

FIG Report: Oilseed Rape Cross Drilling 2019

FIG members

Participating Farmers:

Richard Wainwright, North Yorkshire

Mark Stubbs, Lincolnshire

Charlie Steer, Cheshire

ADAS Facilitator & Technical lead:

Sarah Kendall

Technical Support: Catriona Walker & Tom Bennett

(University of Leeds)

The Concept & Hypothesis

This FIG was formed at a YEN Ideas Lab held in June 2018 in which farmers and researchers met to discuss yield enhancing ideas that could be tested on farm. The group were interested in precision drilling of oilseed rape (OSR) & understanding whether plant spacing could be further optimised for yield enhancement (Fig. 1).



Fig. 1 YEN Ideas Lab, Newark, June 2018, with the OSR group in the foreground.

It is well understood that a canopy size of ~3.5 GAI units at flowering tends to maximise yields of OSR. Cross drilling, whereby most plants should have a greater distance to their nearest neighbour, was proposed as a practical means of testing whether the current practice of drilling OSR in parallel rows may be compromising individual plant productivity i.e. cross-drilling might help to optimise canopy size, and maximise branching, hence enhance yields.

The aim of the trials was to generate a better understanding of the benefit of optimising plant spacing for OSR. It was not expected that commercially, cross drilling in OSR would be viable, but it was felt that this work might highlight ways in which establishment of OSR might be improved, so contributing to improved yields. So this FIG's hypothesis was that optimised plant spacing in OSR would improve yields through establishing an open canopy structure which will maximise light interception and increase seed number.

The approach

Each farmer established a 'cross drilled' area of their chosen field in autumn 2018, in which 50% of their standard seed rate was drilled in one direction and 50% at right angles. The FIG visited the North Yorkshire site in February 2019 and March 2019 to inspect and discuss the two drilling treatments (Figs. 2 & 3).



Fig. 2 Oblique and overhead images of conventional (straight) and cross-drilled (cross) areas of oilseed rape the North Yorkshire site in March 2019.



Fig. 3. OSR Cross-Drilling FIG discussions during the field visit to the North Yorkshire site in Feb 2019.

Progress of the trial was monitored throughout the season using NDVI imagery. Seed yields were measured at harvest, and outcomes for each treatment were compared using Agronomics analysis.

The Results

There were no differences in plant establishment between the two drilling treatments (Table 1). The effects of cross drilling on seed yield are shown in Table 2. Grab samples of the crop were taken from the North Yorkshire site and indicated that the improvement in yield at this site was due to an increased number of seeds/m², plus a smaller increase in thousand seed weight.

The different yield responses across the three trials seems likely to be due, at least in part, to the different row spacing used in the Farm Standard treatment. Positive responses (1 statistically significant) were obtained with 50cm row spacing, whereas the negative response was obtained where the row spacing was much narrower (12.5cm) and the plant density greater.

Table 1. Effect of drilling treatments on plant population.

	Seed rate (seeds/m ²)	Row width (cm)	Average plant density, plants/m ²	
			Farm Standard	Cross-drilled
Site 1, North Yorks.	30	50	13	16
Site 2, Lincs	45	50	34	34
Site 3, Cheshire	83	12.5	41	41

Table 2. Effect of drilling treatments on seed yield.

	Farm Standard Yield (t/ha)	Modelled yield difference of cross drilling to the farm standard (t/ha, +/- standard error)	Yield difference for 95% confidence, (t/ha)
Site 1, North Yorks	4.63	+1.10 ± 0.12*	0.24
Site 2, Lincs	3.40	+0.22 ± 0.12	0.23
Site 3, Cheshire	4.61	-0.98 ± 0.37*	0.72

* this difference is significant at the 95% confidence level

Discussion & Conclusions

The data from these three trials showed a range of yield responses to cross drilling, from negative to markedly positive. This information has been interpreted as indicating whether row spacing with the Farm Standard practice of parallel rows might be sub-optimal. It appears that 50cm row spacing could be too wide in some situations, and therefore, cross drilling had a positive effect. It also provided evidence to suggest that optimising plant spacing is important for OSR, and future developments in precision drilling of this crop could help to enhance yields.

Although this FIG only had members from three farms, it also included members from the local University (Leeds) who helped making crop assessments; overall the FIG operated very well, with much discussion in a WhatsApp group. The FIG's work was highlighted in a BBC Farming Today programme, with the presenter jointly interviewing the lead farmer and the ADAS facilitator.