

## Effect of Rate and Time of Urea Foliar Application on Yield and Biochemical Characteristics of the Kinnow Mandarin Trees

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Nitrogen plays an important role in managing the nutrition of citrus. In this study effects of three concentrations of urea (0, 0.75%, and 1.5%) and three times of urea foliar application (Dec 22, Jan 5, and Jan 20) on biochemical characteristics of the kinnow mandarin trees were evaluated. The experiment was conducted as factorial based on a randomized complete block design with three replications. Sampling was done from leaves and nodes at 1, 3 and 5 weeks after spraying. The yield and biochemical characteristics such as carbohydrate, starch, protein, total chlorophyll, proline were measured. The results of this study showed that in the five weeks after foliar application, the highest leaf carbohydrate, starch, protein and node starch obtained from plants sprayed with urea on Jan 5 in off year. The three weeks after foliar application, the highest amount of leaf and node proline (respectively 348.5 and 383.3  $\mu\text{mol g}^{-1}$  FW) were related plants sprayed with urea on Jan 22 in on year. The highest amounts of carbohydrate and total chlorophyll of nodes (respectively 85.88 and 1.6  $\text{mg g}^{-1}$  FW) were reported in off year with 1.5% urea concentration on the 30th January. According to the results of this study, urea foliar application in January 15th, can be advised in order to increase yield and control of alternate bearing in the Kinnow Mandarin trees.

**Keywords:** Carbohydrate, Spray, Starch, Urea concentration.

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