

Application of Phosphorus Fertilizer with ‘NutriCharge’ Improves Potato Tuber Yield and Phosphorus Use Efficiency

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Background Information

‘NutriCharge’ is a chemistry that when applied to phosphorus fertilizers prevents fixation with cations in the soil. It does this by sequestering the cations that usually bind to phosphate, thus leaving the phosphate free to be taken up by the plant.

A study was conducted at the San Luis Valley Research Center, in Colorado, to evaluate the effect of ‘NutriCharge’ application with 10-34-0 as source of P fertilizer on tuber yield of Canela Russet, and the effect of ‘NutriCharge’ (NC) application on P Use Efficiency. Rates of P fertilizer used in the study included 1) 60 lb P₂O₅/acre (100% P) and 2) 45 lb P₂O₅/acre (75% P), with or without ‘NutriCharge’ added. Rate of NutriCharge when added was 0.5% of fertilizer volume.

Results

Tuber Yield

Application of 100% phosphate fertilizer with ‘NutriCharge’ increased total yield, marketable (> 4 oz.) tuber, and large marketable (> 6 oz.) tuber yield, by 6%, 15%, and 19%, respectively (Table 1). When P fertilizer was reduced by 25% and ‘NutriCharge’ was added, Yields increased by 10% and 11%, for > 4 oz. and > 6 oz. tuber yield, respectively (Table 1).

Table 1. Effect of phosphorus fertilizer with ‘NutriCharge’ application on tuber yield of Canela Russet

Treatment	Total	<u>> 4 oz.</u> Tuber Yield (cwt/acre)	<u>> 6 oz.</u>
100% P fertilizer	391 <i>b</i> ¹	318 <i>b</i>	209 <i>b</i>
75% P fertilizer + NC	415 <i>a</i>	349 <i>a</i>	232 <i>ab</i>
100% P fertilizer + NC	414 <i>a</i>	365 <i>a</i>	249 <i>a</i>

¹ Numbers in the same column and bearing the same letters are not significantly different at the 0.05 significant level.

Phosphorus Use Efficiency

Phosphorus Use Efficiency (PUE) was calculated as (cwt of potatoes produced/lb of P fertilizer applied). When P fertilizer was reduced by 25% and 'NutriCharge' was added, it increased PUE by 47% (fig. 1). 100% P fertilizer with NutriCharge added increased PUE by 15% (fig 1).

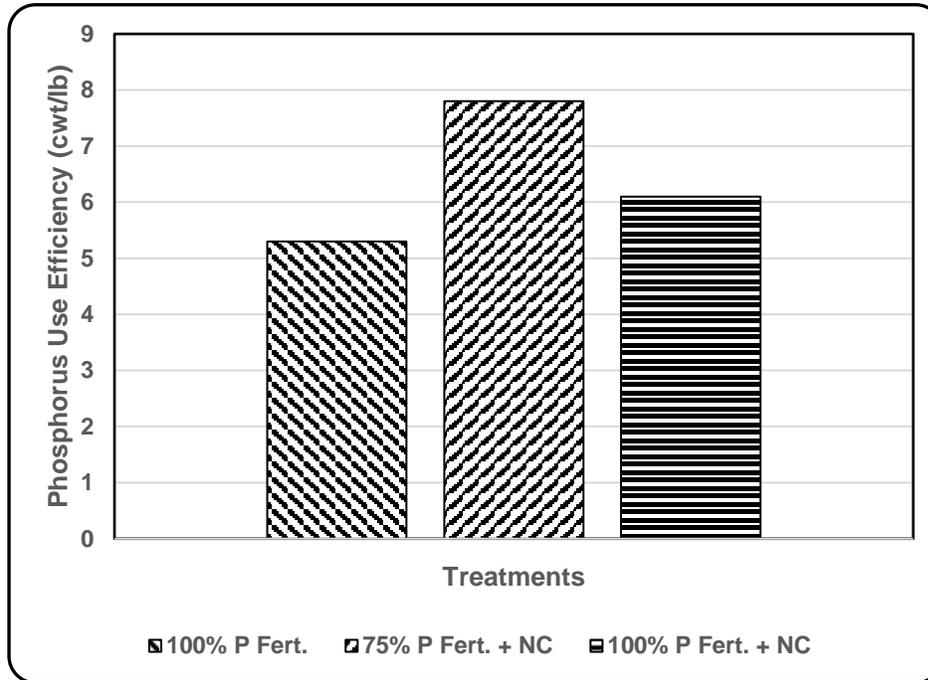


Fig. 1. Effect of NutriCharge (NC) application on Phosphorus Use Efficiency of Canela Russet

Summary

Addition of 0.5% (by fertilizer volume) of 'NutriCharge' to phosphorus fertilizer improves tuber yield and increases phosphorus use efficiency of Canela Russet.