

Alley cropping *Sesbania sesban* (L) Merrill with food crops in the highland region of Rwanda

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Abstract Food production in the densely populated Rwandan highlands is impeded by soil erosion and loss in fertility. Alley cropping leguminous shrubs with food crops on contours is purported to minimize the problem and to provide wood and forage. This study reports the effect of *Sesbania* prunings plus moderate levels of N and P on bean (*Phaseolus sp*) and maize (*Zea mays*) yields in alley cropping. Experimental design was a randomized complete block with split-split plots. Main plots were alley width: 2, 4, 6 and 8 m. Phosphorus (P) at 0, 30 and 60 kg P₂O₅/ha occupied the subplot and nitrogen (N) at 0, 30 and 60 kg/ha were assigned at the sub-sub plot level. No P was applied to maize during the second cropping season. Crop yield in kg/ha included the land space taken by hedgerows. Bean yield in 6 m alleys (1100 kg/ha) was about twice that in 2 m alleys (500 kg/ha). Bean responded to N and P. Optimum alley width and N for bean yield were 6 m and 30 kg/ha, respectively. Cuttings from alley hedgerows provided stakes for climbing beans. Maize responded to N but not to residual P. The highest maize yield came from 8 m alleys with 40 kg/ha, but yields from 8 and 6 m alleys with the same N treatment were not significantly different. Maize plants in middle rows were significantly taller than plants in rows adjacent to hedgerows. Maize rust development showed significant alley width and row position effect. There were significantly fewer uredinia in the *Sebania* alleys relative to the control plots without shrub hedgerows. Rust development on maize in middle rows was significantly greater than development in border rows.