DIFFERENT SEED RATES OF SUNN HEMP ON ITS BIOMASS PRODUCTION AND WEED SUPPRESSION IN THE LOWLAND RICE DURING FALLOW PERIOD

P.L.P.B. Nishantha, D.A.U.D. Devasinghe and D.I.D.S. Benaragama

Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura

Sunn hemp (*Crotalaria juncea* L.) is a tropical legume that can be incorporated into crop rotations during fallow period. An experiment was conducted to assess the impact of different seed rates of sunn hemp on the production of green manure biomass and weed suppression capacity during the fallow period in a lowland rice field. This study was conducted in the research field at the Faculty of Agriculture, Puliyankulama from March to July 2017. Two factor factorial experiment was laid in a split plot design with four replicates. Main plot factor was the residual fertilizer level of full dose and half dose of the recommended inorganic fertilizers from the previous cropping. The sub plot factor was different sun hemp seed rates; 0 (fallow), 20 kg/ha, 40 kg/ha, 80 kg/ha. Plant density, plant shoot biomass, plant root biomass, weed density, weed biomass, nodule number and sunn hemp shoot nitrogen content were evaluated. There was no interaction ($p>0.05$) between residual fertilizer level and sunn hemp seed rates on any of the parameters tested. Increasing the seeding rate of sunn hemp from 20 kg/ha to 80 kg/ha increased the shoot and root biomass by 8.9% and 3.9%, respectively. The highest density (99 plants/m^2) and biomass of weeds (89.5 g/m^2) were found in the fallow plots. Compared to fallow, 40 kg/ha sunn hemp seed rate significantly decreased the density and biomass of weeds by 41% and 79%, respectively; whereas 80 kg/ha reduced the same by 62% and 91%. Root nodule number was found to decline with increasing plant density. Although the shoot nitrogen content was not different among treatments, the highest nitrogen content (1.75 ppm) was recorded in 40 kg/ha seed rate. Cost analysis of seeds revealed that 40 kg/ha (SLR. 3,600.00) is more economical to the farmers than 80 kg/ha (SLR. 7,200.00). In conclusion, 40 kg/ha sunn hemp seed rate is more beneficial and economical than the other two tested seed rates for managing weeds during the fallow period in lowland paddy fields.

Keywords: Fallow period, Green manure, Seed rate, Sunn hemp, Weed suppression