Foliar potassium nitrate sprays decreased blossom end rot incidence and increased yield in tomato

A study was carried out to investigate the effect of 2 levels of gibberellic acid (10^{-4} and 10^{-8}) and 2 levels of potassium nitrate (6 and 8 mM) as foliar sprays on the growth, leaf-NPK content, yield, fruit quality parameters and the blossom end rot incidence of tomato. Tomato plants of cultivar Tivi F1 were grown outside during the 2013-2014 growing season in Ilam, Iran. The soil of the experimental field was silty loam in texture with a pH of 7 and containing 107 mg/kg K. Foliar sprays were applied two times with a back-held sprayer at 30 days after transplanting and when the fruits were berry-sized.

Foliar potassium nitrate application alone statistically significantly decreased blossom end rot while increasing leaf-NPK content, chlorophyll content and nitrate reductase activity. The 8 mM potassium nitrate application increased the chlorophyll content of the leaves to its maximum (48 SPAD). This was a significant increase relative to the control and other treatments. The nitrate reductase activity increased from 3 in the control to 6,9 with 8 mM KNO_3. The number of branches per plant and the mean plant height increased significantly with foliar application of GA_3 and KNO_3 either alone or in combination. The combination of both foliar sprays also significantly increased the number of flowers per cluster from 19 in the control to 36 with 10^{-8} GA_3 and 8 mM KNO_3. The yield, fruit weight and fruits per plant of tomato increased significantly with foliar application of KNO_3 and GA_3 either alone or in combination (Table 1). The potassium nitrate foliar sprays significantly decreased blossom end rot (Table 1). With regard to fruit quality, the application of GA_3 at 10^{-8} mM, 8 mM potassium nitrate and

combination of both sprays increased fruit lycopene content, total soluble solids, vitamin C and titratable acidity compared with the control treatment.

From this study, it can be concluded that spraying with gibberellic acid and potassium alone or in combination increased vegetative growth and yield and quality of tomato.

Table 1. Effect of KNO_3 and GA_3 foliar sprays on yield and quality of tomato

Treatment	Yield (MT/ha)	Fruits per plant	Fruit weight (g)	Blossom end rot incidence (%)
Control	12 c	76 c	60 c	20 a
10^{-4} mM AG_3	17 bc	80 b	78 bc	18 ab
10^{-8} mM AG_3	22 a	97 a	111 a	18 ab
6 mM KNO_3	17 bc	83 b	85 bc	9 cd
8 mM KNO_3	22 a	97 a	112 a	3 d
10^{-4} mM AG_3 + 6 mM KNO_3	18 b	90 ab	88 b	15 bc
10^{-4} mM AG_3 + 8 mM KNO_3	18 b	91 ab	94 ab	11 c
10^{-8} mM AG_3 + 6 mM KNO_3	23 a	95 ab	101 ab	15 bc
10^{-8} mM AG_3 + 8 mM KNO_3	24 a	100 a	130 a	10 c