Influence of foliar-applied micronutrients on the essential oil and fatty acid composition of caraway (*Carum carvi* L.)

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Caraway (*Carum carvi* L.), is one of the most important spice crops worldwide. In Finland, it has become a 'hit' agricultural product cultivated in over 1.500 farms and 20.000 hectares. Finnish caraway production fluctuated between 4.9-8.2 million kg during the period 2012-2016, while it reached a record 10.4 million kg in 2011. Most of the production is for export, where Finland holds a 1.4% share of the word's spice crop market.

Caraway seeds contain between 1 to 7% oil, depending on whether the crop is annual or biennial, the latter usually accumulating more oil. The essential oil is mainly made of carvone and limonene, and polyphenols, which have antioxidant activity and health promoting properties (Vallverdú-Queralt et al. 2015).

Caraway, cv. 'Record', plant stand was established in 2016 at the Viikki Experimental Farm, Helsinki, Finland. In the second year, 2017, a field experiment was designed on the caraway plant stand using a randomized complete block design with 4 replicates and 5 treatments: a control and a foliar-applied micronutrient of either Copper, Magnesium, Manganese or Zinc. After milling, seed oil was extracted using accelerated solvent extraction method. Essential oils and fatty acids were measured using SPME and GC-FID as described in da Silva and Câmera (2013) and Zi-Tao et al. (2011) respectively.

To our knowledge, no previous studies have assessed the role of micronutrients on caraway oil composition. Our results indicate that while the micronutrient treatments have a significant effect on essential oil composition (Zinc treatment giving the highest limonene content), not such effect was found on fatty acid composition.

References

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