

# Combined effect of soil and foliar application of boron and calcium on yield and quality of apple cv. RED DELICIOUS

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## ABSTRACT

A field experiment was carried out to study the effect of foliar as well as soil application of Ca and B on yield and quality of Red Delicious apple trees uniform in size and vigour were taken for experiment during the year 2004-2005. The apple trees received combined treatments of Calcium Chloride and Boron were observed to be better in yields and fruit quality of apple. Application of Boron @ 0.1% as foliar spray and soil application of calcium chloride 100g/tree was observed to be best treatments.

**Key words :** Apple Red Delicious, Soils foilar nutrition, Yields quality.

**I**n India the best quality apples are grown in the Kashmir valley and hence known as “Apple Bowl of India”. Apple cultivation has got revolutionized after the introduction of exotic cultivars of apple by Zain-ul-Abiddin and delicious group of apple during the last century in Kashmir valley which now accounts for 60-70% of total fruit yield. The productivity of J & K (11 tons/ha) is significantly high in comparison to Himachal Pradesh (7 tons/ha) and Uttranchal (3.5 tons/ha), however, it is far below the international level of 30 tonns/ha. Among the various challenges for production is nutrition management, very meagre amount of rainfall (about 700mm) coupled with its erotic distribution results in nutrient deficiency in general and Ca & B deficiency in particular at flowering stage which causes a server pollination problem and ultimately reflects by severe drop in economic yield of apple.

It has been observed that water stress has triggered many physiological disorders and availability of nutrients especially Boron (Davenport and Pernaee, 1990) and Calcium (Ford, 1979) resulting in poor development of fruit and hard corky tissue especially at calyx end of fruit. Boron is freely translocated form treated leaves to adjacent fruits (Brown and Hu, 1996) and for calcium to be effective it should directly penetrate the fruits (Khanizadeb, 1999).

Micro-nutrients are usually require in minute quantities, nevertheless are vital to the growth of plant. Boron is an important micro-nutrients governing many physiological and bio-chemical plant processes. Its

beneficial effects on Horticulture crop have been reported (Dutta *et al.*, 2000). The fruit receive root observed calcium in initial stages of development via xylem. Later on with the fall of transpiration in developing fruit, the supply of Ca enter through phloem along with photosynthesis in which Ca is relatively immobile (Simon, 1978).

The present investigation was undertaken to study the effect of calcium and boron on yield and quality of apple through soil and foliar application.

## MATERIALS AND METHODS

The experiment was conducted at fruit research Sub Station Rohnoo / Balpora SKUAST (K) India during the year 2004-2005 on twenty five year old apple trees uniform size and vigour under rendomized block design. Eleven treatments of calcium and Boron application through foliar and soil replicated as described Table 1. The first spray being carried out during the timing of petals fall for two times fifteen days interval. Soil application of calcium chloride was applied at the time of flowering stage. The plants were spaced at 7.0m in 7.0m in clay loam soil. Uniform cultural practices were followed for all the experimental plants. At the time of harvest, fruit yield was recorded in terms of number of standard wooden boxes removed from each tree. The rating of fruit on colour intensity and external appearance was done by a pannel consisting of five judges on percentage basis. Fruit size and weight was determined by selecting randomly ten fruits from each treatment and by recording their length and width in cms and weight in gms. Total soluble solids (TSS) was recorded by hand Refractometer. Titrable acidity (as malic acid) and total sugars were