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Log: 471. **AGRICULTURAL MANAGEMENT, SEASON AND TRACE ELEMENTS EFFECTS ON VOLATILE OIL PRODUCTION FROM MELISSA OFFICINALIS L. (LEMON BALM).** Sussa, F.V.; Duarte, C.L.; Silva, P.S.C. Instituto de Pesquisas Energéticas e Nucleares.

In recent decades, the study of medicinal plants has become the focus of ever more extensive research all over the world, due to diversity and potential that medicinal plants have as source of medicinal products. The *Melissa officinalis* medicinal properties are related to the wide variety of its chemical composition volatile oil, such as terpenoids. These are a large group of secondary metabolites, which can vary qualitatively and quantitatively, depending on various factors such as fertilization, season and nutrient availability in the soil. Providing information on agricultural management, season and trace elements effects on volatile oil is fundamental to obtain the highest production by the specie. *Melissa officinalis* is a medicinal and aromatic species popularly used to promote sleep, reduce stress and anxiety. Their medicinal properties are related to the major compounds of their volatile oil, just like the citronellal, neral and geranial. Container experiments were carried out in the Municipal Gardening School experimental area, in Ibirapuera Park, São Paulo, Brazil. The experimental design was completely randomized with three treatments: control (site soil), organic fertilization (2t/ha of poultry manure) and conventional fertilization (30t/ha of NPK, 6:14:8) in four distinct seasons (spring, summer, autumn and winter). Elemental concentration for the elements As, Ba, Br, Ce, Cl, Co, Cr, Cs, Eu, Fe, Hf, K, La, Lu, Mg, Mn, Na, Nd, Rb, Sb, Sc, Se, Sm, Ta, Tb, Ti, Th, U, V, Yb, Zn and Zr was determined by Instrumental Neutron Activation Analysis (INAA) in *Melissa officinalis* leaves. The analysis of elements Cd, Pb, Ni and Cu was performed using atomic absorption spectrometry (AAS). Certified reference materials IAEA-336 and NIST SRM-1573a Tomato Leaves were analyzed for quality control. The volatile oil was extracted from its leaves by hydrodistillation process in Clevenger apparatus and analyzed by gas chromatography coupled to a mass spectrometer (GC-MS). The major compounds neral, geranial and citronellal were identified by using reference standards from Sigma Aldrich. Data analysis was done by chemometrics such as Analysis of Variance (ANOVA), Correlation Analysis (CA), Hierarchical Cluster Analysis (HCA) and Principal Component Analysis (PCA).