INTRODUCTION
Within northern temperate regions, the main limiting resource for plants is usually light, and studies have shown that shading has reduced yields in temperate agroforestry systems. The impact of trees on crop yields has also been identified by arable farmers as a key management challenge of silvoarable agroforestry (Smith et al., 2014). One approach to developing agroforestry-adapted crops is the use of evolutionary plant breeding to develop Composite Cross Populations (CCPs) that are particularly well adapted to growing in close proximity to trees.

Wheat Composite Cross Populations are created by crossing several varieties and developed by iterative natural selection on-farm and characterised by very high genetic diversity in the field (Fig. 1).

METHODS
Site: Wakelyns Agroforestry organic silvoarable system, 10m alleys with hazel SRC, East Anglia, UK
Year: 2015
Field trial set up: 3 replicates, replicated cross-over design
Plot size: 1.2m by 10.2m
Entries:
• East of trees population (EOT);
• West of trees population (WOT);
• Centre of alley population (COA)
Assessments: grain yield (t/ha); hectolitre weight (g); thousand grain weight (TGW).

RESULTS
• Significant effect of location on yield and hectolitre weight, with crop yields at the edges of the alleys roughly half what they were in the centre of the alley (Fig. 3)
• No significant difference between different populations for any of the yield parameters
• No significant interactions between the populations and their locations.

CONCLUSIONS
• No major interactions between populations and location suggests that, in this first year, there is no evidence of adaptation to alley location.
• It may be necessary to carry out more detailed selection of high performing individual plants by hand, which are then bulked up, to develop specific ‘alley edge’ populations for agroforestry.

REFERENCES

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