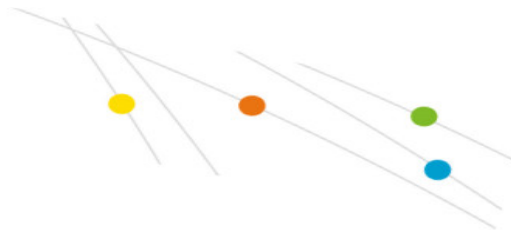


Supplementary potassium nitrate improves salt tolerance in bell pepper plants

In Turkey, the effect of supplementary KNO_3 on growth and yield of bell pepper plants, grown under high salinity in pots, filled with loamy clay soil, was studied. The untreated control and NaCl salt treatments were combined with different potassium nitrate additions to the soil. Supplemental KNO_3 was applied in three equal parts: banded into the soil prior to planting, and top-dressed at flowering and fruit set.

Plants grown at high NaCl concentrations had significantly less dry matter, plant height, chlorophyll and fruit yield than those in the untreated control treatment (Table 1). Membrane permeability increased significantly with high NaCl application, but less so when supplementary KNO_3 was applied (Table 2). High NaCl resulted in plants with very leaky root systems as measured by high K efflux; rate of leakage was reduced by supplementary KNO_3 . These data suggest that NaCl status affect root membrane integrity. Concentrations of K and N in leaves were significantly lower in the high salt treatment than in the control. For the high salt treatment, supplementing the soil with KNO_3 at 1 g per kg resulted in K and N levels similar to those of the control. These results support the view that supplementary KNO_3 can overcome the effects of high salinity on fruit yield and whole plant biomass in pepper plants.

Table 1. Effects of NaCl salinity and potassium nitrate treatments on bell pepper plants.



NaCl treatment (g/kg soil)	KNO ₃ treatments (g/kg soil)	Whole plant DW (g/plant)	Plant height (cm)	Total chlorophyll (mg/kg DW)	Fruit yield (g/plant)
0	0	37,4 b	68,1 a	1775 c	1680 a
0	0,5	38,8 ab	69,7 a	1845 b	1720 a
0	1,0	40,8 a	71,3 a	1930 a	1760 a
3,5	0	22,7 c	51,3 d	1251 d	810 d
3,5	0,5	27,3 b	57,6 c	1538 d	1020 c
3,5	1,0	34,4 b	65,7 b	1595 d	1320 b

Table 2. Effects of NaCl salinity and potassium nitrate treatments on membrane permeability bell pepper roots.

NaCl treatments (g/kg soil)	KNO ₃ treatments (g/kg soil)	Cum K release from roots after 48 hours (μmol/g/root dm)
0	0	44 c
0	0,5	47 c
0	1,0	51 c
3,5	0	208 a
3,5	0,5	127 b
3,5	1,0	69 c