Range Mgmt. & Agroforestry 42 (2) : 286-293, 2021
ISSN 0971-2070

Rice-based cropping system with fodder cowpea to manage weed and improve productivity in Hirakud command areas of Odisha, India

S. Mohapatra*, S.K. Tripathy, A.K. Patra and A.K. Mohanty
RRTTS, Orissa University of Agriculture and Technology, Chiplima-768025, India
*Corresponding author e-mail: sanjukta.mohapatra34@gmail.com
Received: 22nd September, 2020 Accepted: 30th August, 2021

Abstract
A field experiment was conducted at Chiplima, Odisha under irrigated medium land condition during 2016-17 and 2017-18, to evaluate the rice based cropping system with fodder cowpea to control weed and improve crop productivity and profitability in 10 rice based cropping system in Hirakud command areas of Odisha. The results revealed that the total density and dry weight of weeds were the lowest in rice-maize-cowpea (fodder) sequence, but remained at par with rice-groundnut-cowpea (fodder) in *kharif*. During *rabi*, significantly lower density and dry weight of total weeds were recorded in groundnut (rice-groundnut-cowpea fodder), though it was found similar with rice-groundnut-green gram. During summer, cowpea fodder grown in rice-maize-cowpea recorded significantly lower density and dry weight of total weeds. Rice-maize-cowpea (fodder) cropping systems recorded significantly higher rice equivalent yield (19.56 t ha^{-1}) than other systems evaluated, the relative production efficiency being 85.2% over the rice-groundnut system. Rice-maize-cowpea (fodder) had the highest system productivity (53.6 kg rice equivalent yield (REY) ha^{1} day^{-1}), employment generation efficiency (124.7%), followed by rice-groundnut-bottle gourd (51.0 kg REY ha^{1} day^{-1}, 120.5%). It also gave the highest net returns (Rs. 135100 ha^{1}), system profitability (Rs. 370 ha^{-1} day^{-1}), crop profitability (Rs. 500 ha^{-1} day^{-1}), benefit-cost ratio (2.56) and relative economic efficiency (168.5%) compared to rice-groundnut system.

Keywords: Cowpea fodder, Employment generation, Production efficiency, Rice-based cropping system, System productivity, Weed density