

NITROGEN MANAGEMENT AS AFFECTING PLANT NUTRITION AND YIELDS OF SUPER EARLY CYCLE GENOTYPES OF COMMON

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The Breeding program of Embrapa Rice and Bean has developed new genotypes of common beans with super early cycles. These genotypes have life cycles of 65-75 days, compared with life cycle lengths of 95-105 days for traditional cultivars. However, no study about N management in the SEG of common bean exists. The aim of this study was to measure yield components and grain yield of super early genotypes of common bean as affected by timing of N fertilization. Field experiments were conducted over four consecutive growing seasons (winter 2014, summer 2014/2015, winter 2015 and summer 2015/2016) in the city of Santo Antonio de Goias, GO, Brazil. The experimental design was a randomized complete blocks layout arranged in a split-plot scheme with four replicates. The main plots comprised of the SEG of common bean (IPR Colibri - control, CNFC 15873, CNFC 15874 and CNFC 15875) and subplots were time for N fertilizer application (90 kg of N at sowing, 90 kg N at topdressing; 45 kg of N at sowing plus 45 kg at topdressing), with urea as the source of N. A treatment without N fertilization was also included as control. Topdressing fertilization was done at the V4 phenological stage (third trifoliolate expanded leaf). In relation to N application timing, differences between treatments for all variables were not observed, ie in the conditions studied (soil organic matter range from 26.8 to 45.7 g dm⁻³ in all soil where trials were performed), the genotypes did not respond to N fertilization. Another factor that may have influenced these results was the shortest cycle of the varieties used, while the time of topdressing for traditional cultivars (95-105 day life cycle) occurs at 20-25 days (V4 stage) after emergence, with the super early genotypes with a life cycle of 60-65 days, the V4 stage happens at 12-16 days after emergence. In the summer growing seasons, genotypes CNFC 15873 and 15875 CNFC did not differed from control (IPR Colibri) in grain yield. On the other hand, the genotype CNFC 15874 showed the highest grain yield in the winter growing season. As a conclusion, the N availability in the soil with improved fertility and medium to high levels of organic matter was sufficient to meet the demand of the common bean crop to achieved yield levels of up to 3000 kg ha⁻¹. Thus, fertilization with N, regardless of any time of application, provided no increases in yield components and grain yield of super early genotypes of common bean. Under these conditions, the N application timing did not affect grain yield. The genotypes CNFC 15873 and CNFC 15875 had higher grain yields in the summer rainfed growing season. On the other hand, the genotype CNFC 15874 had higher grain yield in irrigated winter growing seasons. Based on the results, it can be inferred that the use of super early genotypes of common bean showed a promising technology providing grain yield similar to the cultivar control (IPR Colibri) with cycles ranging from 65 to 77 days.

Keywords: Nitrogen fertilization; early application of N; Brazilian Cerrado

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