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through appropriate plant protection



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ABSTRACTS



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Oral Presentations
Non-Chemical Control Options II

O NOC II-6

Olfactometer screening of repellent essential oils against the pollen beetle (*Meligethes spp.*)

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In organic farming, pollen beetles (*Meligethes spp.*) are difficult to control due to the ban of insecticides. Alternative methods are therefore needed. The beetles use olfactory cues to locate oilseed rape fields in early spring. Essential oils were shown to have an impact on host plant location behaviour. Lavender oil (*Lavendula angustifolia*) showed the highest repellency value in a laboratory study that compared five different essential oils (Mauchline et al., 2005). However, lavender oil is one of the most expensive essential oils - a fact that could seriously hamper on-farm implementation of this strategy.

The objective of our experiments was to find a cheaper essential oil with comparable efficacy to lavender oil. We compared the essential oils of *Mentha arvensis*, *Eucalyptus globulus*, *Melaleuca alternifolia*, *Citrus sinensis*, *Citrus paradisi*, *Citrus limon*, *Juniperus mexicana*, *Abies sibirica*, *Illicium verum*, *Gaultheria procumbens*, *Cymbopogon flexuosus*, *Syzygium aromaticum*, and *Litsea cubeba* using a Y-tube-olfactometer. Essential oils were diluted 1:10 in acetone and 40 µl of the dilution were applied on a filter paper. Filter papers were placed in the odour containers of the olfactometer together with a flower cluster of spring oilseed rape. Hungry pollen beetles were released individually into the olfactometer. The beetles' choices were recorded. Flowers and essential oils were changed between replicates. Six replicates with six beetles each were conducted.

Ten out of the 15 tested essential oils significantly repelled the pollen beetles; none of the tested essential oils was attractive for the pollen beetles. Highest repellency values were obtained for *Mentha arvensis* (100% repellency), *Cymbopogon flexuosus* (92% repellency), and *Litsea cubeba* (92% repellency). Lavender oil was less effective and repelled only 81% of the beetles.

With an average price of 17.5 and 18 € / kg, *Cymbopogon flexuosus* and *Litsea cubeba* oil are considerably less expensive than lavender oil (104 €/kg). *Mentha arvensis* oil has an average price of 31.50 € / kg. Based on the results of the experiments and on the prices of the essential oils, the development of a field application strategy will focus on *Cymbopogon flexuosus*, *Litsea cubeba* and *Mentha arvensis* oil.

Mauchline, et al. 2005: Entomol Exp Appl 114: 181-188.