

## EFFECT OF DIFFERENT SUNN HEMP SEED RATES AND INOCULATION ON WEED SUPPRESSION AND NODULATION

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Green manuring can be a sustainable alternative to minimize the overuse of inorganic fertilizers in rice cultivation. A field experiment was conducted to evaluate the effect of different seed rates and inoculation of sunn hemp on weed management and nodulation in order to increase its ecological benefits. A factorial experiment with four replicates was established as Randomized Complete Block Design in the research unit of the Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama during June – August 2018 with a seeding rate treatment (0, 20, 40 and 80 kg $ha^{-1}$ ) and rhizobial inoculation treatment (inoculated, control). Plant density, shoot and root biomass, weed density and biomass and nodule number were evaluated. There was no interaction ( $p > 0.05$ ) between inoculation and seeding rates of sunn hemp on any of the parameters tested. However, nodule production of sunn hemp was significantly higher (46%) in the inoculated plots compared to those non-inoculated. Increasing the seed rates of sunn hemp from 20 to 40 kg $ha^{-1}$  and 40 to 80 kg $ha^{-1}$  significantly increased the plant density by 113% and 75%, respectively. The increasing seed rate of sunn hemp from 20 to 40 kg $ha^{-1}$  increased the plant shoot and root biomass by 76% and 77%, respectively. When increasing the seed rates from 40 to 80 kg $ha^{-1}$  significantly increased the shoot and root biomass by 129% and 125%, respectively. Furthermore, compared to fallow, seed rate of 20, 40 and 80 kg $ha^{-1}$  significantly decreased the density of weeds by 34%, 48% and 70%, respectively and decreased the weed biomass by 27%, 25% and 35%, respectively. It is concluded that the increasing the seed rates of sunn hemp than the recommendation of 20 kg $ha^{-1}$  found to be highly beneficial but the effect of inoculation need to be further explored.

**Keywords:** Green manure, Inoculation, Nodulation, Seed rate, Sunn hemp