Crop Diversification With Ricebean-Based Intercropping Systems For Maximising Productivity, Profitability and Energy Use Efficiency in Rainfed Upland

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ABSTRACT

A field experiment was conducted at the Central Research Station, Orissa University of Agriculture and Technology, Bhubaneswar during *kharif* seasons of 2007 and 2008 to study the performance of ricebean-based intercropping systems in rainfed upland. The soil was well drained loamy sand in texture with acidic reaction (pH - 5.6), low in available N (230.4 kg ha^{-1}), medium in available P (14.6 kg ha^{-1}) and K (164.2 kg ha^{-1}). The experiment comprised of 10 treatments laid out in a randomized block design with 3 replications. The treatments were ricebean (sole), maize (sole), arhar (sole), sorghum (sole), ricebean + maize (2:1), ricebean + maize (4:2), ricebean + arhar (2:1), ricebean + arhar (4:2), ricebean + sorghum (2:1), ricebean + sorghum (4:2). The growth parameters, yield attributes and yield of sole crop of ricebean were significantly higher than ricebean grown in association with maize/arhar/sorghum. Performance of ricebean in association with arhar at 4:2 row ratio was better compared to its association with other crops irrespective of row ratios. The rice bean yield under ricebean + arhar (4:2) was   23.6 % less than sole ricebean (11.52 q ha^{-1}). However, considering the intercropping system as a whole, ricebean + arhar (4:2) excelled all other treatments in terms of system productivity (19.15 q ricebean equivalent yield), land equivalent ratio (1.36), net return (Rs.20,037 ha^{-1}) and energy use efficiency (13.93 q/MJ x 10^3) . The productivity, net return and energy use efficiency under ricebean + arhar (4:2) were 66.2, 121.8 and 56.3% more than sole ricebean, respectively.

Key words : Intercropping system, Sole crop, System productivity, Row ratio.
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