



Staunton

Long term establishment & black-grass control project

Christine Lilly

- 
- **2010**
 - **Established using the host farm or local equipment**
 - **0.5 ha in size.**
 - **Not been ploughed for at least 10 years, cultivation strategy based around non inversion tillage.**
 - **Cropping history - wheat/osr rotation with no spring crops.**
 - **High population of black-grass (up to 500 heads m²) - impacting yields.**
 - **Heavy Nottinghamshire clay - prone to waterlogging in winter.**
 - **Host farmer tried a number of different methods for controlling black-grass including laying fields down to haylage for up to 5 years**

Black-grass heads m² 2012 - 2017

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016	Year 6 2017	Notes	'12	'13	'14	'15	'16	'17
1	Plough WW	Plough OSR	Plough WW	Plough WW full and partial	Plough w osr full and partial	Plough w wheat full	Continuous Plough - Invert soil every year						
2	Plough WW	Non Inversion OSR	Non Inversion WW	Plough WW Full and partial	Non inversion w osr	Non Inversion WW	Rotational plough						
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4													
5													
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7													
8													
9													
10													

Head counts have been meaned across split plots in some cases for early years. For 2015 & 2016 block 1,2 figures are for Kverneland and farm plough techniques.

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3	Non Inversion WW	Non Inversion OSR	Non Inversion WW	Plough full Inversion SW	Non inversion w osr/ Winter fallow spring osr	Winter fallow spring barley	Winter crops then switched to spring cropping						
4	Overwinter fallow SW	Overwinter fallow S OSR	Overwinter fallow SW	Non inversion WW	Non inversion w osr	Non inversion ww	Overwinter fallow and Spring Cropping. Returned to WW in 2015						
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5	Non Inversion WW	Non Inversion OSR	Non Inversion WW (silaged)	Plough Spring wheat/fallow	Winter fallow both halves then s osr	Non Inversion WW	Original early drilled, 2 seed rates. Poor control. Silage, plough, SW or fallow in 2015. Spring osr 2016, ww '17						
6	Non Inversion WW	Non Inversion OSR	Non Inversion WW	Non inversion SB Non inversion cover crop - SB	Non inversion fallow then s osr Non inversion cover crop - s osr	Non inversion fallow or cover crop. Then s barley	Cover crops. Changed to SB in 2015, s osr 2016, s barley 2017						
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7	Direct Drill WW	Direct drill OSR	Direct drill SW	Direct drill WW	Direct drill w osr	Direct drill spring barley	Low soil disturbance						
8	12 month fallow	Non Inversion WW	12 month fallow	Non inversion WW	12 month fallow	Non inversion ww	Min till & 12 month managed fallow						
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8	12 month fallow	Non Inversion WW	12 month fallow	Non inversion WW	12 month fallow	Non inversion ww	Min till & 12 month managed fallow						
9	Non Inversion WW	Non Inversion OSR	WRye – (silaged) WW – (silaged)	W rye/W wheat (silaged)	W rye (silaged)/ W osr	Autumn grass ley	3 years of removing seed/ 2 years removing seed						
10	Non Inversion WW	Non Inversion OSR	Non Inversion WW	Non inversion WW	Non inversion w osr.	Nov drill wheat	Late drilled						

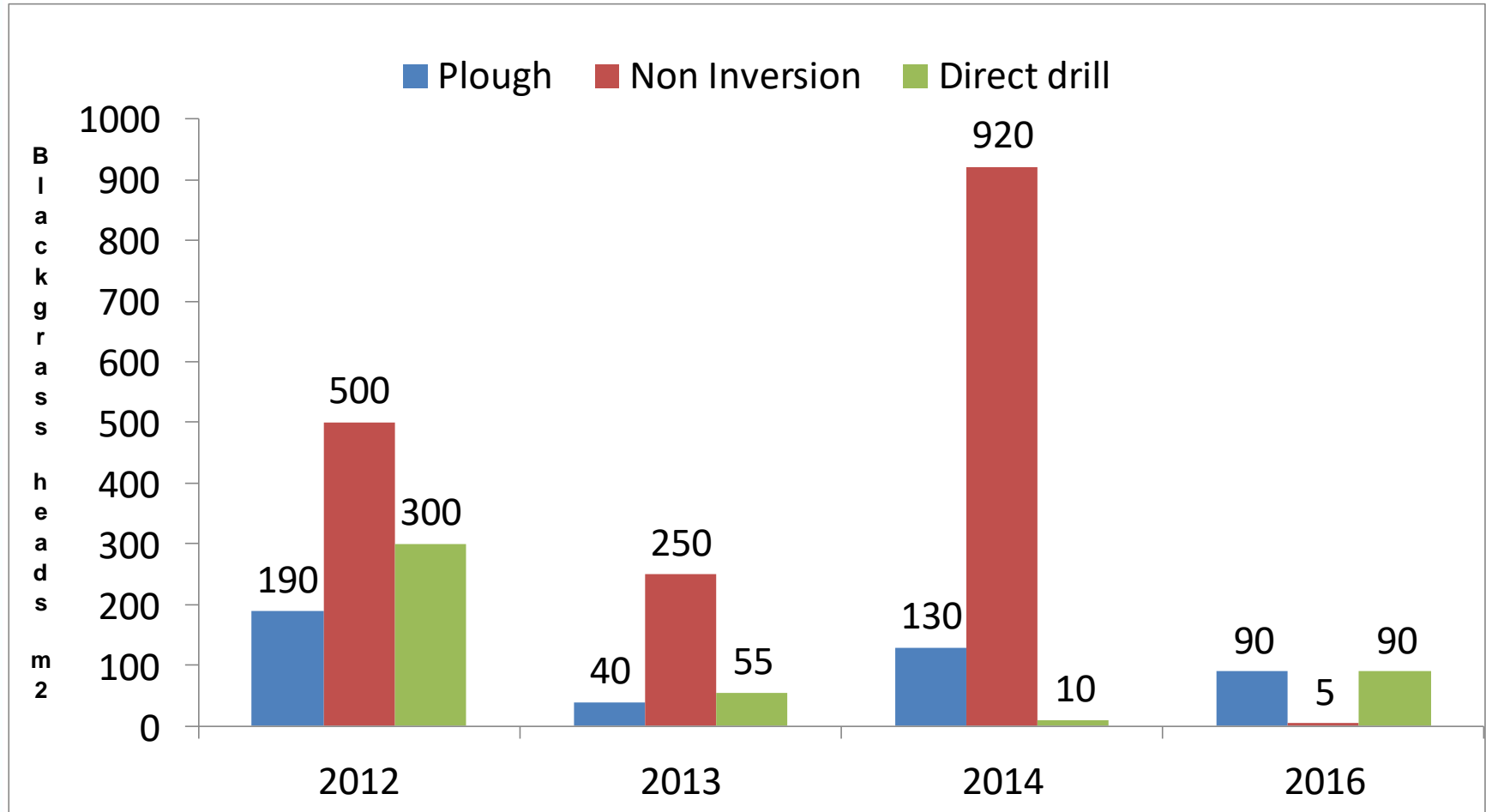
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1	Plough WW	Plough OSR	Plough WW	Plough WW full and partial	Plough w osr full and partial	Plough w wheat full	Continuous Plough - Invert soil every year	190	40	130	5,15	100,80	30
2	Plough WW	Non Inversion OSR	Non Inversion WW	Plough WW Full and partial	Non inversion w osr	Non Inversion WW	Rotational plough	200	95	490	10, 7	5,5	1
3	Non Inversion WW	Non Inversion OSR	Non Inversion WW	Plough full Inversion SW	Non inversion w osr/ Winter fallow spring osr	Winter fallow spring barley	Winter crops then switched to spring cropping	500	150	485	3	80 w, 10s	0,0
4	Overwinter fallow SW	Overwinter fallow S OSR	Overwinter fallow SW	Non inversion WW	Non inversion w osr	Non inversion ww	Overwinter fallow and Spring Cropping. Returned to WW in 2015	6	6	6	3	2	3
5	Non Inversion WW	Non Inversion OSR	Non Inversion WW (silaged)	Plough Spring wheat/fallow	Winter fallow both halves then s osr	Non Inversion WW	Original early drilled, 2 seed rates. Poor control. Silage, plough, SW or fallow in 2015. Spring osr 2016, ww '17	500	250	920	2	0,0	0,0
6	Non Inversion WW	Non Inversion OSR	Non Inversion WW	Non inversion SB Non inversion cover crop - SB	Non inversion fallow then s osr Non inversion cover crop - s osr	Non inversion fallow or cover crop. Then s barley	Cover crops. Changed to SB in 2015, s osr 2016, s barley 2017	220	140	600	20,12	150cc, 30f	1,1
7	Direct Drill WW	Direct drill OSR	Direct drill SW	Direct drill WW	Direct drill w osr	Direct drill spring barley	Low soil disturbance	300	55	10	50	90	5
8	12 month fallow	Non Inversion WW	12 month fallow	Non inversion WW	12 month fallow	Non inversion ww	Min till & 12 month managed fallow	0	10	0	0	0	0
9	Non Inversion WW	Non Inversion OSR	WRye – (silaged) WW – (silaged)	W rye/W wheat (silaged)	W rye (silaged)/ W osr	Autumn grass ley	3 years of removing seed/ 2 years removing seed	-	-	75	5	180rye, 25osr	200 rye 75 osr
10	Non Inversion WW	Non Inversion OSR	Non Inversion WW	Non inversion WW	Non inversion w osr.	Nov drill wheat	Late drilled	-	-	-	-	-	1

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Inversion V Non Inversion V direct drill



Ploughing

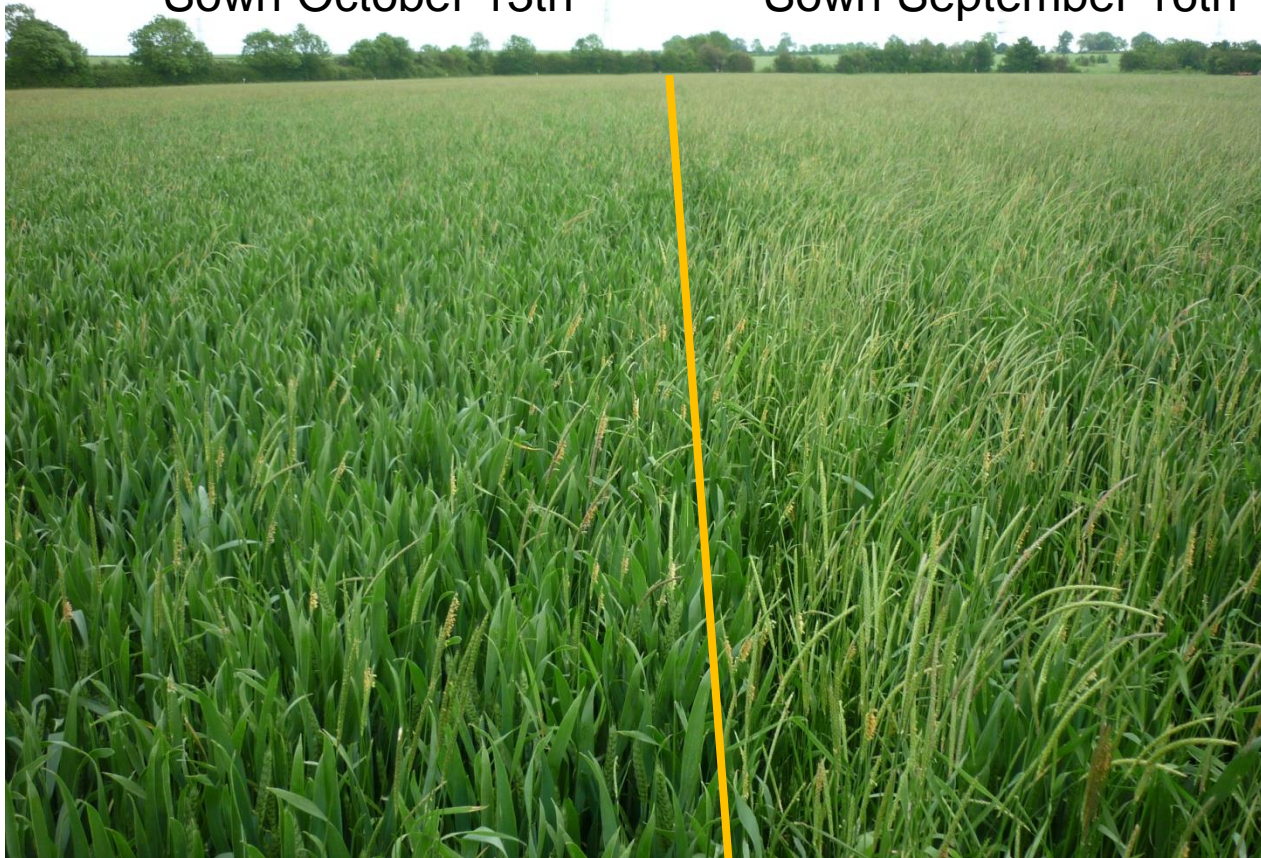


Staunton – Delayed drilling



Sown October 13th

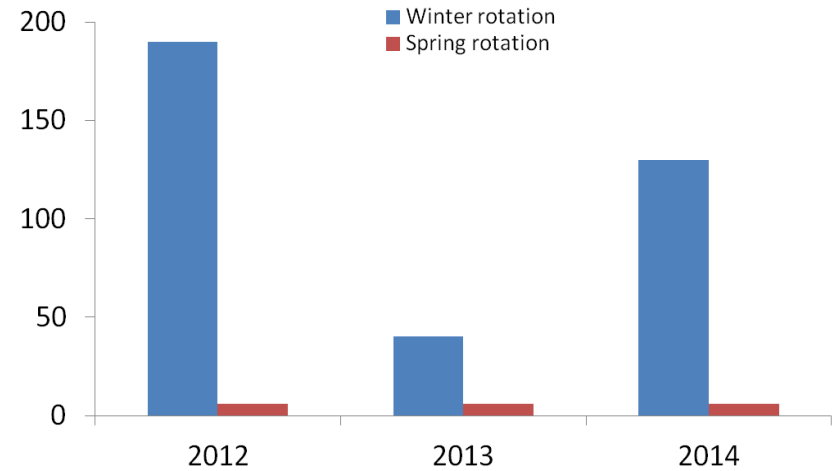
Sown September 16th



220 Heads m/2

500 Heads m/2

Winter cropping V overwinter fallow and spring cropping



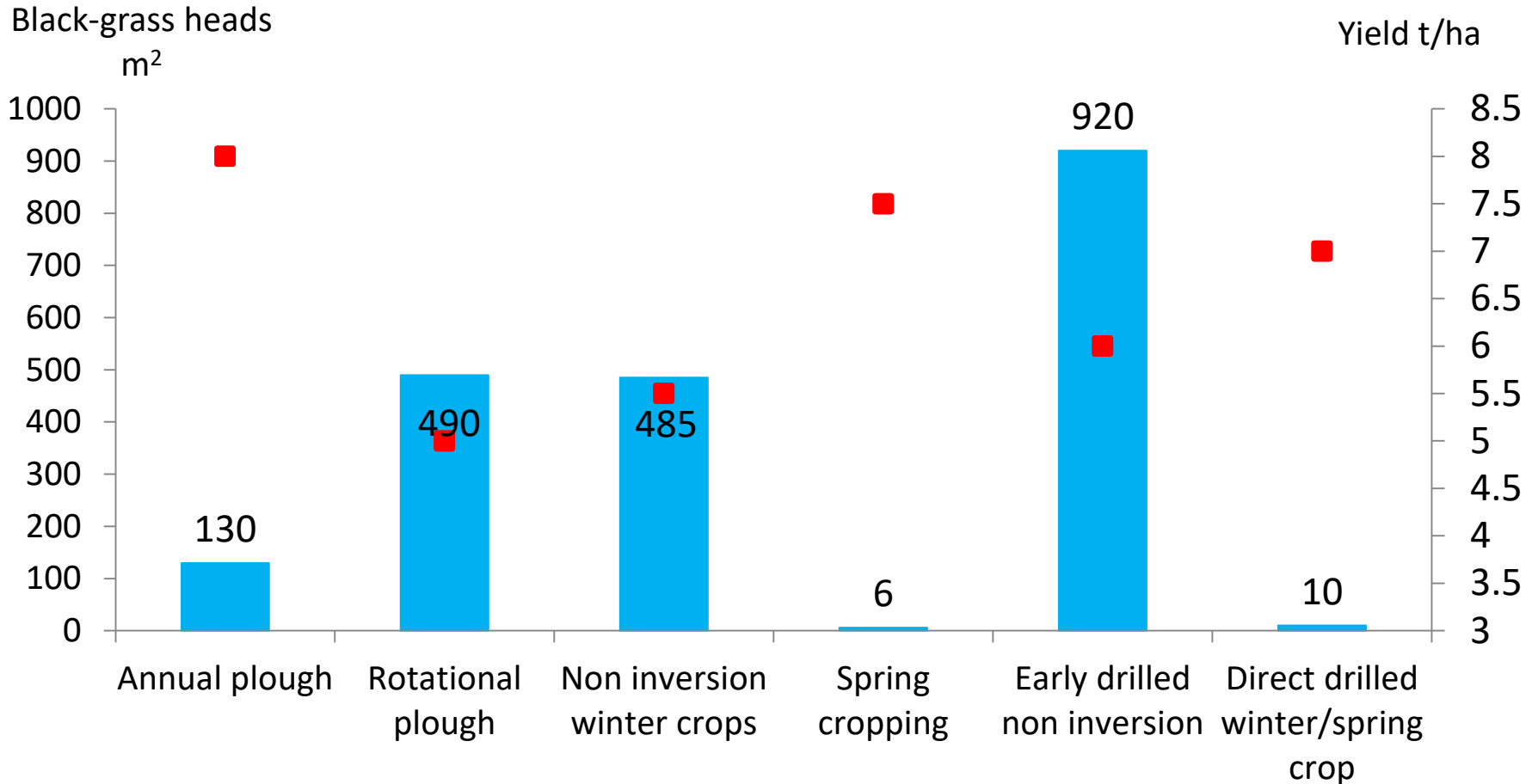
Two extremes - non inversion early drilled compared to ploughing followed by spring wheat (500 v 6 heads m²).

Spring cropping

- Challenge of spring cropping on a heavy land site
- Spring barley, spring wheat and spring oil seed rape.
- Cereal crops have been easier to establish.
- One very successful season with spring osr in 2012 the 2016 crop suffered high levels of pollen beetle damage.



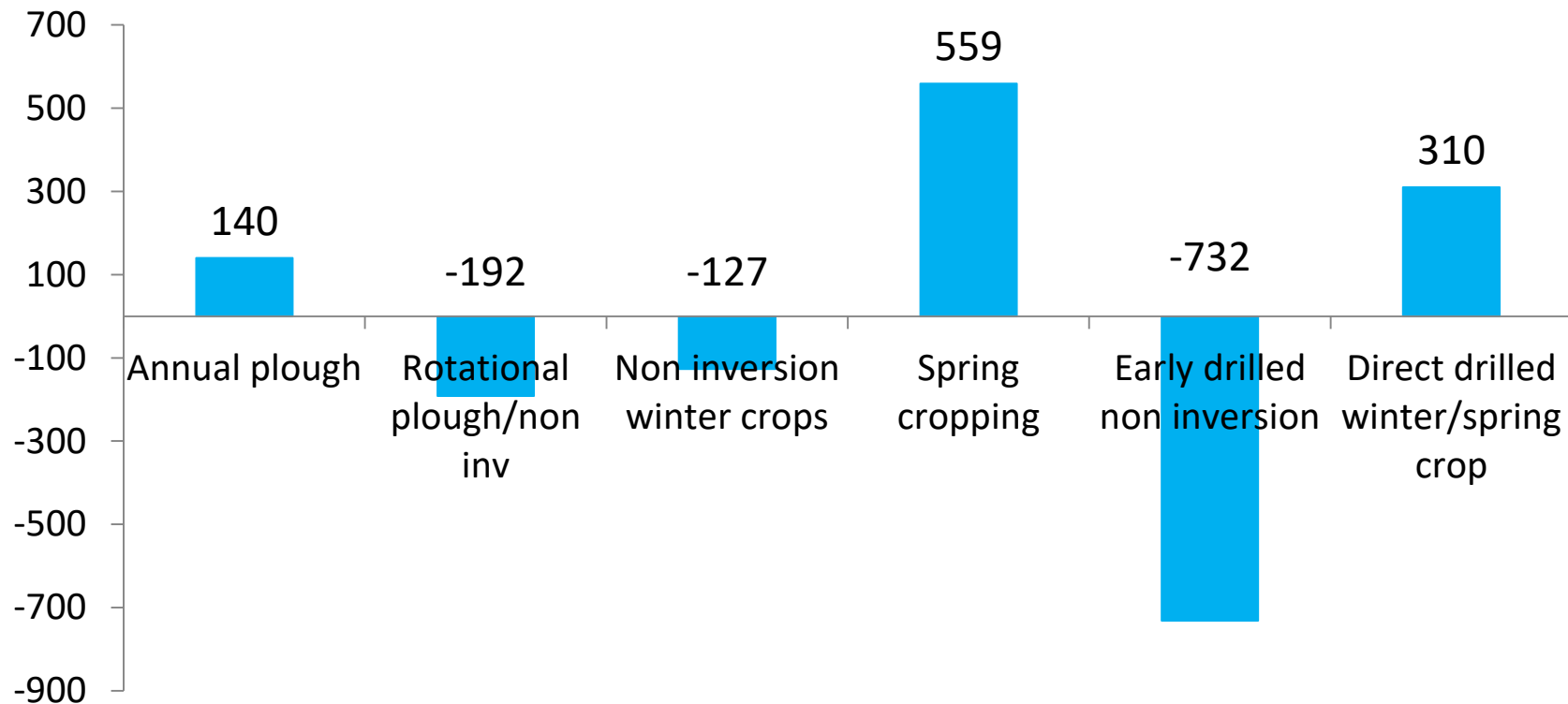
Black-grass heads m² & Yields t/ha 2014 (winter or spring wheat)



Margins £/ha 2014

(includes establishment, workings, inputs)

(winter or spring wheat)



Attention to detail

**Black-grass growing where
crop thin**



Alternate winter wheat/ fallow rotations

- Successful.
- High yielding crop.
- Financial penalty during uncropped year



Whole crop removal

- Rye (Mephisto) established well, quick to grow away in the spring than the winter wheat.
- In the first two seasons the rye crops were more competitive than wheat
- Rye plots similar number of black-grass plants to the winter wheat.
- Rye - black-grass plants had smaller ears with fewer grains.
- Rye was taller and thicker than the wheat.





Black-grass growing in lines from seed loss following silaging of previous crop and baling

- In year 3 (rye crop now in its third rotation) shorter and with a more open canopy.
- Open nature of the crop allowed black-grass to tiller profusely.
- Compromise on ideal harvest date
- Block was split in autumn 2015 – rye or w osr.
- Final head counts were 180 m² in the rye and 25 m² in the winter osr.

Cover Cropping

Black-grass and thin spring osr crop
after oil radish



Better established spring osr crop
after over winter fallow



Other methods- ryegrass ley Introduced autumn 2017



So what can a grower do & how has the host farmer reacted?



- Change nothing?
- The project has demonstrated to growers that all is not lost.
- Host farmer - 50% of cereals now spring cropping.
- Host farmer doesn't start until at least Mid October.
- Ploughing has been successful at Staunton combined with spring crop.
- Alternate wheat/fallow - Worth a try on some fields.
- Grow for AD.
- Grass leys.