

## DOUBLED-UP LEGUME SYSTEMS ROTATED WITH CEREALS IN SOUTHERN AFRICA

Doubled legume systems respond to a major principle of sustainable intensification which is to increase crop yields per unit land area, without negative effects on the environment. This is achieved in doubled-up legume systems where several legumes are strategically combined in the same planting space.

2022  
1st Edition

The doubled-up legume system involving groundnuts and pigeon pea, comes across as being a perfect combination as the groundnuts only exploit the shallow soil profile and mature relatively faster whereas pigeon peas develop much slower while being deeper-rooted, leading to less competition in the system. Pigeon peas mature at least 2-3 months after the groundnuts, usually providing an increase in overall grain yield from both crops. Pigeon peas also add a large amount of slow decomposing biomass, besides nitrogen rich leaves and stems, which can be used partially as surface mulch or firewood. This benefits the whole cropping system and the household.



### 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		
	<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		

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.a   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.c		
	<b>Ensure healthy lives and promote well-being for all at all ages</b>	<b>3</b>
Targets: 3.2		
	<b>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</b>	<b>4</b>
Targets: 4.4		
	<b>Achieve gender equality and empower all women and girls</b>	<b>5</b>
Targets: 5.b		
	<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>15</b>
Targets: 15.2   15.a		
	<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: 17.7		

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)**  
**Sustainable Intensification of Mixed Farming Systems (SI-MFS)**

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
- 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/>).



## 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))

### PLEASE REFER TO THIS INNOVATION PROFILE AS

Thierfelder C., 2022. Doubled-up legume systems rotated with cereals in southern Africa. Innovation Packages and Scaling Readiness (IPSR) Innovation Profile. CGIAR, October 2022. <https://hdl.handle.net/10568/125519>

### INNOVATION READINESS JUSTIFICATION

Doubled-up legume systems have been tested since the last 20 years and have provided ample evidence shared.

### EVIDENCE SUPPORTING THE INNOVATION READINESS LEVEL

[bit.ly/3yiMjU3](https://bit.ly/3yiMjU3)

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