

ABSTRACT

Physiological studies on sweet pepper in new reclaimed lands

Two field experiments were conducted on pepper plants during the summer seasons of 1996, 1997 and 1999 at the Experimental Farm of Nubaria Horticulture Research Station, Agriculture Research Center, Ministry of Agriculture, Egypt.

The objective of the 1st experiment was to study the effect of potassium applied as soil dressing with different levels and application times on growth development, productivity and fruit characters of pepper plants in new reclaimed lands.

The first experiment included 20 treatments, which were five rates of potassium fertilizer; i.e., 0, 100, 125, 150 and 175kg K₂O/fed. as potassium sulphate (50% K₂O) with four potassium application times. Potassium application times were conducted as follows. The first time (T₁): A 50% of K level was added at the time of soil preparation, meanwhile, the remaining 50% was divided into two equal doses, where 25% of it was applied one month after the transplanting and the remaining 25% was added after one month later, i.e., 30 and 60 days after the transplanting, respectively. The second time (T₂): A 25% of K level was added during soil preparation, whereas, 50% of its quantity was added one month after the transplanting and the remaining 25% was applied two months later, namely, 30 and 90 days after the transplanting, respectively. The third time (T₃): A 25% of K level was added during soil preparation and 50% of its amount was added two months after the transplanting, meanwhile, the remaining 25% of it was applied after the last dose with one month, i.e. 60 and 90 days after the transplanting, respectively. The fourth time (T₄): A 75% of potassium level was added two months after the transplanting, whereas, the remaining 25% of its quantity was added one month later, i.e., 60 and 90 days after the transplanting, respectively

Increasing K fertilization level was followed by an increase in stem length, leaf area, number of branches, fresh and dry weights of stems and leaves as well as entire plant weight. Also, higher levels enhanced N,P and K contents in leaves but decreased Ca and Na concentrations in leaves. Early and total yields were gradually increased by any increased in potassium level. High K level also had a favorable effect on quality of fruits. Results obtained revealed that, T₃ gave often the most vigours vegetative growth of plants and N, P and K contents in leaves were also enhanced by T₃. The highest values of both early and total yields /fed. as well as fruit quality were obtained when using T₃.

Second experiment was carried out during the summer seasons of 1997 and 1999 at the Nubaria Experimental Research Farm Station. In this experiment the most promising K levels and times of K soil fertilization obtained from results of 1st experiment were used along with three different levels of K applied as foliar spray. The spray was an aqueous solution of K in EDTA form at concentrations of 0.5, 1.0 and 1.5% K₂O. Foliar applications were applied for three times at 15 days intervals beginning at flowering stage.

With increasing potassium level the growth was significantly enhanced using the highest level of K (175kg K₂O/fed.) which was responsible in obtaining the highest fresh and dry weights of plant. The higher level of K resulted in an increase in early and total yields of pepper fruits/ fed. The growth not affected by time of application. The highest values of early and total yields were obtained as a result of adding K at T₃. The results revealed that, fresh and dry weights were significantly increased with K foliar spray by the concentration of 0.5%. The highest early and total yields were recorded with K foliar spray by the concentration of 0.5%.

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