 mg/l	N/A
Soil Mineral Nitrogen	0-30 cm 17 kgN/ha, 30-60 cm 25 kgN/ha	N/A	0-30 cm 14 kgN/ha, 30-60 cm 15 kgN/ha, 60-90 16 kgN/ha
Total N/ha applied	239 kgN/ha	230 kgN/ha	227 kgN/ha
Drill Date	04/10/18	20/10/18	10/10/18
Seed Rate	400 seeds/m <sup>2</sup>	350 seeds/m <sup>2</sup>	400 seeds/m <sup>2</sup>
Drilled Plot Dimensions	2m x 12m	2m x 12m	2m x 12m
Replicates	3	3	3
Harvest Date	12/08/19	22/08/19	06/08/19

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