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PEAS (PISUM SATIVUM) OR OAT (AVENA SATIVA) - WHAT FITS BETTER WITH LENTIL (LENS CULINARIS) IN MIXED CROPPING?

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Due to lodging, pure lentils (*Lens culinaris* Medik.) often are difficult to harvest with a combine. The pods are near the soil surface and as a consequence either pods remain on the field which reduces the already low yield level and soil and stones are accidentally collected which makes additional cleaning processes necessary. Therefore in practice lentils often are cultivated with companion crops, which prevent lentils from lodging and help to suppress weeds. Up to now lentils are mainly grown together with cereals in practice because of its good weed suppressing ability.

Mixed cropping of lentil with pea (*Pisum sativum* L.) or oat (*Avena sativa* L.) was compared with monocropping of all three crops in Zurich (Switzerland) from 2016 to 2018. Besides the sole cropping, three mixing ratios (1:3, 1:1 and 3:1) were investigated. The objective of the study was to find out, which of the two companion crops and which mixing ratio are the most suited for the cultivation of lentils in terms of different parameters like lodging, yield, protein content or protein yield.

Lodging of lentils was highest in sole crop and decreased in the mixtures with decreasing proportion. However, the effect of the companion crop was not consistent: lentils lodged more with oat as companion crop in 2017 while in 2018 lodging of lentils was more pronounced when grown together with peas. Although the land equivalent ratio (LER) of the yield increased in the mixed cropping (> 1.04), the differences were not significant - neither between the different ratios nor between the companion crops investigated. The thousand kernel weight (TKW) of oat was neither influenced by the year nor the mixing ratio, unlike to the legumes.

Independent of the proportion of lentils in the lentil-pea-mixture, the protein content of the peas remained the same and the lentil-oat-mixture always had a significantly lower protein yield (6.3 dt/ha) compared to the lentil-pea-mixture (10.7 dt/ha) except of the lentil-pea-mixtures with the ratios 1:1 and 3:1 in 2018. Additionally, with increasing proportion of peas in the mixture, the protein yield increased significantly and achieved 12.0 dt/ha in pure peas. As lodging of lentils in lentil-pea-mixture was not worse compared to a lentil-oat-mixture but protein yield was increased, this cropping system could be an interesting option to increase the production of regional proteins - either for humans or animals.

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