

# Cover crops and intercropping enable input reduction and maintained yields of subsequent sole crops in an organic arable cropping system

Iman Raj Chongtham and Georg Carlsson

## CONCLUSION

**Similar yield levels despite lower fertilization indicate that crop diversification with legume cover crops and intercrops generate benefits to the entire cropping system.**

**Possible causes of larger yield variations in diversified systems need to be further investigated.**

## INTRODUCTION

Crop diversification through crop rotation, intercropping and cover crops can promote ecosystem services such as pollination, biological pest control, nutrient retention and soil fertility<sup>1,2</sup>.

Less is known about long-term legacy effects of cover crops and intercropping on subsequent crops in the rotation<sup>3</sup>.

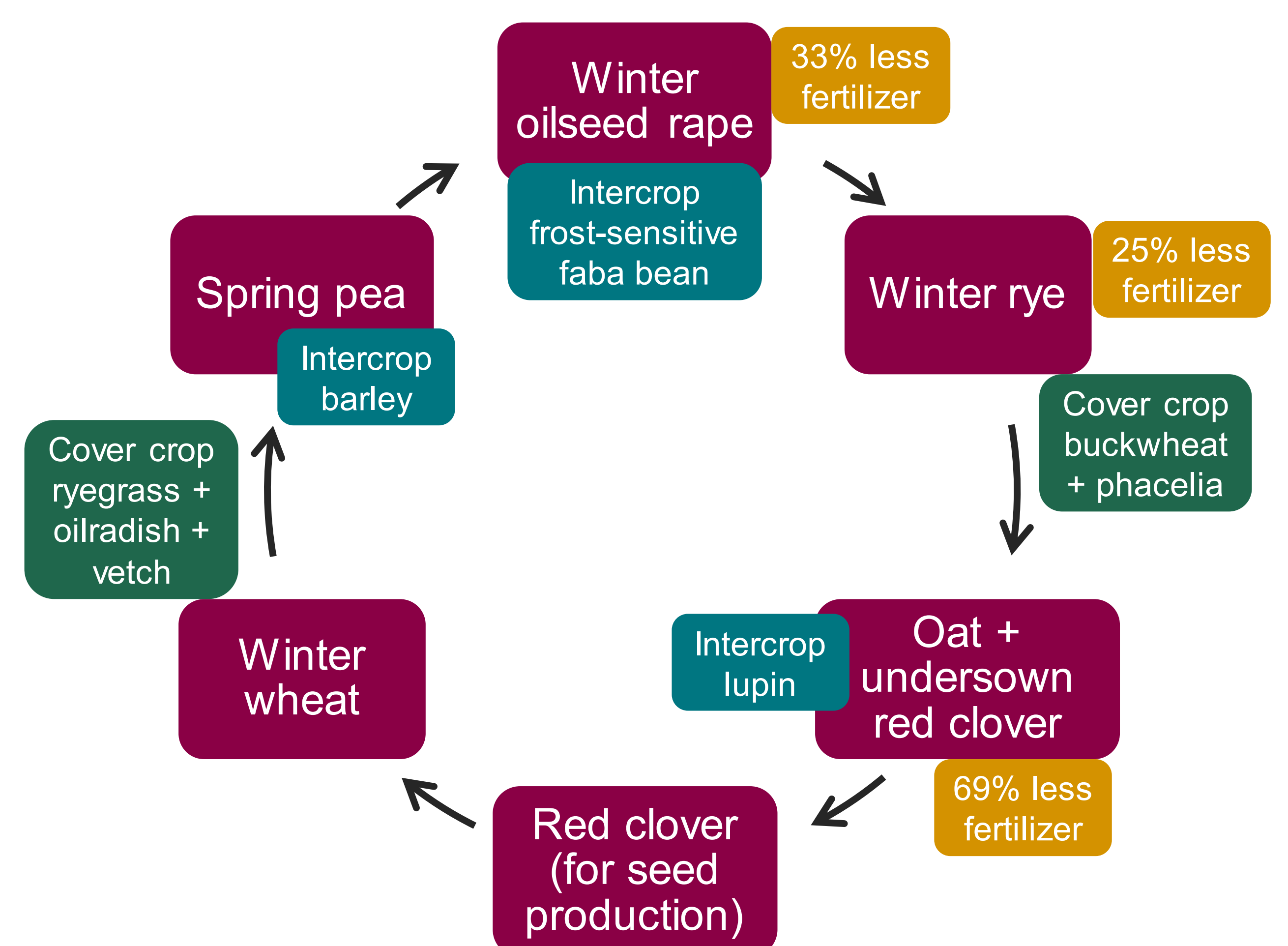
## MATERIAL AND METHODS

A crop rotation field experiment in organic management was used to investigate effects of cover crops and intercropping on grain yields, yield variations and weed biomass in sole crops of the same rotations (Fig. 1).

The diversified rotation included more legumes, and therefore received less fertilizers (Fig. 1).

Fig. 1. Illustration of the studied crop rotations, with the six main crops of both rotations in red boxes. The diversified rotation differ from the reference by the addition of cover crops (green boxes) and intercrops (blue boxes), and lower fertilizer inputs (yellow boxes).

The experiment is located in Alnarp, southern Sweden. Each crop is present every year in the experiment, in plots measuring 6 x 12 m, randomly distributed in 4 blocks.



## RESULTS

No significant difference in grain yield or weed biomass was found for any of the studied crops; winter rye (Fig. 2), winter wheat (Fig. 3) or red clover (not shown).

Yield variations over the five years, measured by the coefficient of variation, were higher in the diversified rotation than in the reference for winter rye and red clover.

Total soil carbon and nitrogen contents after five years were slightly (not significant) higher in the diversified rotation.

The experiment is ongoing and available as a platform for further research, e.g. on above- and below-ground biodiversity and long-term soil fertility.

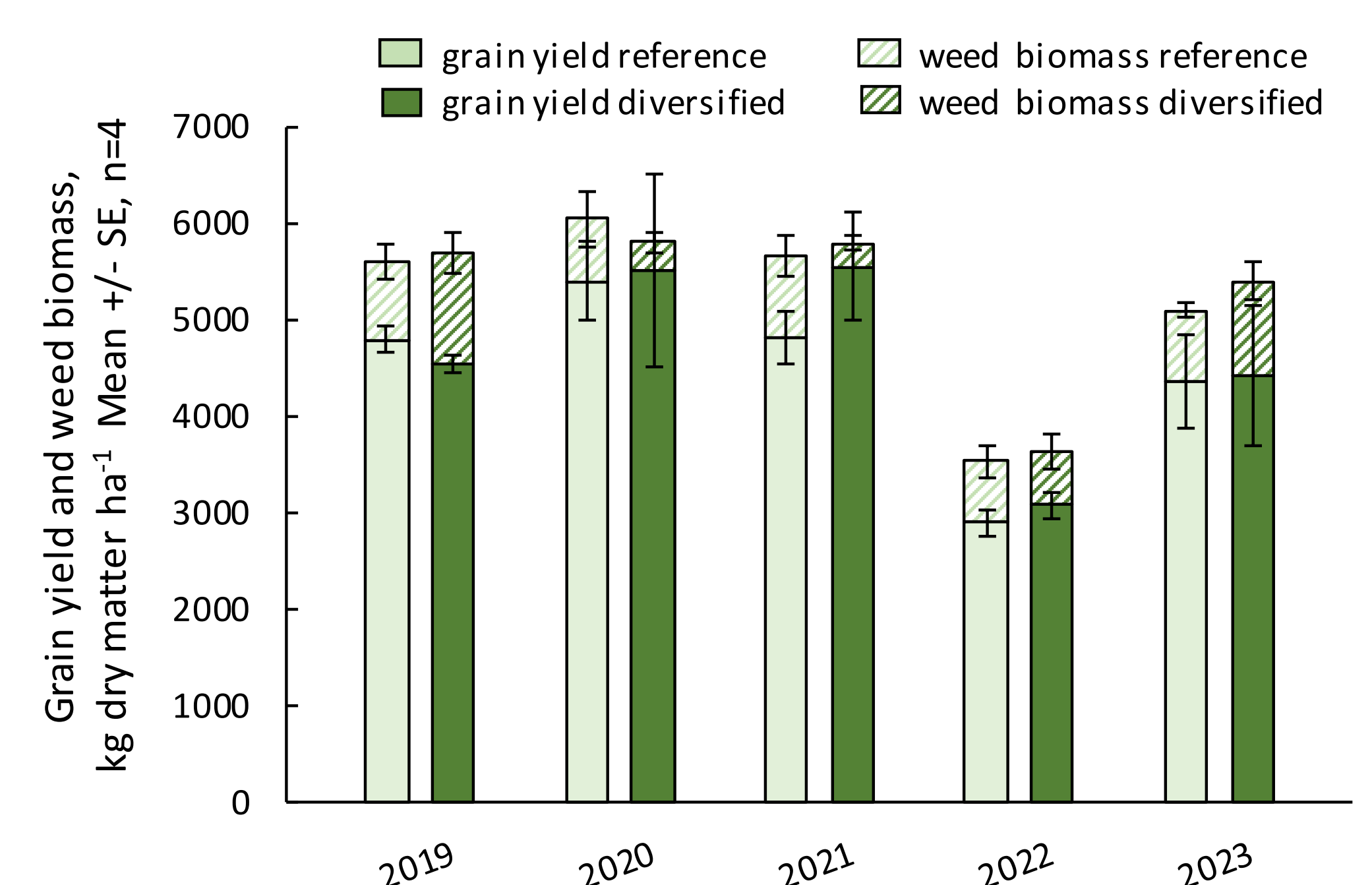


Fig. 2. Grain yield (filled bars) and weed biomass (hatched bars) in winter rye in the reference (light green) and diversified (dark green) rotations.

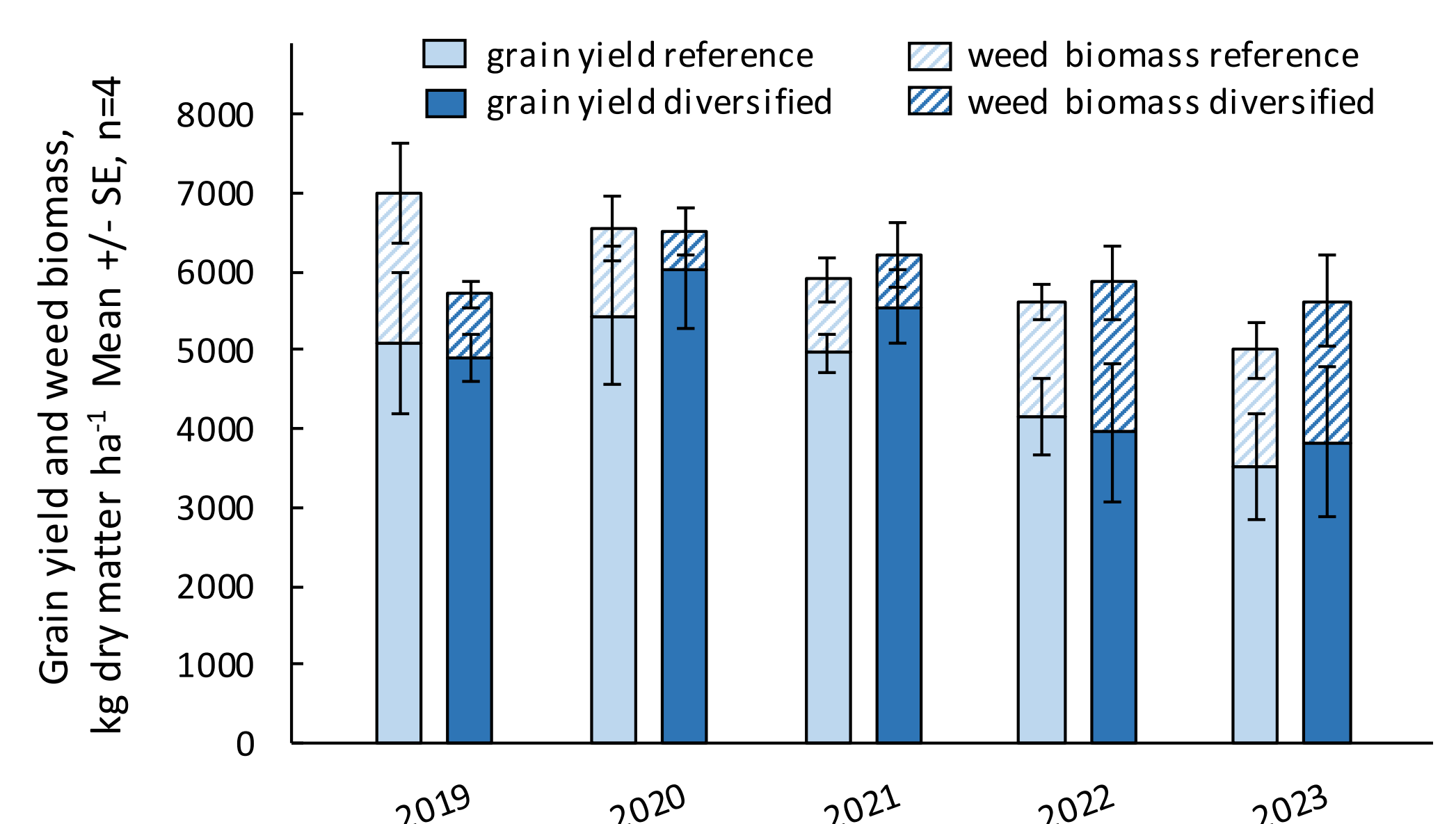


Fig. 3. Grain yield (filled bars) and weed biomass (hatched bars) in winter wheat in the reference (light blue) and diversified (dark blue) rotations.

Poster ID: 295