



Potassium nitrate outperformed alternative K-sources of processing tomato in terms of yield and quality

A series of experiments was conducted in Hungary, Spain, Italy and Israel to evaluate the specific contribution of potassium nitrate to yields and quality parameters of processing tomatoes (

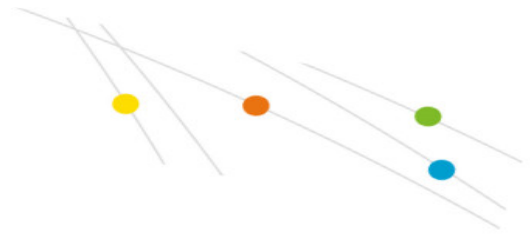
Lycopersicon esculentum

Mill.).

In Hungary, 92 kg ha⁻¹ of side-dressed K₂O applied as potassium nitrate (NOP) was proven superior to potassium chloride (MOP) and to potassium sulfate (SOP) as based on total marketable yield (12,8% over control) (Figure 1), mean fruit weight (3,9% over control) and dry matter content (26,1% over control).

In Spain, side dressing with 92 kg ha⁻¹ of K₂O, applied as potassium nitrate, improved plant performance by increasing mean plant yield, °Brix and mean fruit weight by 25%, 5,13%, and 5,15%, respectively. Total yield was increased from 59 to 70 t ha⁻¹ (Figure 2). Consequently, the added income to the grower far exceeded his marginal costs for fertilizers.

In Italy, application of 260 kg ha⁻¹ of K₂O was most effective (total yield =187 t ha⁻¹) when 70% of this dosage was applied as potassium nitrate via fertigation during the growing season. This treatment generated higher yields compared to application of the entire N-P-K or the entire P-K rates as a single pre-transplant application (156 t ha⁻¹, or 177 t ha⁻¹, respectively) (Figure 2). Additional benefits of the fertigation treatment were a higher proportion of class I fruit and an increased mean fruit weight; however, °Brix was somewhat reduced.



In Israel, the authors found a convex parabolic response of lycopene yield and concentration in tomatoes of 4 different cultivars to the K concentration in the nutrient solution. Lycopene concentration of 207 mg kg⁻¹ in fruit fresh matter was obtained when K concentration in the nutrient solution was 8 meq L⁻¹. Highest lycopene concentrations were observed when fruit dry matter was 4,5% or higher. Nitrate was found to be the best form of nitrogen for maximum lycopene concentration in the fresh fruit (Figure 2).

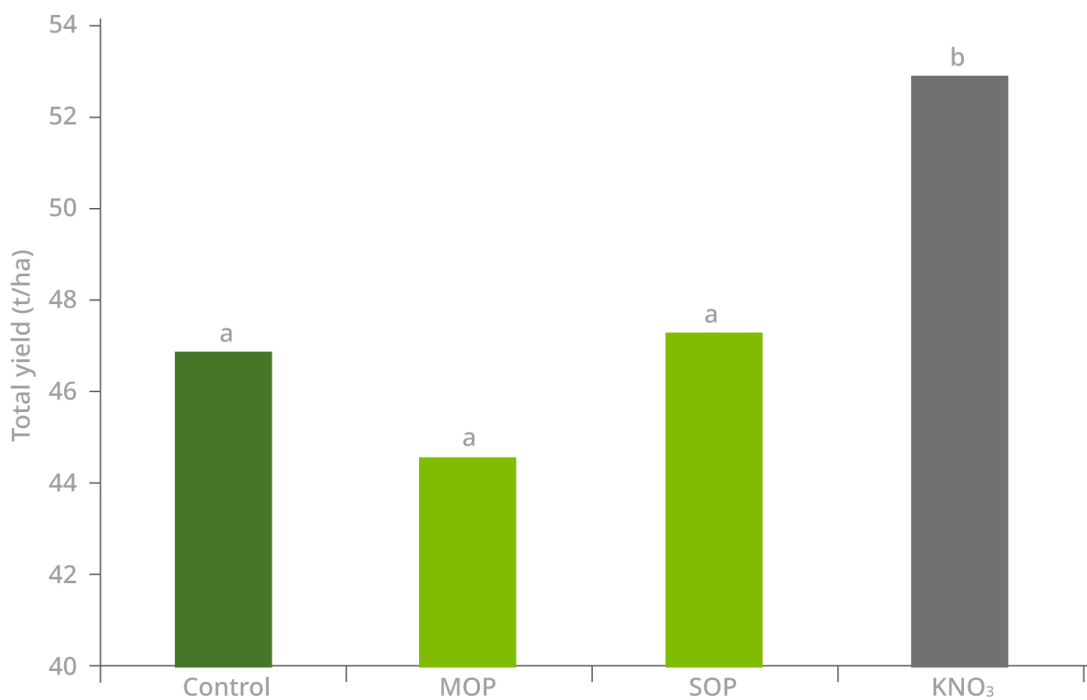


Figure 1. The effect of different K-sources on the total tomato yield in Hungary.

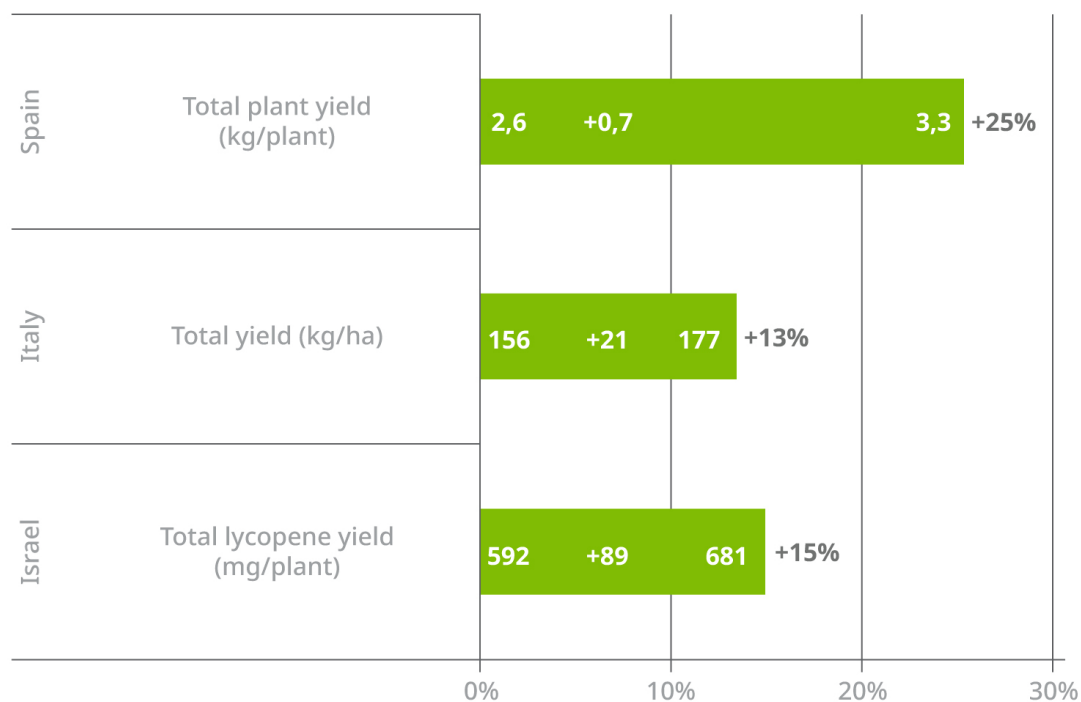
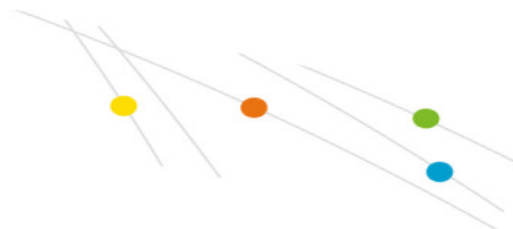


Figure 2. The yield increase (%) by using potassium nitrate in processing tomato. In Italy only base dressing is compared with 70% KNO_3 as fertigation. For Israel the benefits of only nitrate is compared to nitrate/ammonium combination.