

## GLIRICIDIA INTERCROPPING IN MAIZE FARMING

Gliricidia intercropping is a practice in which *Gliricidia sepium* trees and crops are cultivated on the same land area as agricultural crops. They also contribute to livestock feed. Gliricidia intercropping into maize cropping combines trees and crops to increase diversity, productivity, profitability, and environmental management. This is relevant for resource constrained smallholder farmers.

2022  
1st Edition

The sustainable intensification initiatives of Southern Africa use *Gliricidia sepium*, a leguminous tree species which is well adapted to the environment for their sustainable intensification practices. The importance of this system is to grow the trees in hedge rows or as dispersed trees so that leaves can be utilized in a “chop and drop” fashion with limited labour needed for transporting the biomass from one plot to the other. The spatial arrangement also aims at keeping the competition as low as possible while reaping the benefits of the agro-forestry species.

Maize-Gliricidia hedge-row and Maize-Gliricidia disbursed shading are the two main systems. In the first one, maize-legume rotations are planted at normal plant population, in addition, hedgerows of Gliricidia trees are planted in rows spaced 5 m apart with an in-row spacing of 1 m. In the second, the disbursed shading system aims at developing larger Gliricidia trees that provide shade, less competition and in addition some green leaves that can be applied to the soil after pruning every year. One tree is usually planted every 10 m in rows 5 m apart.



### INNOVATION TYPOLOGY



THIS INNOVATION IS CHARACTERIZED AS  
**Technological Innovation**

Innovations of technical/material nature, including varieties/breeds; crop and livestock management practices; machines; processing technologies; big data and information systems.



THE NATURE OF THIS INNOVATION IS  
**Incremental Innovation**

Innovations that already exist and undergo constant, steady progress and improvement.



## THIS INNOVATION IS EXPECTED TO CONTRIBUTE TO THE FOLLOWING IMPACTS

### CGIAR IMPACT AREAS AND COLLECTIVE GLOBAL TARGETS

	<b>Nutrition, health &amp; food security</b>	<b>1</b>
Targets: 1.1		
	<b>Poverty reduction, livelihoods &amp; jobs</b>	<b>2</b>
Targets: 2.1   2.2		
	<b>Gender equality, youth &amp; social inclusion</b>	<b>3</b>
Targets: 3.1   3.2		
	<b>Climate adaptation &amp; greenhouse gas reduction</b>	<b>4</b>
Targets: 4.1   4.2   4.3		
	<b>Environmental health &amp; biodiversity</b>	<b>5</b>
Targets: 5.1   5.2		

Learn more: <https://www.cgiar.org/how-we-work/strategy>

### SDGs AND SDG TARGETS

	<b>End poverty in all its forms everywhere</b>	<b>1</b>
Targets: 1.1   1.2   1.4   1.5   1.b		
	<b>End hunger, achieve food security and improved nutrition and promote sustainable agriculture</b>	<b>2</b>
Targets: 2.1   2.2   2.3   2.4   2.5   2.b   2.c		
	<b>Ensure healthy lives and promote well-being for all at all ages</b>	<b>3</b>
Targets: 3.9		
	<b>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</b>	<b>4</b>
Targets: 4.3   4.4		
	<b>Achieve gender equality and empower all women and girls</b>	<b>5</b>
Targets: 5.5   5.a   5.b		
	<b>Ensure sustainable consumption and production patterns</b>	<b>12</b>
Targets: 12.1   12.2   12.3   12.4		
	<b>Take urgent action to combat climate change and its impacts</b>	<b>13</b>
Targets: 13.1   13.2   13.3   13.a   13.b		
	<b>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</b>	<b>17</b>
Targets: 17.1   17.3		

Learn more: <https://sdgs.un.org/goals>



## CGIAR INITIATIVES, PARTNERS AND GEOSCOPE

### CGIAR LEAD INITIATIVE

**Ukama Ustawi: Diversification for resilient agribusiness ecosystems in East and Southern Africa (ESA)**

### CGIAR CONTRIBUTING INITIATIVE(S)

**Excellence in Agronomy for Sustainable Intensification and Climate Change Adaptation (EiA)**

THIS INNOVATION IS DEVELOPED, TESTED AND/OR SCALED FOR/IN THE FOLLOWING COUNTRIES



### TYPE OF PARTNERS / PARTNERSHIPS

- National Government
- Local Government
- Other Public Sector
- International NGO
- National NGO
- Regional NGO
- Private Sector in Provider Country
- Academic, Training and Research



## CURRENT INNOVATION READINESS

9

### PROVEN INNOVATION

The innovation is validated for its ability to achieve a specific impact under uncontrolled conditions

8

### UNCONTROLLED TESTING

The innovation is being tested for its ability to achieve a specific impact under uncontrolled conditions

7

### PROTOTYPE

The innovation is validated for its ability to achieve a specific impact under semi-controlled conditions

6

### SEMI-CONTROLLED TESTING

The innovation is being tested for its ability to achieve a specific impact under semi-controlled conditions

5

### MODEL/EARLY PROTOTYPE

The innovation is validated for its ability to achieve a specific impact under fully-controlled conditions

4

### CONTROLLED TESTING

The innovation is being tested for its ability to achieve a specific impact under fully-controlled conditions

3

### PROOF OF CONCEPT

The innovation's key concepts have been validated for their ability to achieve a specific impact

2

### FORMULATION

The innovation's key concepts are being formulated or designed

1

### BASIC RESEARCH

The innovation's basic principles are being researched for their ability to achieve a specific impact

0

### IDEA

The innovation is at idea stage



## ACKNOWLEDGEMENTS

We would like to thank all Funders who support this innovation through their contributions to the **CGIAR Trust Fund** (<https://www.cgiar.org/funders/>).

This Innovation Profile was prepared with support from CGIAR's Portfolio Performance Unit (PPU), and the author thanks the CGIAR Innovation Packages and Scaling Readiness (IPSR) team for their valuable contributions.



## MORE INFORMATION

### WEBSITES AND DOCUMENTATION

- <https://www.cgiar.org/research/publication/sustainable-intensification-practices-for-smallholder-farmers-in-zambia-a-farmers-manual/>
- <https://repository.cimmyt.org/xmlui/handle/10883/21741>

### CONTACT PERSON

For more information on this innovation please contact **Dr. Christian Lutz Thierfelder** ([c.thierfelder@cgiar.org](mailto:c.thierfelder@cgiar.org))



© 2022 CGIAR System Organization. Some rights reserved.

This work is licensed under a [CC BY-NC 4.0 license](https://creativecommons.org/licenses/by-nc/4.0/).

### CITATION

Thierfelder, C. 2022. *Gliricidia intercropping in maize farming: IPSR Innovation Profile. First edition, December 2022. Montpellier: CGIAR System Organization.*  
<https://hdl.handle.net/10568/125402>

### INNOVATION READINESS JUSTIFICATION

Evidence from research in Zambia and Malawi clearly highlights the beneficial effects of Gliricidia leaf prunings on soil fertility and animal nutrition. It has been widely published and research is underway to further document the effects of this system.

### EVIDENCE SUPPORTING THE INNOVATION READINESS LEVEL

[bit.ly/3Smi1XU](https://bit.ly/3Smi1XU)

[bit.ly/3qWYf9B](https://bit.ly/3qWYf9B)

[bit.ly/3r1agLw](https://bit.ly/3r1agLw)

[bit.ly/3LxUSj9](https://bit.ly/3LxUSj9)

[bit.ly/3duet7m](https://bit.ly/3duet7m)

[bit.ly/3QY9IG8](https://bit.ly/3QY9IG8)

[bit.ly/3dDzkF1](https://bit.ly/3dDzkF1)

[bit.ly/3dudf5tH](https://bit.ly/3dudf5tH)

[bit.ly/3qZn0C5](https://bit.ly/3qZn0C5)