Legumes increase brassica yields in low-input systems

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Results

Cereal/legume intercrops often give Land Equivalent Ratios greater than 1 (Corre-Hellou et al., 2007). Such a result may be due to niche separation and/or nutrient transfers between species (Jensen, 1996; Paynel and Cliquet, 2003). Brassica/legume intercrops are still poorly documented.

Our aims were:
1) to compare the development of brassica forages grown either in monoculture, or with a grain legume,
2) to quantify nitrogen transfer from legumes to brassicas.

Material and methods

Plants were sown in rhizotrons. Two intercrops were studied: Brassica napus grown with Vicia faba ssp. minor and B. oleracea with V. sativa. They were compared to monospecific rhizotrons sown with B. napus or B. oleracea. Legumes were 15N-labelled. Root development was daily recorded. After harvest, above ground parts were prepared for 15N:14N measurements.

Background and aims

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Results

Legume and brassica roots explored different parts of the rhizotrons (Fig. 1)
Biological N fixation reached 66 to 82% of the legume N.
About 8% of the total N of intercropped B. oleracea came from vetch, and about 12% of intercropped B. napus total N came from faba bean.
Dry weights and N contents of brassicas were higher in intercrops than in monospecific rhizotrons (Tab. 1)

Conclusion

Yield and N content of Brassica cultivars were significantly higher when they were grown with a legume than in monospecific rhizotrons. Three weeks of 15N labelling in the early growth were sufficient to reveal N transfer from grain legumes to brassicas.

References