Intercropping strategies under CA: Africa RISING science, innovations and technologies with scaling potential from ESA-Zambia

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Key messages
✓ Intercropping maize with *Gliricidia sepium* with no fertilizer provides benefits for the associated maize in the range of 66%
✓ Intercropping lablab with maize can generate immediate yield benefits under no fertilization but only if the lablab is intercropped 3 weeks later than maize to reduce competition
✓ Intercropping maize with legumes offers many benefits e.g. increased groundcover, weed control, improved soil fertility, fodder, diversification of income and nutrition.

Objectives and approach
Farmers in eastern Zambia face production constraints due to declining soil fertility, degradation and the negative effects of climate variability and change. To sustainably increase productivity, a range of intercropping options were tested in maize-based conservation agriculture systems including grain legumes, green manures and agro-forestry species. These were tested both on-farm and on-station in replicated trials across farms in Chipata and Lundazi and at the Msekera Research Station in Eastern Zambia.

Key results
Yield results across farms (n=264) with *Gliricidia* intercropping systems of different age (e.g. two and four years) on two contrasting soil types showed yield benefits of 66% between unfertilized *Gliricidia*-maize intercropping and an unfertilized control with sole maize (Figure 1, Picture 1). However, yield benefits were much greater between fertilized maize and the unfertilized control.

Maize-lablab intercropping under no fertilization showed greater yield benefits than intercropping with pigeonpea (Figure 2). However this was only significant if the lablab planting was delayed by 3 weeks. Under fertilization there was no difference between treatments (Figure 2).

Significance and scaling potential
Intercropping may provide cash constrained farmers an option to increase soil fertility without depending on mineral fertilizer only. In conservation agriculture systems, intercropping provides additional benefits (i.e. ground cover, weed control, additional income from intercrops, erosion control, increased nutrition amongst others).

Both COMACO and CRS have targeted large numbers of smallholder farmers with different intercropping strategies (>150,000 farmers) and the data generated by Africa RISING will provide the necessary evidence and support these attempts.