

## **Effect of different legumes as improved fallow, in combination with or without poultry manure, on soil and water losses of an alfisol in the Central Valley of the Yaracuy River, Venezuela.**

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Soil and water conservation practices aiming at improving the agricultural production of degraded land, is of prime importance and interest in Venezuela. The potential of legumes as improved fallow was evaluated with two experiments on an alfisol in the Central Valley of the Yaracuy River, Venezuela.

The first experiment aimed at evaluating the effect of four different legumes, in two crop systems, and subsequent surface residues, as improved fallow and this as a soil and water conservation practice. Among the parameters evaluated were the plant and canopy height of the legumes and weeds, the degree of canopy cover and soil cover, the fresh and dry weight of legumes and weeds, the decomposition rate and the C/N ratio. The second experiment was carried out under simulated rainfall for evaluating the effect on soil and water losses of the type of legumes and the amounts of residues (1.5 and 3 Mg.ha<sup>-1</sup>) with or without poultry manure (1.5 Mg.ha<sup>-1</sup>). An improved fallow was obtained by mixing different proportions of legumes and natural fallow (0%, 25%, 75%). The first experiment showed significant differences between the types of legumes and this for all the considered parameters. *Crotalaria juncea* was considered as best performing in terms of soil protection. During the dry season an important reduction in dry matter was observed, probably due to the low water availability. *Crotalaria juncea* also decomposed at a slower rate as compared to the other legumes. The second experiment showed that the treatments without manure (3 Mg.ha<sup>-1</sup> of residues and 25% and 75% of mixing with fallow) reduce the soil losses by 79% and 76% as compared to the treatment of the bare soil with 1.5Mg.ha<sup>-1</sup> manure. *Crotalaria juncea* with 3 Mg.ha<sup>-1</sup> manure and 75% mixing with residues reduces soil losses by 84% and water losses by 69% as compared to the bare soil. *Crotalaria juncea* in combination with manure resulted in the highest reduction in soil and water losses and the protective effect improved when the residues were combined with manure. *Crotalaria* is a potencial plant for use as improved fallow residues.

**Key words:** Venezuela, Leguminous, Improved fallow, *Crotalaria*, Soil and water losses.

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