

Legume Futures Press Release

Often profitable: Grain legumes in cropping systems

Müncheberg, Germany. 17 March 2015

Crops of beans, peas and lupins can be profitably integrated into farming systems. This is the finding of Legume Futures research published in a recent paper in Field Crops Research by scientists at the Leibniz Centre for Agricultural Landscape Research (ZALF) in Germany.

Within the European research project Legume Futures, scientists at the Leibniz Centre for Agricultural Landscape Research (ZALF) have just published the results of an analysis of the effects of grain legumes on the profitability of arable cropping systems. Sara Preissel and her colleagues conclude that the beneficial effects of legumes on soil fertility and especially on the yield of subsequent cereal crops are a large component of the economic effects of grain legume crops in farming systems. Better appreciation of these effects are required if grain legume use is to be optimised.

Simple crop gross margin calculations that are commonly used in crop planning usually under-estimate the contribution of grain legume crops to farm revenue. This has contributed to the decline in grain legume production in Europe with negative consequences for the environmental performance of farming systems. The ZALF researchers have conducted a detailed analysis of 19 economic studies and conclude that assessing gross margins for crop rotations rather than just individual crops often improves the assessment of grain legumes. With this broader approach, 35 of the 53 assessments reviewed show that the inclusion of grain legumes in the rotation had a positive or neutral effect. Following an analysis of 29 crop rotation experiments conducted in Europe, the cereal crops grown after grain legumes are higher yielding (0.5 - 1.6 t/ha) than after cereal



crops. This 'pre-crop' effect on cereal crops grown after legumes is slightly larger than that of other broad-leaved crops such as oilseed rape or sunflower. However, there is an additional well-known effect of legumes in reducing the need for fertiliser nitrogen.

Other whole-farm effects are important. Including spring-sown grain legumes in rotations dominated by autumn-sown crops gives a more even work flow through the year on the farm. Reduced cultivations are more easily adopted after grain legumes reducing time and energy required for tillage, up to enabling no-till cultivation for the subsequent crop. The review identified the resultant reductions in machinery costs as an important component of farm-level economic effects in some studies.

Dr Peter Zander, who leads the economic research in Legume Futures: "Our research has gone beyond traditional gross margin analysis to give a more holistic assessment of the effects of including grain legumes on farm revenues. This holistic approach substantially increases the number of situations where legume-supported rotations are assessed as competitive compared with other cropping options, including other break crops".

Author Sara Preissel: "The rotational effect of grain legumes has been the subject of research in Europe. Bringing together the results of these experiments shows the full extent of the economic effects. The research also shows that optimising the economic effect requires careful selection by the farmer of the crop species in relation to the site and the farming system used".

Prof. Christine Watson of the SRUC in Scotland reflects on the wider crop development context: "The ZALF team have skilfully focused on the whole-farm economic effects of more diverse rotations that use legumes linked directly to crop sales. If we combine these on-farm effects with public incentives for non-market benefits such as environmental benefits then the prospects for a revival in grain legume production are good. We still need progress in crop breeding combined with skilled local development of cropping systems".

The research is published in the academic journal Field Crops Research. The paper is:

Magnitude and farm-economic value of grain legume pre-crop benefits in Europe: a review. Field Crops Research 175 (2015) 64-79. Authors: Sara Preissel, Moritz Reckling, Nicole Schläfke and Peter Zander.

The research paper is freely available here:

[Press release: Grain legume crops are economically competitive in many European cropping systems](#)

<http://authors.elsevier.com/sd/article/S0378429015000301>

Legume Futures

Legume-supported cropping systems for Europe (Legume Futures) is an international research project funded by the European Union through the Framework 7 Programme (FP7) under grant agreement number 245216 (FP7-KBBE-2009-3). The Legume Futures research consortium comprises 20 partners in 13 countries.

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