

## Quality of apple cv. RED DELICIOUS as influenced by potassium

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### ABSTRACT

Twelve treatment combinations of soil and foliar potassium applications were tested to study the effect of potassium on quality and nutrient concentration of apple fruit under orchard conditions. The study revealed that all the treatments exhibited positive effect on apple quality. All the treatments significantly increased the fruit weight, length, diameter, TSS, color and fruit firmness, while simultaneously a decrease in fruit acidity was also recorded. Highest fruit weight, length, diameter, TSS and color were recorded in treatment combination  $S_3F_2$  (i.e. soil  $K_2O$  @ 2250gm/tree + foliar spray of 1.5%  $K_2SO_4$ ) which was found at par with  $S_2F_2$  treatment. (i.e. soil  $K_2O$  @ 1500gm/tree + foliar spray of 1.5%  $K_2SO_4$ ); significant increase and decrease in the fruit potassium and calcium contents, respectively, was also observed.

**Key words :** Potassium, Nutrient concentration, Apple, Fruit quality

Jammu and Kashmir has a significant position in the horticultural map of the country and apple being a predominant fruit crop of the state is grown over a large acreage of more than 1.0 lac hectares and forms the backbone of state economy. Although the agro climatic conditions of the state are congenial for apple production yet the productivity of quality fruit is substantially low, for many reasons for low production of quality fruit, the inadequacy of K is one of the striking factors that regulate the fruit quality. It is often described as the quality element for fruit crop production and is required by fruit plants for higher yield and better quality as it activates more than 60 enzymes and is directly or indirectly involved in major plant growth processes including  $CO_2$  assimilation, ATP synthesis, transpiration, photosynthesis etc. (Haider and Mengel, 1976). In addition K nutrition also effects the mineral uptake and their distribution to different plant parts like shoots, leaves, fruits etc. Market qualities, fruit size, soluble solids and yield of apples increase upon foliar application of potassium (Doroshenko *et al.*, 2005). On soils with high K-fixing ability and simultaneously low K-availability, at least 3 sprays with K during six weeks before harvest have been recommended in apple orchards to improve fruit quality (Wojcik, 2005). Taking all these views in consideration the present investigation was carried out to see the effect of K nutrition on fruit quality of apple (RED DELICIOUS).

### MATERIALS AND METHODS

To investigate the effect of K on apple an experiment was carried out on an orchard situated in the campus of SEKUAST-K, Shalimar (J&K), Srinagar (India). The orchard selected was of uniform age with principal apple

cultivar of Red delicious. The orchard soil was analyzed for various physicochemical properties and was observed to be of medium nutrient status, slightly acidic in pH with illitic mineralogy and silty clay loam in texture. The experiment was conducted in randomized block design with three replications and 12 treatments viz.  $S_0F_0$  – control (no soil or foliar application),  $S_1F_0$  – soil application of 750 g $K_2O$ /tree and no foliar spray,  $S_2F_0$  – soil application of 1500 g $K_2O$ /tree and no foliar spray,  $S_3F_0$  – soil application of 2250 g $K_2O$ /tree and no foliar spray,  $S_0F_1$  – no soil application but foliar spray of 0.75%  $K_2SO_4$ ,  $S_1F_1$  – soil application of 750 g $K_2O$ /tree and foliar spray of 0.75%  $K_2SO_4$ ,  $S_2F_1$  – soil application of 1500 g $K_2O$ /tree and foliar spray of 0.75%  $K_2SO_4$ ,  $S_3F_1$  – soil application of 2250 g $K_2O$ /tree + foliar spray of 0.75%  $K_2SO_4$ ,  $S_0F_2$  – no soil application but foliar spray of 1.5%  $K_2SO_4$ ,  $S_1F_2$  – soil application of 750 g $K_2O$ /tree and foliar spray of 1.5%  $K_2SO_4$ ,  $S_2F_2$  – soil application of 1500 g $K_2O$ /tree and foliar spray of 1.5%  $K_2SO_4$  and,  $S_3F_2$  – soil application of 2250 g $K_2O$ /tree + foliar spray of 1.5%  $K_2SO_4$ . The plants under treatment were fertilized with the fixed doses of N and P as per recommended dosage in the form of urea and SSP. Further foliar sprays of K in the form of  $K_2SO_4$  were given at two different stages, 1st one month after full bloom and 2<sup>nd</sup> one month after 1st spray. Fruit samples as per the procedure of Waller (1980) were collected from the same orchard in the month of September and analysed for quality parameters viz. average weight of fruits which was calculated using a balance, fruit length and diameter with vernier calliper, total soluble sugar content was calculated with refractometer. The titrable acidity was estimated in terms of per cent malic acid by titrating the sample against 0.1 N standard NaOH using