Little difference between organic and non-organic tomatoes

**Little difference** was found between organically grown tomatoes and tomatoes grown conventionally in greenhouses over a three year period, in terms of taste and nutritional value, according to a recent study in the Netherlands. Taste and nutrition were more dependent on the breed of tomato.

**Organic farming methods** are considered by many to be more environmentally friendly than conventional methods. However, there is on-going debate about whether organic food is healthier than conventionally produced food. This study compared organic and conventional farming systems for their effects on tomato growth and quality.

Three modern varieties of tomatoes and an old variety were grown in greenhouses in the Netherlands over a three year period under a variety of conventional and organic systems. There were two organic systems – tomatoes were grown in soil for both, but one was with added straw (for extra nutrients) and the other was without. Organic fertilisers were used, such as green-waste compost and cow manure, and cover crops (vetch, rye) were grown and dug in to supply additional nutrients.

For the conventional systems, the researchers assessed three types of cropping. Tomatoes were grown in rockwool (a growth medium which provides extra nutrients) for two systems, nourished with either a normal or an increased concentration of nutrients, and for the third, they were cultivated in soil fertilised with inorganic fertilisers.

Soil samples were analysed before and during the growing season. The tomatoes were picked, counted and weighed every week and analysed for concentrations of vitamin C, carotenoids and flavonoids (for health benefits) in addition to glucose, fructose and sucrose sugars and other contents, such as nitrates and oxalates for taste. Based on these values, a fruit quality index was calculated to assess the nutritional value and general health benefits of the different cropping systems.

There was little difference in the growth rates between the various cropping systems. Analysis of plant tissues suggested that nitrogen and other essential nutrients were not limiting in this experiment. In addition to nitrogen in the form of nitrates, organically grown tomatoes were able to selectively use other forms of nitrogen, such as organic nitrogen or ammonium.

Overall, tomato yields from the conventional soil-grown and organic systems were similar, although organic yields were 15 per cent lower than those from conventional rockwool systems. The older variety produced the lowest total weight of tomatoes from both systems.

The fruit quality, in terms of taste and nutritional value, did not differ significantly between tomatoes grown in organic or conventional systems. It can take a number of years for soil nutrients to reach optimal levels using organic fertilisers and nutrient availability in the organic systems had probably not been fully established in the three years of the experiments.

However, the type of tomato was more important in determining fruit quality than the type of cropping system: the older variety produced tomatoes with the highest quality index compared with the modern cultivars, implying there is trade-off between tomato quality and yield.

If the aim of organic systems is to produce fruit of superior quality, it is suggested that old cultivars could be used to develop new tomato cultivars adapted for organic cultivation rather than for conventional systems.


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**Theme(s):** Agriculture