

# Evaluation of seed ingredients of *Lupinus angustifolius* for the application in food industry

Helene Beyer, Gisela Jansen, Hans-Ulrich Jürgens and Frank Ordon  
Julius Kühn-Institut, Institute of Resistance Research and Stress Tolerance, Quedlinburg  
Email of corresponding author: helene.beyer@jki.bund.de

In contrast to most crop species, the narrow leafed lupin (*Lupinus angustifolius*) is a very recently domesticated crop. Lupins were first introduced in Germany in 1781 in order to improve the poor sandy soils of Northern Germany. Systematic breeding was initiated in Germany at the beginning of the twentieth century and accelerated in the 1990s with a focus on reducing alkaloid levels, pod dehiscence and improved seed yield.

The seeds of narrow leafed lupins contain high amounts of protein, oil and fibre. Despite their valuable seed composition, the acreage in Germany is still quite limited as well as their use in food industry. To improve the cultivation of *L. angustifolius*, the seed composition, environmental stability and heritability of important seed ingredients, which might be beneficial for lupin breeders as well as end users of sweet narrow leafed lupins, were estimated.

To achieve this, field trials with 50 genotypes of narrow leafed lupins were

carried out in four different locations with two replications, over three years.

The examined seed ingredients comprise content of crude protein, oil, non-starch polysaccharides, raffinose oligosaccharides and alkaloids as well as the composition of amino acids and fatty acids.

The determination of the relative contribution of the genotype and environment to the variation in seed quality traits revealed little genotype x environment interaction in comparison to the influence of the genotype solely, resulting in a quite high heritability for all traits analysed.

The genotypic correlation was significantly negative for oil- and protein content (-0.36\*) indicating that simultaneous improvement in seed oil- and protein may be difficult with regard to the negative correlation between those traits.