

Effect of Seed Inoculated Rhizobium on Nodule Formation, Yield and Seed Physical Properties of Cowpea

K.N. Kumara Sharma and A.G.B. Aruggoda[†]

Department of Agricultural and Plantation Engineering, The Open University of Sri Lanka
[†]agbar@ou.ac.lk

Abstract: Soil fertility and productivity depend on soil chemical, physical and biological properties. Sri Lanka is an agricultural country and extensive use of inorganic fertilizers by the farmers has harmful impact on human and the environment. Therefore, promoting application of organic fertilizer is a need. Legumes are not only grown as human food but also improve soil fertility through biological nitrogen fixation. Rhizobium, a soil borne bacteria living in nodules of legume plants, fixes aerial nitrogen on a symbiotic association. Thus it reduces nitrogen requirement of legume and make the legume based cropping system sustainable. The response of cowpea variety Waruni to seed inoculated Rhizobium, cattle manure, and inorganic nitrogen fertilizer was investigated conducting field experiments. The results indicate that the seed inoculated rhizobia increased number of nodules and nodules dry weight per plant, 100 seed weight, number of pods per plant, yield, hydration coefficient and cookability. Control treatment significantly increased total defects and non-soakers. Moisture content was not showed statistically significant different among the treatments. When perform the correlation analyses the moisture content showed non significant effect with other seed physical properties. Cookability showed significant positive correlation with non-soaker seeds and non-soaker seeds showed highly significant ($p < 0.0001$) positive correlation with total defects. Seed inoculated *Rhizobium* had the highest performances in nodule formation, yield and seed physical properties. Present study concludes that the seed inoculated *rhizobium* is successfully applied in legume fertilization as a supplement to the inorganic fertilizer as well as to reduce the amount of organic fertilizer.