

## Green Pod Yield, Total Phenolic Content, and Antioxidant Activity of Soilless and Open Field Soil Grown Common Bean

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There is increasing pressure to reduce water use and environmental impact associated with open field conventional agriculture in arid and semiarid regions (e.g., Middle East) due to severe shortage of water resources and soil problems. The trend in recent years has been towards conversion of conventional agriculture to soilless agriculture (mainly closed system) which is considered to be a more efficient in utilizing all the resources efficiently (e.g., efficient water use and fertilizer management) for maximizing yield of crops. Secondary phenolic metabolites play an important role in plant defense mechanisms, and increasing evidence indicates that many are important in human health. To date, few studies have investigated the impact of various cultivation methods (soilless system vs. open field) on levels of secondary plant metabolites. The aim of this study was to compare green pod yield, total phenolic and flavonoids content, and antioxidant activity in green pods of common bean (*Phaseolus vulgaris* L.) grown under soilless culture with those grown under open field soil conditions. After determination of green pod yields, a part of bean pods were cleaned, air-dried and analyzed for total phenolic and flavonoids content, and antioxidant activity using standard methods of analysis. Results showed an increase of about 442% in the green pod yield, when grown in soilless system compared to that grown in the soil. The results showed also that the plants grown in the soilless system had a comparable phenolic, flavonoids contents, and antioxidant properties as compared to those grown in the soil. This study validated the potential of soilless culture as a developed method to enhance the vegetables yield and the nutritional properties of plants.

**Keywords:** Flavonoids, *Phaseolus vulgaris*, phenols, phytochemicals,

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