



Breeding potential for increased protein in lentil

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Some of the seed diversity found in lentil. Photo courtesy of Derek Michael Wright.

Protein-rich pulse crops, such as lentils (*Lens culinaris*), are receiving growing interest due to the increased desire for plant-based proteins. The protein content of lentil varies due to both genetics and the environment in which they are grown. Understanding how to improve lentil protein levels and quality is important for breeding.

Near-infrared reflectance spectroscopy (NIRS), a fast method for estimating protein and amino acid concentrations in a large number of plants, was used on a lentil diversity panel grown in multiple environments in Saskatchewan, Canada.

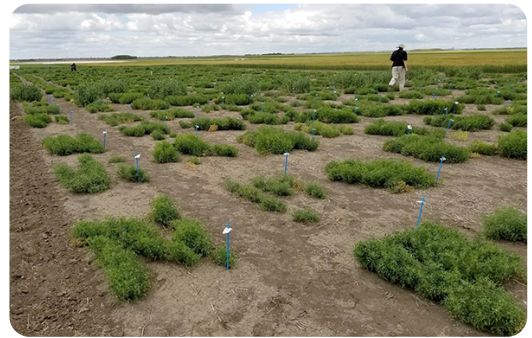
Interestingly, while both the growing environment and plant genetics had significant influences on protein

concentration, days from sowing to flower

and seed size showed little correlation with protein concentration, suggesting the potential for selection independent of both adaptation and market-class traits.

Researchers combined this analysis with genome-wide association studies, identifying several molecular markers with the potential to be deployed in marker-assisted selection to increase protein quality in the Northern Great Plains—a strategy that could be replicated in other regions.

This research demonstrates the potential for breeders to identify adapted germplasm and select for specific amino acids, increasing protein concentration and quality.



Panel of diverse lentil germplasm growing in Saskatchewan, Canada. Photo courtesy of Derek Michael Wright.

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Wright, D. M., Hang, J., House, J. D., & Bett, K. E. (2025). Breeding potential of cultivated lentil for increased protein and amino acid concentrations in the Northern Great Plains. *Crop Science*, 65, e70085.

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