



## Optimizing Growth and Yield of intercropped Maize, Pigeonpea and *Gliricidia* in Kongwa and Kiteto Districts, Tanzania

Jonas, E.<sup>1</sup>, Kimaro, A.A.<sup>1\*</sup>, Mwakalupwa, E.<sup>1</sup>, Lulandala, L.<sup>1</sup>, Swamila, M.<sup>1</sup>, and Okori, P.<sup>2</sup>

<sup>1</sup>World Agroforestry Centre (ICRAF), Dar es Salaam - Tanzania

<sup>2</sup>International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Lilongwe- Malawi

\*Corresponding author: Kimaro A.A., [A.Kimaro@cgiar.org](mailto:A.Kimaro@cgiar.org)

### Abstract

Low crop yields and limited supply of high quality livestock feeds are among the main development challenges facing farmers in semi-arid Tanzania. To address these problems, farmers under the Africa RISING project in Kongwa and Kiteto Districts are integrating maize, pigeonpea and *Gliricidia sepium*. Pigeonpea is a fairly new legume crop in these Districts, requiring both adaptability and agronomic studies to guide farmers on the best technology options, which can optimize farm productivity. We employed the participatory variety selection approach to identify adaptable pigeonpea varieties. These were then tested on farms in Mlali and Chitego (Manyusi) villages under various intercropping arrangements with maize (Pure stands, 1:1, 1:2 and 2:1) and/or *G. sepium* (Pure stands, Maize+Pigeoepa, Maize+Pigeoepa+Gliricidia) to assess options for optimizing growth and yields of crops and fodder. Two pigeonpea varieties (ICEAP0057 and ICEAP 0054) were selected by farmers based on superior growth and grain yield. Maize grain yield ranged from 1.20-2.04t/ha in Mlali and from 1.24-3.25t/ha in Chitego, reflecting higher potential in the latter site. Relative to monoculture, yield of maize was reduced (28-40% in Mlali and 2-62% in Chitego) with the highest reduction noted for with increasing pigeonpea proportions. At 1:1 ratio, reduction was modest and ranged from 30-40% in both sites. Similar trends were noted for pigeonpea grain yield. Land Equivalent Ratio (LER) was above 1 in all cropping combinations (ratios), suggesting that intercropping was more efficient in utilizing land resources for sustained productivity. Increasing the proportions of pigeonpea in maize based systems was more beneficial to farmers in less potential sites (LER = 1.53) than in high potential sites (1.15) at 1:2 ratio of Maize and pigeonpea intercropping. At higher potential sites, farmer can benefit more by having larger proportion of maize than pigeonpea (1.06 versus 1.71). Thus, pigeonpea intercropping at the appropriate proportions based on local site conditions is necessary and a promising strategy to optimize yields in mixture and increasing resilience of farming systems. Economic assessment is going on to come up with the attractive and profitable intercropping systems for out scaling purposes.

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