

Complementary **root systems** in organic intercropping of vegetables

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AIM

Leek has a shallow root system which lacks of the ability to absorb nitrogen in deep soil layers. The aim of this project was to grow leek with a catch crop at the same time (intercropping) to build complementary root systems in the soil to reduce nitrate leaching. We hypothesized a) the two crops will grow complementary root systems in the soil and b) the yield of leek will be similar in the sole cropping and intercropping systems.



METHODS

The leek cultivar, Hannibal, was intercropped with dyers woad (in Danish: Farve vajt) by replacing every third row of leek with a row of dyers woad. Minirhizotrons (transparent tubes) were used to observe root growth to 2.4 m depth in the soil.

RESULTS

The first year results showed that the intercropping system had a much deeper root distribution which reached beyond the depth of 1.5 m in leek rows at the end of growing season, compared to the sole-cropped system which reached 0.6m (Fig. 1). At the same time, the intercropped system had a higher root density in the shallow soil layers due to the presence of the dyers woad. The marketable yields of two cropping systems were similar when calculated per meter row.

CONCLUSION

The deep root system of dyers woad complemented the shallow root system of leek without jeopardizing leek yields. These results show perspectives for reduction of nitrate leaching from leek production.

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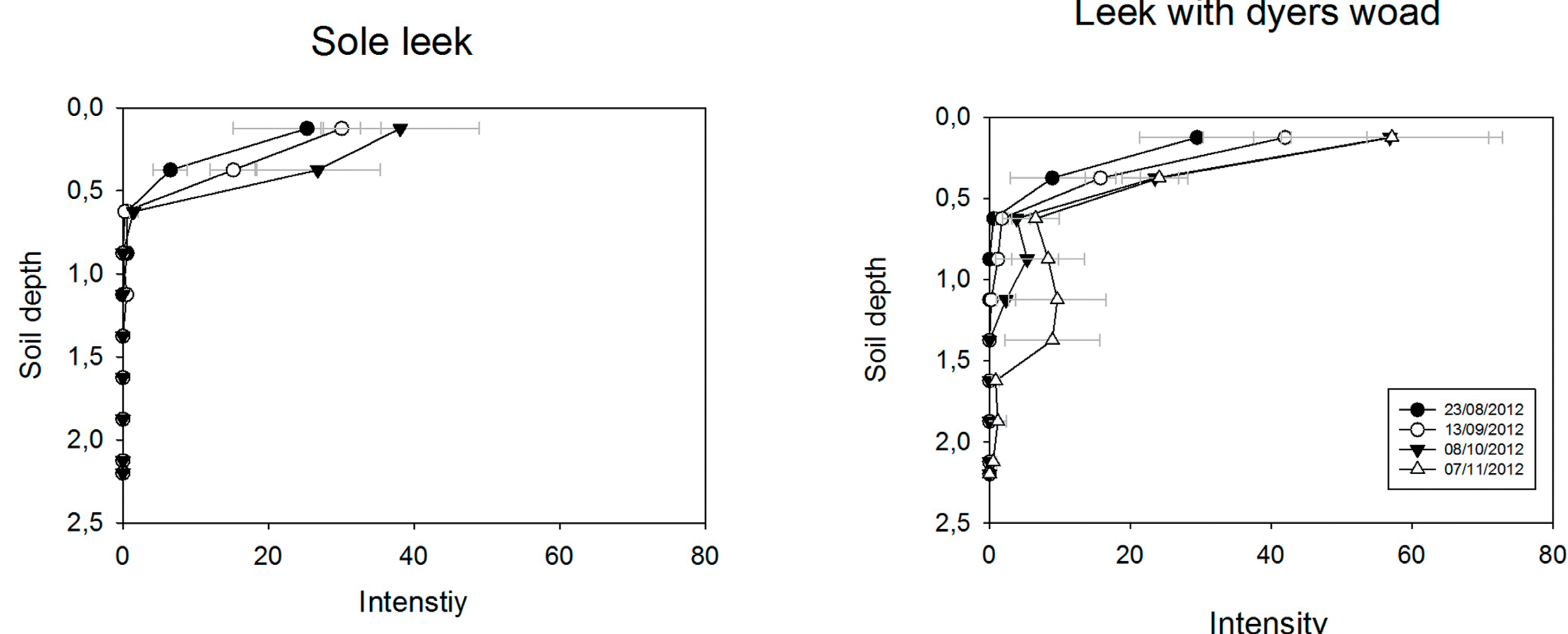


Figure 1. The development of root density under sole cropped leek and leek intercropped with dyers woad during the autumn season.

