

عنوان مقاله:

Response of Soil Characteristics and Biochemical Composition of Chokeberry (*Aronia melanocarpa*) Fruits to Two Cultivation Systems

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خلاصه مقاله:

Cultivation systems, especially mulching, play an important role in modifying soil properties and have a significant effect on the chemical composition of fruits. Therefore, the purpose of this study was to compare two cultivation systems (black plastic mulch and bare soil) and determine the associated response of soil characteristics and biochemical composition of chokeberry (cv. 'Nero') fruits. Soil properties and fruit phytochemical profile were analyzed using established procedures. Antioxidant activity was determined by several methods and cytotoxic activity was evaluated by MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyltetrazolium bromide) assay. Results indicated that both cultivation systems caused changes in soil physical, chemical, and biological properties. Black plastic mulch led to a greater decrease in clay fractions and most of the agrochemical properties analyzed, and an increase in the numbers of fungi, compared to bare soil. Moreover, mulch was effective in increasing soil temperature and conserving soil moisture by preventing evaporation. This relationship of soil parameters, especially temperature and moisture, under plastic mulch increased the content of certain bioactive phenolic compounds (condensed tannins, gallotannins, and flavonols) and contributed to the strong antioxidant and cytotoxic activity of chokeberry fruits. In contrast, bare soil favored synthesis of other phenolic compounds (total phenols, flavonoids, anthocyanins, flavan-3-ols and phenolic acids). Principal Component Analysis (PCA) revealed the effect of cultivation systems on the biochemical composition of fruits. Results showed that cultivation systems had a significant influence on soil characteristics in the chokeberry orchard as well as on the biochemical composition of chokeberry fruits, which indicates different pathways of metabolite synthesis under various cultivation practices

کلمات کلیدی:

Bare soil, Bioactive compounds, Black plastic mulch, Soil properties

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