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“Filling gaps and removing traps  
for sustainable resource management”

## A Novel Method of Vermicompost Placement in Organic Tomato Production

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### Abstract

The need to produce more crops for feeding a growing population world-wide raises questions of more efficient uses of agricultural inputs. In agricultural fields, composts are commonly applied to the field soil by broadcast. This method does not ensure that nutrients as part of applied compost are available to the plant roots at the right time and at the right quantity. In this field study, we compare the effect of compost placement (in two different methods) to compost broadcast on yield attributes and nutrient uptake for organic tomato field. Three methods of placement of the vermicompost (VC) were used in a two-year field trial in north east Iran: 1. VC placed in a row on the soil surface with incorporation, behind the plantation lines (R), 2. Broadcast on the field (B), and 3. in the transplant hole, under the root (U) which is our novel method for this study. As a second factor, VC was applied at three different rates of application, namely 3, 6 and 9 t ha<sup>-1</sup> for R and B, and 2, 4 and 6 t ha<sup>-1</sup> for U. In both years, the different rates and placement methods had no significant effect on the fresh yield of tomatoes. However, in treatments with a higher rate and using the U placement increased the dry matter yield of the plants by up to 50% (8.4 t ha<sup>-1</sup>) in the second year. This suggests that our novel method (U) could reduce the amount of compost application without a significant change in yield production. Treatments with U placement method showed 23% higher nitrogen uptake (156 kg ha<sup>-1</sup>) compared to B method (121 kg ha<sup>-1</sup>). The U method of placement seems to be a suitable alternative to the B method for field-grown vegetables such as the tomato. Considering the high price and quality of vermicompost compared to the other types of compost, this novel method can be economically considered by farmers.

**Keywords:** Fertiliser placement, nutrient uptake, organic tomato, soil conditioners, vermicompost