



## DEVELOPMENT OF SLOW RELEASE CARRIER OF PHOSPHORUS TO IMPROVE ITS USE EFFICIENCY

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The concentration of inorganic phosphorus (P) in soil solution is usually much lower than that of the root cells due to its fixation by different soil components. Developing a controlled release technology to reduce P fixation and loss through run-off will therefore be helpful in enhancing P use efficiency in crops. Low molecular organic acids such as oxalic acid or citric acid are known to solubilise fixed P in soil. Hence, these can be used to increase P availability in soil. Therefore, our aim was to develop controlled delivery system using clay and polymer which can be used as a release carrier of different materials like oxalic acid, P and phosphate solubilising bacteria (PSB) in soil to increase P availability. Clay polymer composite (CPC) was synthesized using poly acrylate and bentonite. After synthesis, the polymers were dried in oven at 100° C. Then dried CPCs were loaded with oxalic acid, P and PSB. To assess the response of crop to applied CPC a greenhouse experiment was conducted using wheat as a test crop. Treatment combination consisted of oxalic acid @ 40 ppm, half of recommended dose of P through CPC, PSB through CPC and full recommended dose of P (RDP) through di-ammonium phosphate (DAP) fertilizer. Results indicate that at 45 DAS available P in soil was highest in full RDP through DAP treated pots which was at par with half recommended P through CPC and PSB through CPC treated pots. But at harvest available P was much lower in DAP fertilizer treated pots (5.0 mg/kg) than half recommended P through CPC (7.87 mg/kg), PSB through CPC (8.1 mg /kg) and oxalic acid through CPC (6.8 mg/kg) treated pots. Half recommended P and PSB through CPC and DAP fertilizer were equally effective as far as dry matter yield and uptake were concerned. This indicates that half recommended P applied through CPC is able to maintain soil available P for longer period. Also oxalic acid and PSB applied through CPC can be used to solubilize native soil P. Therefore, CPC can be used as controlled delivery system of nutrients and other agrochemicals to improve nutrient use efficiency.