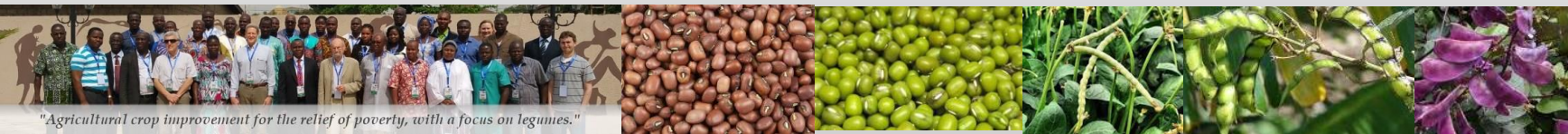




# Stress Tolerant Orphan Legumes (STOL) project in Burkina Faso

Stol project annual meeting. 28<sup>th</sup> August -1<sup>st</sup> September 2024. New Delhi

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**Co-PI** : Zida W. Felicien  
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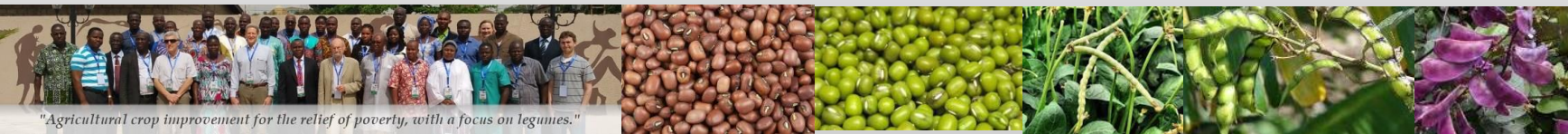


## INTRODUCTION

Following STOL-crops introduction and several experimentation in Burkina Faso four (04) mung bean lines and two (02) dolichos lines have been selected for registration.

These line have been selected through years, after different steps of multi-location tests and participatory selection.

For this rainy season, DUS test of these varieties is the main focus of STOL project activities in Burkina Faso this year.



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## Background

For two years (2019 and 2020). fifty genotypes of mung bean, dolichos, horsegram, rice bean, moth bean and tepari bean introduced from IBPGR were tested at Kamboinsé research station.



During field days in 2019 and 2020. Invited farmers and researchers gave their impressions regarding these crops . and farmers chose mung beans and dolichos for their fields.



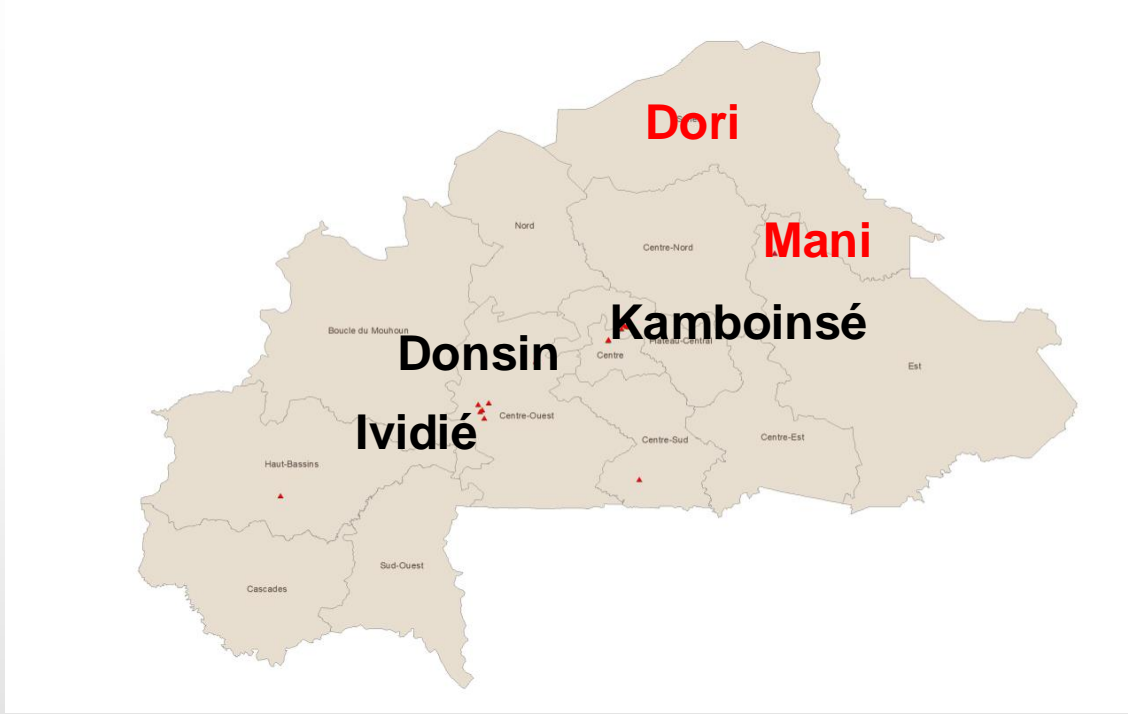
# Scientific activities

**20 genotypes** of mung bean and **17 genotypes** of dolichos were then selected based on their good performance on-station

These genotypes were tested during 2021 and 2022 rainy season.

Mung bean	dolichos
IC-39465	HA 3
COGG-912	IC-0623094
IPM-99-125 (Meha)	HA 17-2
IC103785	IC-0623093
IC-39427	IC-0623099
IC-39483	HA 17-4
IC-39492	IC-06230100
RMG-62	HA 17-3
SML-832	D-167(check)
SAMRAT	IC-0623095
IC-103245	HA-17-1
GANGA1	IC-0623098
IPM-409-4	HA4
MH-2-15	IC-0623096
RMG-492	HA10-2
IC-39395	IC-0623092
IPM-02-14	
Keshwanad Mung1	
Keshwanad Mung2	
IC-39368	

Locations	Rainfall (mm)
Dori	456
Mani	490.3
Ividié	843.1
Donsin	823.25



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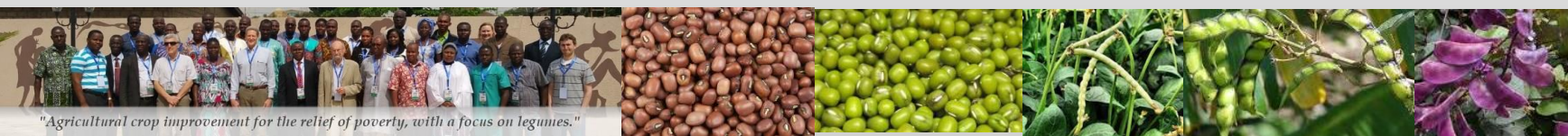
**3** mung bean and **2** dolichos lines were selected as the best in farmer's field during participatory selection and based on performances.

4 mung bean lines from AVRDC were added to the group following a collaborative approach with this institution

MUNG BEAN ( <i>Vigna radiata</i> )		
N°	Lines	Origin
1	IC-103245	NBPGR
2	AVMU 1656	AVRDC
3	AVMU 1657	AVRDC
4	IPM 02-14	NBPGR
5	GANGA 1	NBPGR
6	AVMU 1621	AVRDC
7	<b>Beng-tigré (Check)</b>	INERA
8	AVMU 1614	AVRDC

DOLICHOS ( <i>Lab-lab purpureus</i> )		
N°	lines	Origin
1	IC0623093	NBPGR
2	HA3	NBPGR
3	<b>D167(Check)</b>	NBPGR

These genotypes were subjected to multi-location trials in Mani, Kamboinsé, Saria, Tita and Donsin in order to identify the most widely adapted.



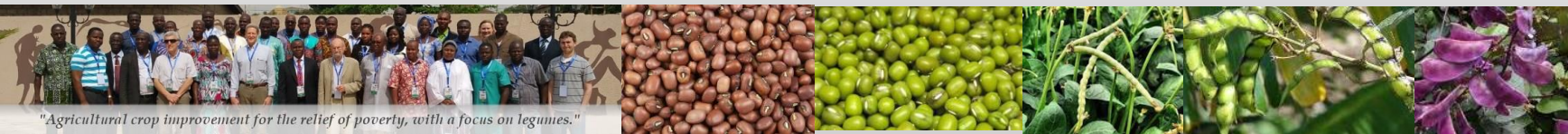
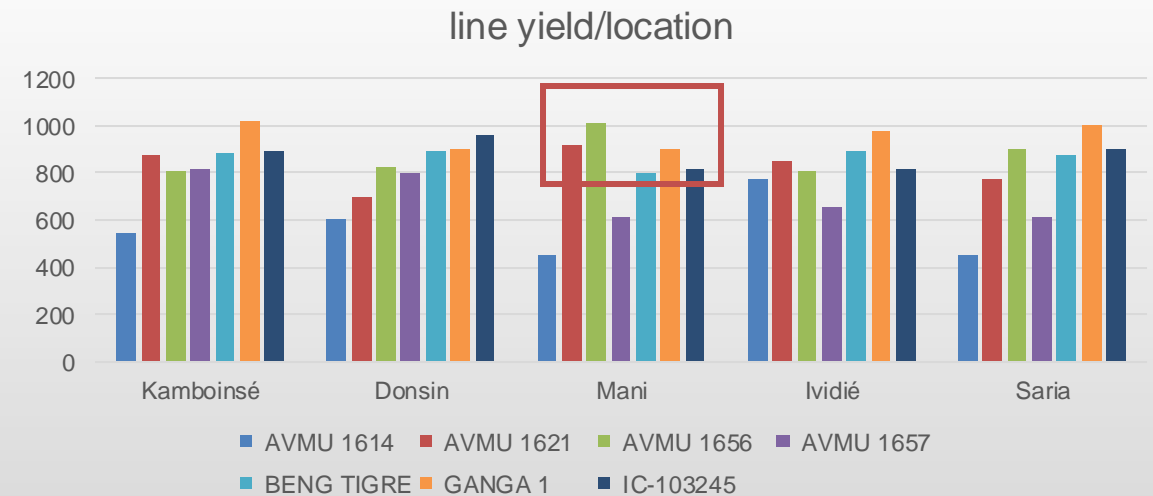
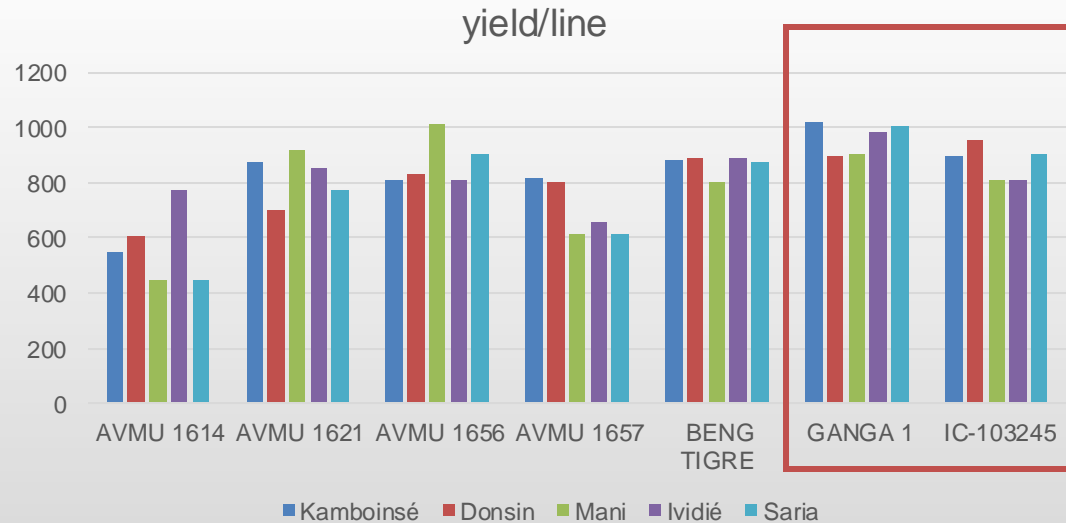
# Results

## Mung bean

varieties selected for registration:

**Ganga1; IC10245; AVMU 1621 and AVMU1656**

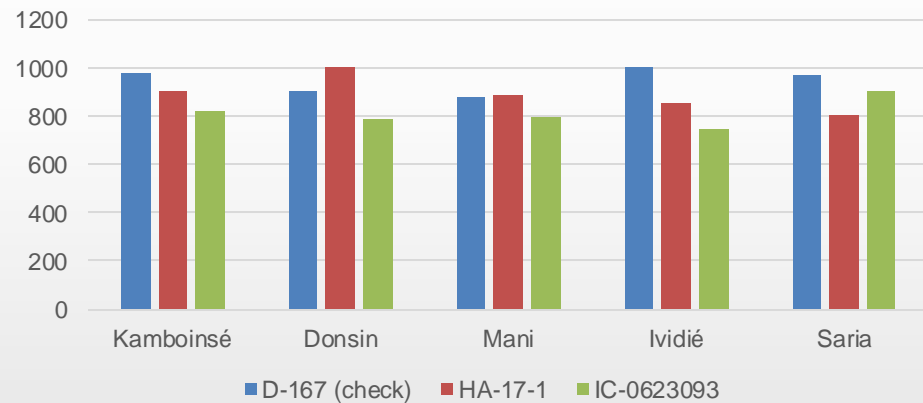
Lines	Yield(Kg/ha)				
	Kamboins é	Donsin	Mani	Ividié	Saria
AVMU 1614	548.02	608.02	448.02	771.02	448.02
AVMU 1621	873.12	700.12	915.95	852	773.12
AVMU 1656	807.9	827.8	1010.2	807.9	900.5
AVMU 1657	814.01	800	612.01	655.8	614.01
<b>BENG TIGRE</b>	<b>882.7</b>	<b>890.4</b>	<b>802.7</b>	<b>890</b>	<b>872.7</b>
GANGA 1	1016.13	898.92	900.4	980.13	1003.13
IC-103245	896.1	958	812.8	812.8	900.8



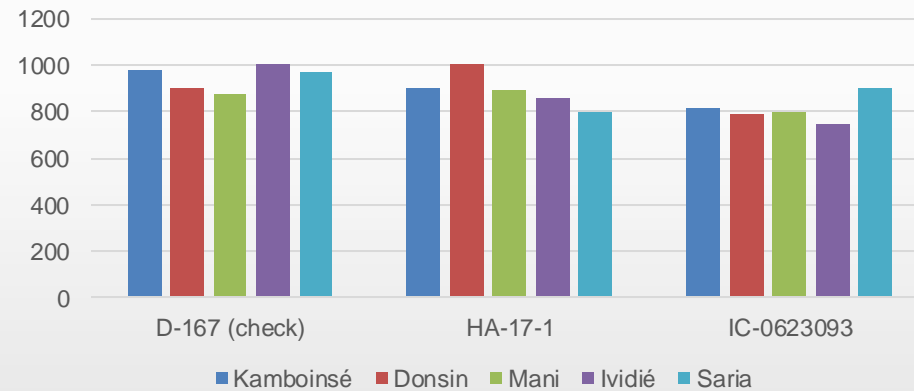
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Lines	Yield/Line (Kg/ha)				
	Kamboinsé	Donsin	Mani	Ividié	Saria
D-167 (check)	975.5	900.86	875.1	1001.5	970.5
HA-17-1	901.75	1001.75	890.33	855.77	800.88
IC-0623093	818.1	789.1	798.66	747.9	899.5

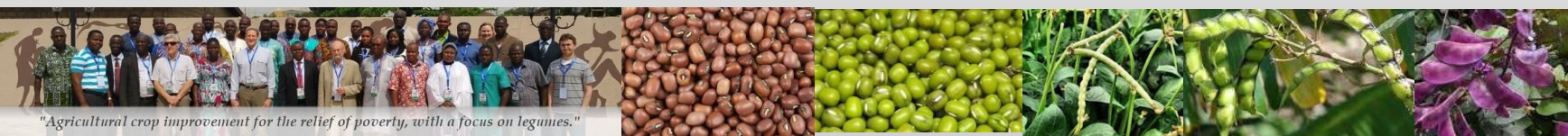
Yield per Location



Yield per line



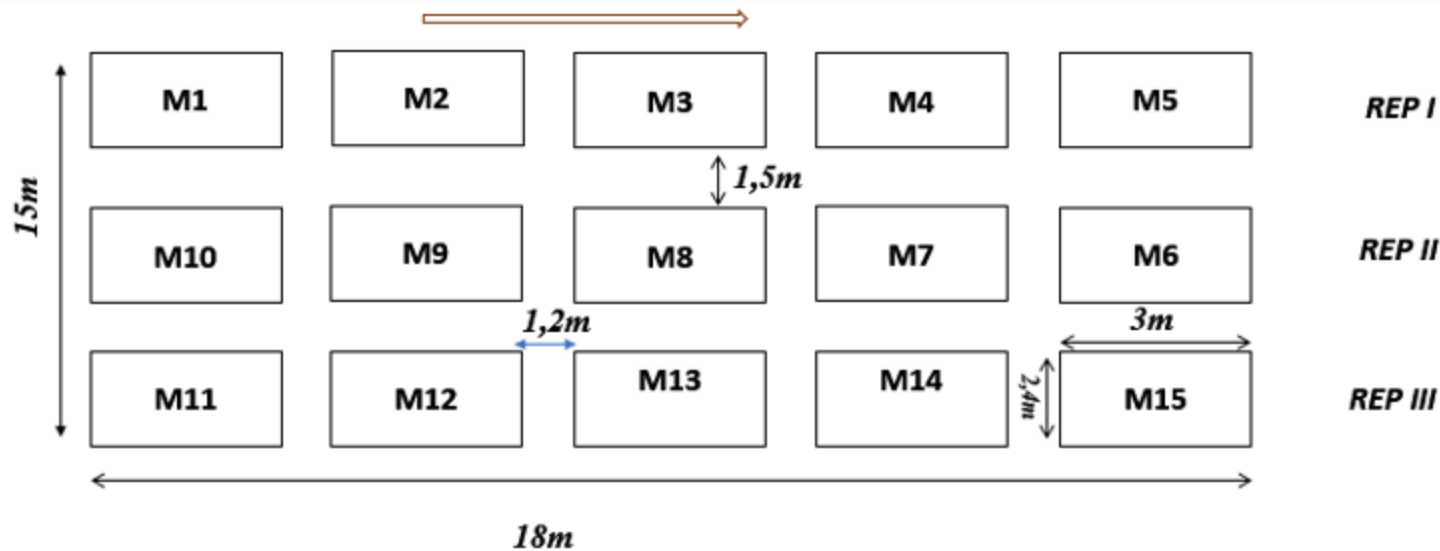
-Multi-locations trial of mung beans (*Vigna radiata*) and dolichos (*Lab-lab purpureus*) lines as a key step of their registration as varieties release in the country



# Current activities

The chosen genotypes of mung bean and dolichos were planted in five locations (Kamboinsé, Saria, Tita, Donsin and Mani) following DUS recommendations:

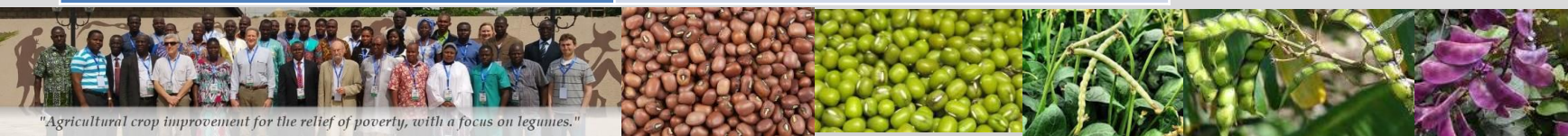
## Field layout for mung bean



## Experimentation details

Details	Dimensions
Area	18×15
Number of lines per plot	4 lines
Length of plot (Row)	3m
row spacing	60cm
Spacing within rows	30cm
Spacing between block	1,5m
Spacing between plots	1,2m
Number of replicates	3
Edges	2m

Genotypes	Code
IC103245	M1 M6 M13
BENG-TIGRE	M2 M8 M14
GANGA 1	M3 M9 M15
AVMU1656	M4 M10 M12
AVMU1621	M5 M7 M11





Trial at germination stage in Kamboinsé research station after two weeks



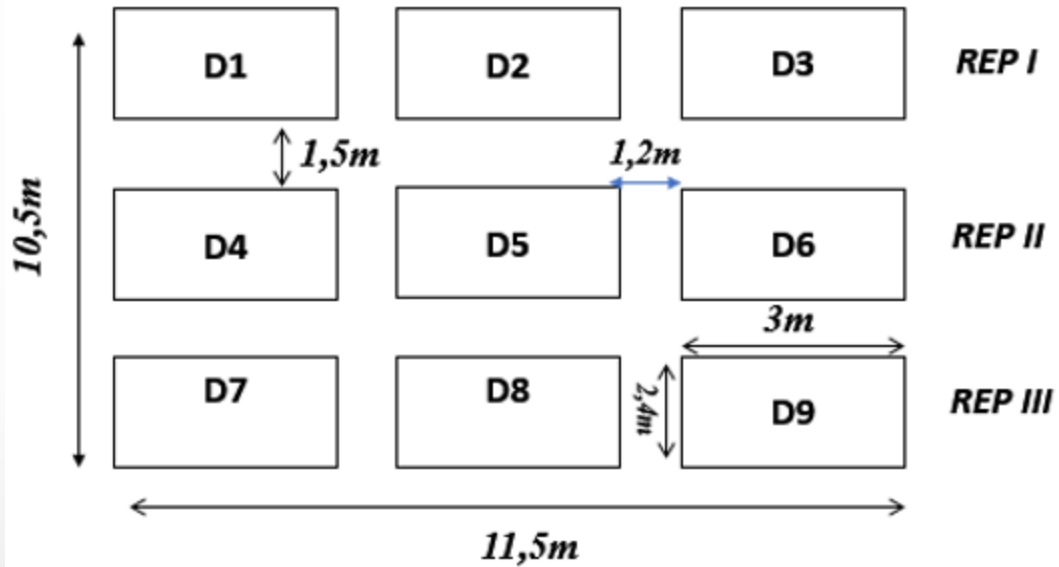
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# Field layout for Dolichos



Details	Dimensions
Area	<b>11,5×10,5</b>
Number of lines per plot	4 lignes
Length of plot (Row)	3m
row spacing	60cm
Spacing within rows	30cm
Spacing between block	1,5m
Spacing between plots	1,2m
Number of replicates	3
Edges	2m

Genotypes	Code
IC0623093	D1 D4 D8
D167	D2 D6 D9
HA3	D3 D5 D7



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# DATA

Qualitatives data	Quantitatives data
Hypocotyl color	Germination rate
Petiol pubescence	Growth speed
Stem pubescence	Number of days to first flowering
Growth habit	Number of days to 50% Flowering
Petiol color	Number of da to 95% Maturity
Flower color	Plant hight
Mature pod coloration	Stem diameter
Seed coat color	Number of pod per plant
Terminal leaf shape	Number of pods per peduncle
Leaf coloration	Number of peduncle per plant
Pod shape	Number of primary branches
Pod dehiscence	Number of secondary branches
Plant stand	Number of seed par pod
Nodulation	Pod length
	Seed weigth per plant
	Hundred seeds weigth
	Dry mater weigth
	Seed yield
	Forrage yield (Dolichos)
	Harvest index



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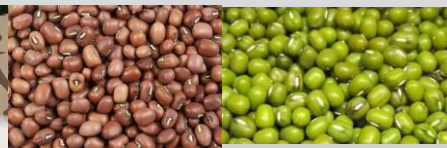
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## Tepary bean (*P. acutifolius*)

The research activities on tepary bean have conducted to the identification of high-performance genotypes that will be submitted for registration.



In addition with other genotypes introduced from CIAT (Columbia), some genotypes received from UC-DAVIS have been put on trial during rainy season 2023 .



# Tepary bean (*P. acutifolius*) Lines

N°	Lines	Origins
1	TARS-Tep 23	UC Davis
2	PI 440786	UC Davis
3	PI 310801	UC Davis
4	G40068	UC Davis
5	G40006A	UC Davis
6	G40119	UC Davis
7	G402200	UC Davis
8	G40173A	UC Davis
9	TARS-Tep 22	USDA-ARS PR
10	TARS-Tep 93	USDA-ARS PR
11	TARS-Tep 51	USDA-ARS PR
12	TARS-Tep 58A	USDA-ARS PR
13	TARS-Tep 97	USDA-ARS PR
14	TARS-Tep 100	USDA-ARS PR
15	TARS-Tep 101	USDA-ARS PR
16	TARS-Tep 112	USDA-ARS PR
17	TARS-Tep 32	UC Davis

N°	Lines	Origins
1	G40301	CIAT-Colombia
2	G40066	CIAT-Colombia
3	G40011	CIAT-Colombia
4	Local	Unknown



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# Scientific activities

These genotypes have been put on trial in five location: Kamboinsé, Saria, Po and Farakoba (BoBo Dioulasso) and Mani.



## Rainfall data in 2023

Locations	Kamboinsé	Mani	Saria	Farako-ba	Po <sup>4</sup>
Rainfall (mm)	1862	582.1	793.5	1100.4	922.99



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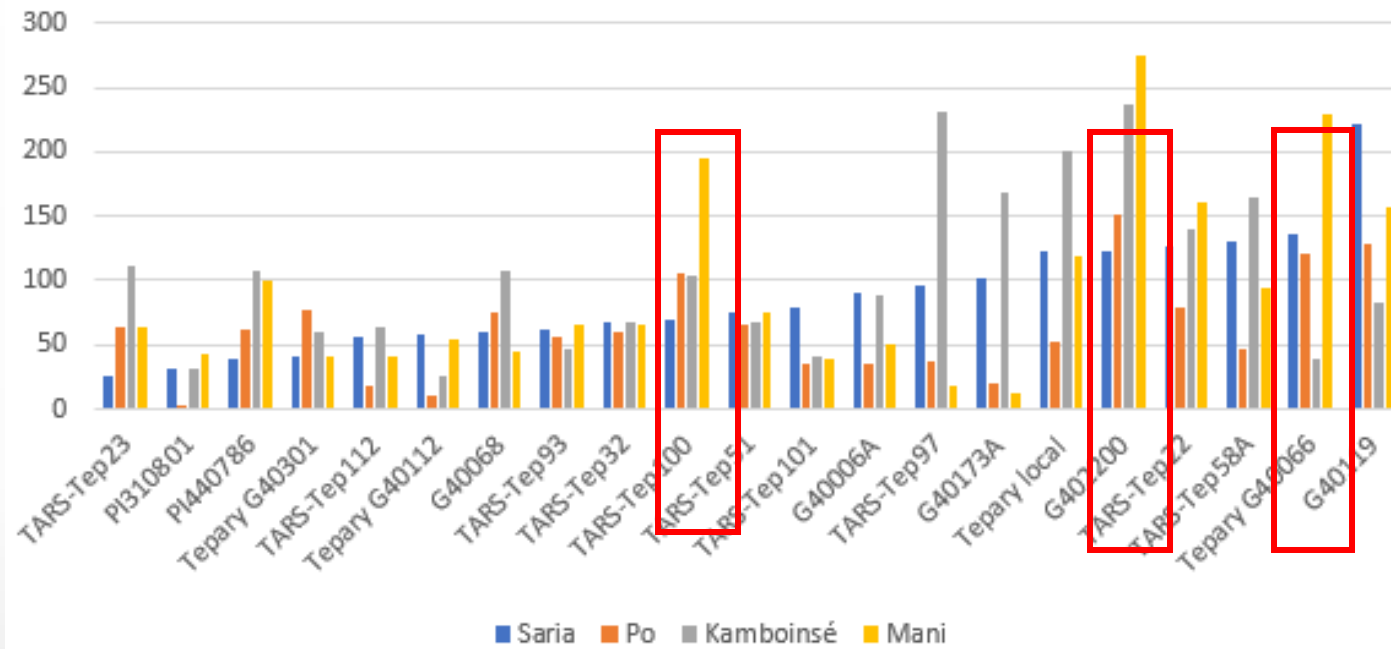
# Results



Table 4: tepary beans lines from UC-Davis yields from different locations

Lines	seeds weight (gm)				Total/Line (gm)
	Saria	Po	Kamboinsé	Mani	
TARS-Tep23	25.5	63.6	112.2	63	264.3
PI310801	30.6	1.2	32.3	43	107.1
PI440786	39.5	61.5	107.5	100	308.5
Tepary G40301	40.15	78	59.6	41.6	219.35
TARS-Tep112	56.2	17.2	63.1	40.15	176.65
Tepary G40112	57.53	11	26.1	54.7	149.33
G40068	59.73	75.95	107.4	44.5	287.58
TARS-Tep93	62.27	56.2	46.7	65.7	230.87
TARS-Tep32	66.77	60.9	67	65	259.67
TARS-Tep100	69.3	105.5	104.7	194.7	474.2
TARS-Tep51	75.95	66.1	67	75.7	284.75
TARS-Tep101	79.6	35.7	40	39.5	194.8
G40006A	89.67	34.9	88.1	49.6	262.27
TARS-Tep97	95.6	37.3	231.4	18.1	382.4
G40173A	101.8	19.8	168.5	12	302.1
<b>Tepary local</b>	<b>122.5</b>	<b>52.3</b>	<b>200.1</b>	<b>118.1</b>	<b>493</b>
<b>G402200</b>	<b>123.5</b>	<b>150.8</b>	<b>236.8</b>	<b>276</b>	<b>787.1</b>
<b>TARS-Tep22</b>	<b>126.9</b>	<b>79.4</b>	<b>140.3</b>	<b>161</b>	<b>507.6</b>
TARS-Tep58A	129.97	45.8	164.5	95.1	435.37
Tepary G40066	135.23	121.2	38.4	230.3	525.13
<b>G40119</b>	<b>221.2</b>	<b>127.9</b>	<b>83.3</b>	<b>156.3</b>	<b>588.7</b>
Minimum (gm)	25.5	1.2	26.1	12	
Maximum (gm)	221.2	150.8	236.8	276	
Means (gm)	86.16	62.01	104.05	92.57	
Total (gm)	1809.47	1302.25	2185	1944.05	

Yield per line (plot)/Location



Genotypes **TARSTEP100** ; **G402200** ; **TARSTEP 22** ; **TARSTEP93** ; **TARSTEP101** from this study in addition with **G40173A** and **G40119** are those that should be submitted for registration.



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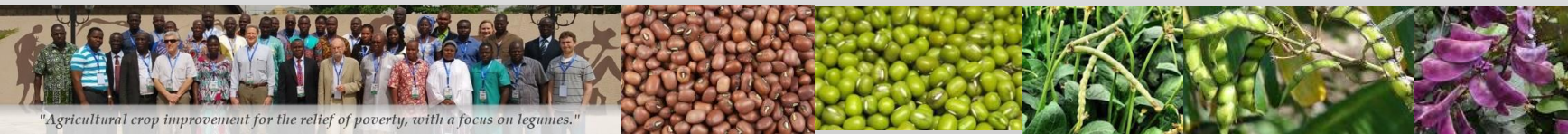


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Due to the loss we experienced during last rainy season and before conducting the DUS test, we are currently conducting multi-local trials in order to identify the best date of planting in each of the location we are planning to conduct the DUS test.

For this purpose, three date of planting have been choose regarding the time of rainy season beginning in each of the following location: **Kamboinsé, Saria, Po and Farakoba**

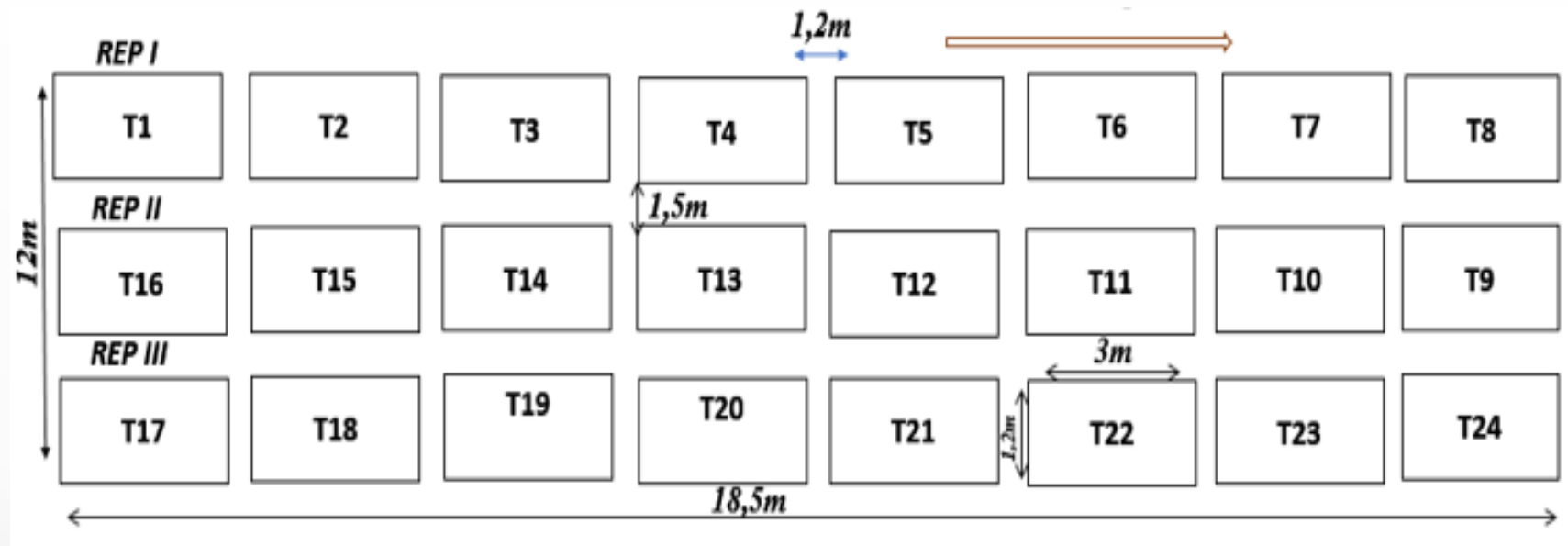


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# Experimentation

Experimentation design: RCBD with three replicate for each date of planting



Genotypes	Code
G40173A	T1 T13 T23
TARSTEP100	T2 T10 T19
G402200	T3 T11 T21
G40119	T4 T9 T17
TARSTEP93	T5 T16 T20
TARSTEP101	T6 T12 T18
TEPARY LOCAL	T7 T14 T24
TARSTEP 22	T8 T15 T22

Details	dimensions
Area	<b>18,5×12</b>
Number of rows per plot	3 <u>lignes</u>
Plot length	3m
Space between rows	60cm
Space between plants	30cm
Space between blocs	1,5m
Space between plots	1,2m
Number of replicates	3
Edge	2m

Data on yield and yield related traits will be recorded



# Expectations

Releasing of at least 3 mung bean varieties, 2 dolichos varieties this year

Releasing of 4 tepary bean promising varieties



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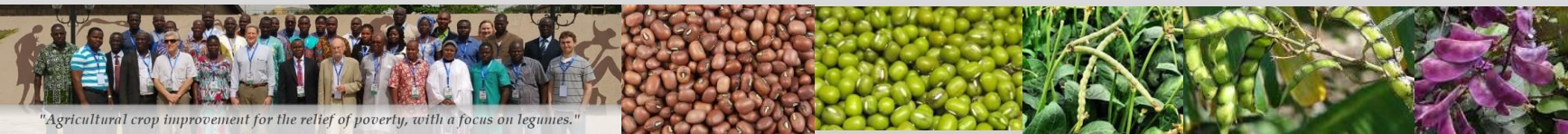
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Despite a late establishment of the rainy season, trials have been successfully established in most of the location (Kamboinsé, Saria, Donsin and Tita) for mung bean and dolichos DUS tests.

First and second date of planting tepary bean trial have also been planted in Kamboinsé and Saria.

Some Multiplication activities is undergoing for Moth bean and Bambara groundnuts



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THANKS FOR YOUR ATTENTION



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