

## Is the Plant Response to Available Nitrogen Forms in Soil Vary Among Vegetable Crops?

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Matching preferential needs of crop during fertilization could contribute to increase nutrient use efficiency. A study was conducted to assess crop responses to form/s of N available in root environment of selected vegetable crops. Six crops (Lettuce, Carrot, Capsicum, Tomato, Knolkhol and Cabbage) were grown in a pot experiment with different percentages of  $\text{NH}_4^+$  and  $\text{NO}_3^-$  supplying N ( $\text{NH}_4^+$  and  $\text{NO}_3^-$  as 0:100, 25:75, 50:50, 75:25 and 100:0 percent ratio) in sand-culture. Biomass accumulation and uptake of K, P and N were analyzed at the end of vegetative stage. Dicyanamide (DCD), a nitrification inhibitor, was added to maintain desired  $\text{NH}_4^+:\text{NO}_3^-$  ratio. In another pot experiment, Tomato and Capsicum were grown on soils (Ultisol) collected from two fields (SF1 and SF2) with three N-treatments; T1-control (no urea), T2-Urea and T3-Urea+DCD. Free drainage was not allowed until harvest at 45 days after transplanting. A third pot experiment was conducted repeating same N-treatments with soil SF1 and Capsicum as test crop. In this treatment, free drainage was allowed after irrigation and leachate was analyzed for  $\text{NO}_3^-$ . Biomass accumulation and uptake of N and K were significantly ( $p < 0.05$ ) affected by crop type, N treatment and their interaction. Highest biomass accumulation for Tomato and Capsicum were under 100%  $\text{NO}_3^-$  and 100%  $\text{NH}_4^+$ , respectively. Carrot was not affected by form of N. Lettuce and knolkhol accumulated highest biomass under 75:25 treatment and cabbage performed well under 25:75 treatment. Availability of  $\text{NH}_4^+$  in soils significantly increased under T3 compared to T2 but had no significant effect on biomass accumulation of capsicum and tomato. Leachate from pots contained  $\text{NO}_3^-$  and values were lower under T3 than T2. Vegetable crops have preferential N forms but response to relative abundance of N forms can be different when cultivate in soil.

**Key words:** Ammonium, Biomass accumulation, Nitrate, Nitrogen forms, Vegetable crops

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