tinggi. Tanaman penutup tanah kacang-kacangan dapat mengembalikan hara lewat seresah dan menyemat nitrogen dari udara, sehingga mampu menjaga stabilitas N-total dalam tanah, meningkatkan K-tersedia bagi tanaman, tetapi tidak mampu meningkatkan P-tersedia bagi tanaman. Produksi biomassa berhubungan erat dengan persentase bahan organik, dan jumlah dan berat kering bintil akar. Produksi seresah berhubungan erat dengan pH tanah, persentase bahan organik, jumlah kation basa tertukarkan, persentase kejenuhan basa, N-total dalam tanah, P-tersedia dan berat segar bintil akar.

CONTRIBUTION OF LEGUME COVER CROPS TO SOIL NUTRIENT STATUS IN THE SPECIAL SMALL-HOLDER NUCLEAR ESTATE I TRANSMIGRATION AREA IN TANJUNG SANTAN, EAST KALIMANTAN

by

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ABSTRACT

The planting of legume cover crops is expected to contribute to the maintenance of soil fertility as they protect the soil surface from exposure to rainfall and wind, and to maintain and even improve soil nutrient status through the litter fall they produce and through their ability to fix atmospheric nitrogen. This study was conducted to find out how much biomass and litter fall, as well as its nutrient content, could be produced by legume cover crop at varying age when they are planted in areas differing in slopes. This study is also intended to find out the effects of cover crop and slope on the production of root nodules. Besides, it is also intended to examine how environmental factors, plant age, and root nodule production relate to biomass and litter fall production of the legume cover crops.

A split plot design was adopted with plant ages of 3 8, 24 - 29, 36 - 41, and 48 - 53 month old assigned to the main plots and slopes of 0 - 5, 6 - 10, 11 - 15, 16 20, and 21 - 25 % to the sub plots.

The results showed that with increasing plant age from 3 - 8 month to 24 - 29 month, biomass and litter fall production was significantly increased, but further increase in age to 36 - 41 and 48 - 53 month resulted in a significant decrease in biomass production and a relatively constant litter fall production. The maximum production of biomass and litter fall was obtained from soil with 0 - 5 % slope. With increasing slope, the production of biomass and litter fall tended to decrease. Maximum root nodule was obtained from cover crops planted in area with 0 5 % slope. Number, fresh weight and dry weight of root nodules decreased significantly with increasing plant age. No significant effect of slope was observed on either fresh weight or dry weight of root nodules. However, it significantly influenced number of root nodules. Plants of 3 - 8 month old planted in area with 21 - 25 % slope gave the highest number and dry weight of root nodules. As legume cover crops returned nutrients to the soil through the litter fall they produced - and fixed nitrogen

from the atmosphere, they had the ability to maintain a stable total nitrogen in the soil, and to increase the availability of potassium - but not phosphorus - to the plants. Plant biomass production is related to percentage of organic matter, and number, and dry weight of root nodules, whereas litter fall production is a function of soil pH, percentage of organic matter, sum of exchangable bases, base saturation percentage, total nitrogen, available P, and fresh weight of root nodules.