

Sulphur supplementation: a promising fertilization strategy in camelina

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Abstract

Inaccurate fertilization strategies, mainly nitrogen (N), can lead to nutrient imbalances, groundwater contamination, and greenhouse emissions, contributing to the environmental impact of agriculture. In soil fertility management, sulphur (S) often receives less attention compared to other macronutrients, despite S deficiencies in crops have become more common in recent years. Moreover, suboptimal S availability is known to reduce plant N use efficiency and thereby increase N loss potential.

Therefore, improving fertilization efficiency is of primary importance for environmental and economical sustainability of cropping systems, and the inclusion of S in fertilization strategies can be a key factor in enhancing crop performances.

In this preliminary study, the use of low-cost industrial gypsum, as S supplement, has been evaluated in *Camelina sativa* (L.) Crantz, a minor oilseed crop with promising perspectives in food, feed sectors, and in bio-based industry, providing feedstock with low Indirect Land Use Change risk. Despite the wide interest on this crop due to several agronomic advantages and seed compositional peculiarities, camelina still presents some bottlenecks such as not well-defined agronomic management, low seed yield, and productive stability, especially in marginal lands.

So, in order to evaluate the effect of S addition on camelina yield and quality, a field study was set up comparing an ordinary fertilization strategy for camelina with one based on the addition of sulphur. Samplings were performed both at flowering and seeds maturity, assessing biomass production, yield components, N uptake and seeds quality traits.

The achieved results suggest that sulphur had a positive impact on camelina vigour, especially at flowering, when biomass and LAI were significantly increased. At the same time, plants receiving S showed the highest seed yield and seeds quality traits, in terms of oil, protein and glucosinolates. The study, although preliminary, demonstrated the possibility to improve yield and quality of camelina under Mediterranean conditions.

Keywords

Gypsum, Circular Economy, *Camelina sativa* (L.) Crantz, Fertilization Efficiency