RESPONSE OF GROUNDNUT TO BRADYRHIZOBIUM AND A DIAZOTROPH BACTERIAL INOCULUM UNDER DIFFERENT LEVELS OF NITROGEN

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ABSTRACT

Microbial inoculant (biofertilizer) can maintain the effectiveness of chemical fertilizer, but can also reduce their expense as farm inputs for sustainable crop production. Field studies were conducted to examine the effect of Bradyrhizobium sp. (Arachis) alone as seed treatment and in combination with a diazotroph bacterial (Azotobacter chroococcum + Azospirillum lipoferum) inoculum as two sprays on groundnut (Arachis hypogaea) crop after germination under N fertilizer levels of 0, 10, 20 kg ha^{-1} at Barani Agricultural Research Institute, Chakwal for two years, 1993-94 and 1994-95. Groundnut pod yield, nodular mass/nodule number, plant N concentration and soil N after harvest of crop were significantly increased due to microbial inoculation during the both years. Higher pod yield, nodular mass/nodule number, and plant and soil N were obtained with the use of Bradyrhizobium sp. (Arachis) as seed treatment along with the diazotroph inoculum as foliage spray. Application of both inocula, on two years average data basis, gave 46.5 per cent maximum increased groundnut pod yield over uninoculated treatment at 10 kg N ha^{-1} fertilizer application. However, seed inoculation alone with Bradyrhizobium showed higher cost : benefit (C: B) ratio at all N fertilizer levels, with its maximum value at 10 kg N ha^{-1} application.