

PP51. Organic vs conventional production of peppermint, lemon balm, and lavender; effect on yields and oil composition

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Organic production and markets are expanding rapidly. A field study was conducted to compare effects of organic (OS) and conventional (CS) production systems and unfertilized control on peppermint (*Mentha x piperita* L.), lemon balm (*Melissa officinalis* L.), and lavender (*Lavandula angustifolia* Mill.) productivity and oil profile. *In peppermint*, both production systems provided greater yields than the yields in the unfertilized control. The application of vermicompost at 20 t/ha increased peppermint fresh biomass and essential oil yields with 20-31% and 24-28%, respectively, compared with the control. However, peppermint herbage and essential oil yields under OS were 7-87% and 13-54%, respectively, lower compared with the respective yields under CS. Overall, peppermint under OS had slightly higher essential oil content compared to the control; however, the oil composition was not significantly different from that in the CS. *In lemon balm*, fresh herbage yields in the OS were increased by 12-70% relative to the unfertilized control. However, compared with the yields at CS plots, yields in the OS were satisfactory only during the first year. In the second year, fresh herbage yields in the OS were up to 70% lower compared with those from the CS. The production system did not have a significant effect on the lemon balm oil content and composition. *In lavender*, the OS included two applications of probiotic product on six lavender genotypes. During the first year, CS lavender had 6 to 13% greater essential oil yield compared with the organically grown ones. In the second year, CS grown lavender out yielded OS grown by 9 to 24% in the case of inflorescence and 13 to 24% in the case of essential oil. However, during the third year of the study, the yields of inflorescences from OS stabilized and almost equaled those from CS. Overall, organic production of peppermint, lemon balm, and lavender may result in lower yields in the first 2-3 years, however, the essential oil content and composition may not be affected. Depending on the price premiums for organically produced herbage and essential oil, organically produced peppermint, lemon balm, and lavender may be economically and agronomically viable after the initial couple of years.

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