# The potential of *Canavalia Brasiliensis in* Integrated Soil Fertility Management in Semi-Arid Environment in Tanzania

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# Special features of Canavalia brasiliensis

- Introduction

Biophysical,Climate,and Human factors have increased soil fertility degradation in the Miombo woodland ecosystems

- Biological characteristics of Canavalia brasiliensis
- Drought tolerance
- Deep penetration in soil
- High biomass production
- N input in the soil
- Improved water infiltration
- Soil surface cover against soil erosion
- Protecting the soil surface against solar influxes improves the biological activity of soils

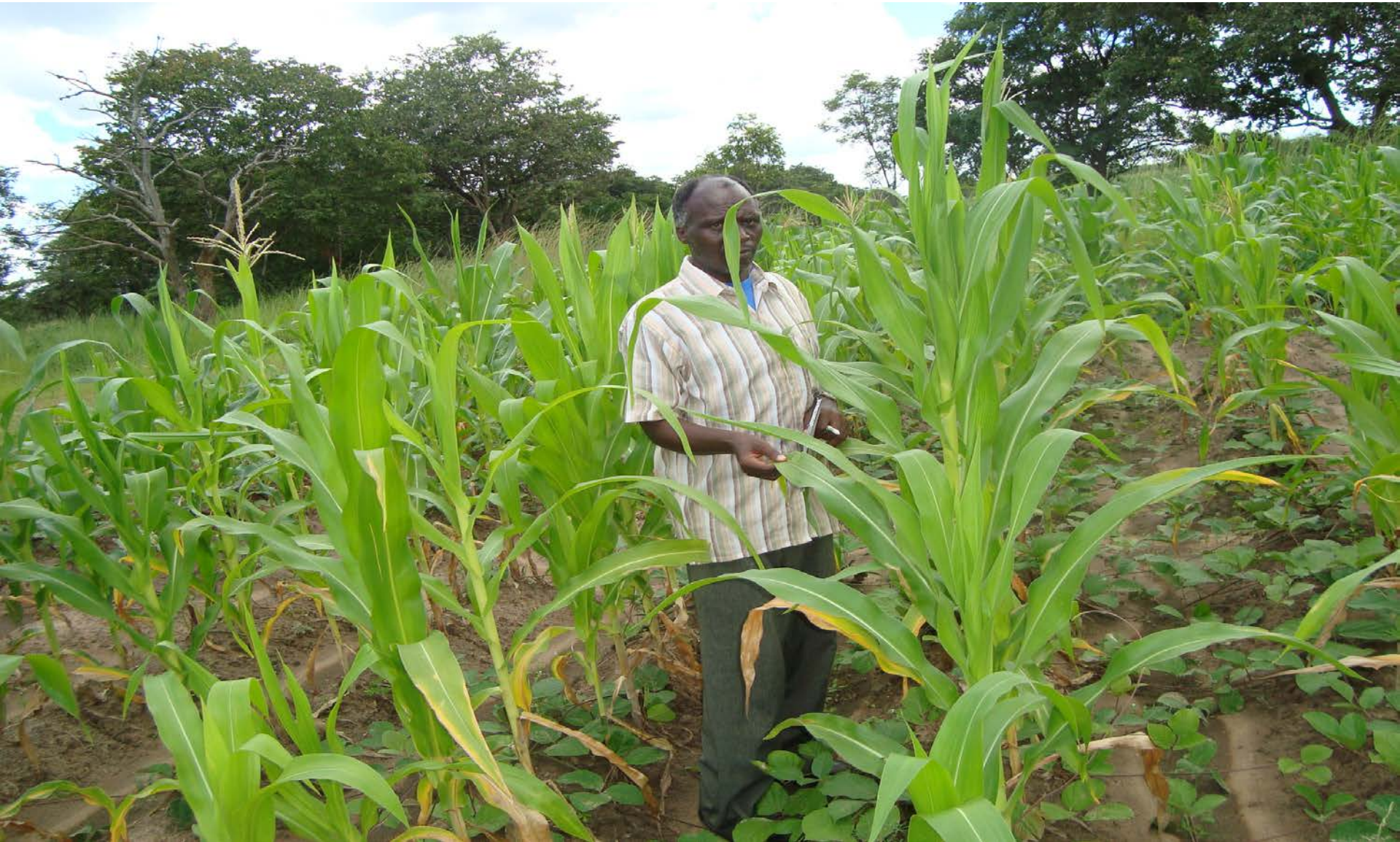
# Objectives

- To test potential of Canavalia brasiliensis as the component of ISFM in the semi-arid Miombo woodland system in Tabora Tanzania
- To study the opportunities of improving crop residues fodder quality with Canavalia brasiliensis in the dry season.

# Materials and methods

- The research was conducted at Tumbi Agricultural Research Institute  farm, S $05^{0}$03’57.9 E $032^{0}$40’04.8’’ 1152m asl Tabora region in Tanzania. The soil at the experimental site is classified as a Ferric acrisols (Palexerults;USDA taxonomy).
- Field trials comparing different green manure with NPK(YARA) Mila cereal
- Growing maize in rotation with Canavalia brasiliensis

Late planted Maize under sown with Canavalia brasiliensis at Tumbi,Tanzania



# Maize grown on rotation with Canavalia brasiliensis+ NPK YARA

# Maize crop residues- Canavalia brasiliensis(protein source) in the dry season(July) leads to high quality manure

# Canavalia brasiliensis after two consecutive seasons under semi-arid conditions in Tabora

# Effective nodulation of Canavalia brasiliensis in Tabora

# Deep rooting Canavalia brasiliensis is a biological sub-soil tillage mechanism which improves water infiltration

# The effect of green manure on maize grain yield on a low fertile soil

| Treatments | Maize grain(kg/ha) | Maize stover(kg/ha) |
|---|---|---|
| Control | 1889a | 1568a |
| Grilicidia sepium(10t/ha) | 4407b | 3852b |
| Canavalia brasiliensis(10t/ha) | 3578b | 2617a |
| Chamaecrista rotundifolia(10t/ha) | 2592a | 2210a |
| NPK(YARA) 100kg/ha | 3484b | 3148b |
| LSD 0.05 | 1436.8 | 1067.8 |

# Conclusions

- Benefits of including Canavalia brasiliensis in ISFM under semi-arid environment
- Production of high N biomass 18-50 tons/ha
- Soil moisture improvement and reduction of soil erosion
- Nitrogen input into the soil
- Easy to establish under semi-arid and low fertile soils