

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

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Abstract

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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Biography

Dr **Clara Lizarazo** completed her PhD in Crop Science at the University of Helsinki, she is a postdoctoral researcher at the Department of Agricultural Sciences, University of Helsinki, and at the Department of Biology and Environmental Sciences, University of Jyväaskylä. She has conducted research on adaptation of grain legume crops to high latitudes, and adaptation strategies of agricultural systems to climate change. She was involved in the EU funded projects "Legume futures" (FP7) and "Climate CAFE" (FACCE ERA-Net Plus). Currently her research focus is on caraway improvement and ecological compensation in Finland.

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