

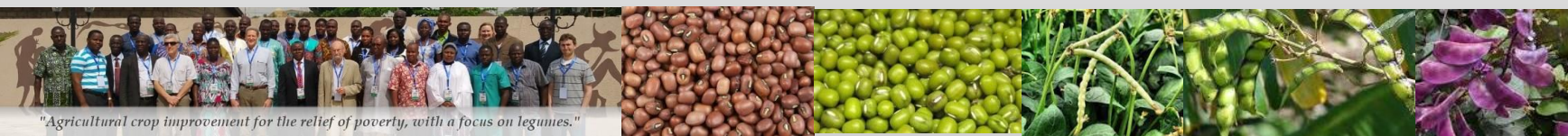


Project Title: Evaluation of Stress Tolerant Orphan Legumes for Dryland Farming Systems across Sub-Saharan Africa and India

Team: Dr Vandana Tyagi, PI & Dr Pratibha Brahmi, PI (upto 31.08.2023)
Dr Kuldeep Tripathi, CO-PI
Dr Bhaskar Bajar, CO-PI

Post-Entry Quarantine Growing, Characterization and Multiplication of Bambara Groundnut Germplasm

Dr Bhaskar Bajar
Scientist, ICAR-NBPGR Regional Station, Hyderabad, India
Date: 16.02.2024

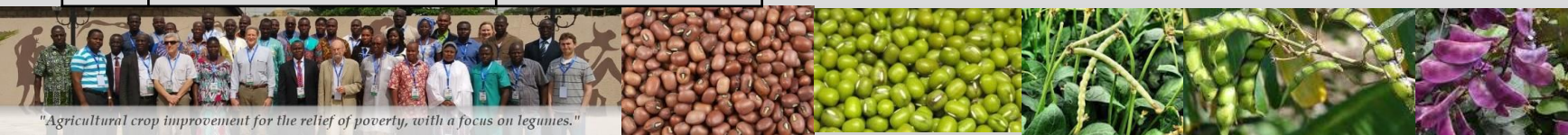


Germplasm Imported by ICAR-NBPGR under STOL project from African partner countries

S.No	Accession	EC No.
Burkina Faso - IP No 200/2023		
1	Manga	EC1181142
2	KVS 57	EC1181143
3	NALBAM-6	EC1181144
4	CMV12-18	EC1181145
5	Koandinga	EC1181146
6	cvdz-5	EC1181147
7	Soumbanga	EC1181148
8	KVS-190	EC1181149
9	cvdz-3	EC1181150
10	CMV04-18 (Dawanou Mali)	EC1181151
11	NALBAM-9	EC1181152
12	Soumpelga 1	EC1181153
13	Soum Kinkinga	EC1181154
14	Konkiene Pogto	EC1181155
15	cvdz-1	EC1181156
16	cvdz-7	EC1181157
17	CMV04-18 (Dawanou)	EC1181158
18	Soum Silmiga	EC1181159
19	CMV08-18	EC1181160
20	CVdz-2	EC1181161
Ghana – IP 230/2020		
21	SARI-19M-BG7	EC1050872
22	SARI-19M-BG2	EC1050873

23	SARI-19M-BG8	EC1050874
24	SARI-19M-BG19	EC1050875
25	SARI-19M-BG24	EC1050876
26	SARI-19M-BG18	EC1050877
27	SARI-19M-BG25	EC1050878
28	SARI-19M-BG13	EC1050879
29	SARI-19M-BG5	EC1050880
30	SARI-19M-BG4	EC1050881
Tanzania – IP 158/2020		
31	NALBAM-3	EC1050866
32	NALBAM-4	EC1050867
33	NALBAM-6	EC1050868
34	NALBAM-9	EC1050869
35	NALBAM-22	EC1050870
36	TANBAM	EC1050871
Niger – 453/2019		
37	cvdz-1	EC1056417
38	cvdz-2	EC1056418
39	cvdz-3	EC1056419
40	cvdz-4	EC1056420
41	cvdz-5	EC1056421
42	cvdz-6	EC1056422

43	cvdz-7	EC1056423
44	cvdz-9	EC1056424
45	cvdz-10	EC1056425
Uganda – IP No 236/2020		
46	Isuk Lu Korikor	EC1054949
47	Isuk Lu Puron	EC1054950
48	Isuk Lu Arengak	EC1054951
49	Isuk Lu Inyanga (Acen)	EC1054952
50	Isuk Lu Lol (Akwii)	EC1054953
51	Isuk Lu Inyanga (William)	EC1054954
52	Isul Lu Iriokok	EC1054955
53	Isuk Lu Kol (Moses)	EC1054956
Nigeria – 097/2022		
54	Torfam	EC1126229
55	Paavanger	EC1126230
56	Mumuye	EC1126231
57	Suan	EC1126232
58	Sokoto	EC1126233
59	Gberanger	EC1126234



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Post-Entry Quarantine growing of bambara groundnut germplasm during 2020 and 2021



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Post Entry Quarantine growing of 6 accessions from Nigeria during Kharif 2022 under net house conditions

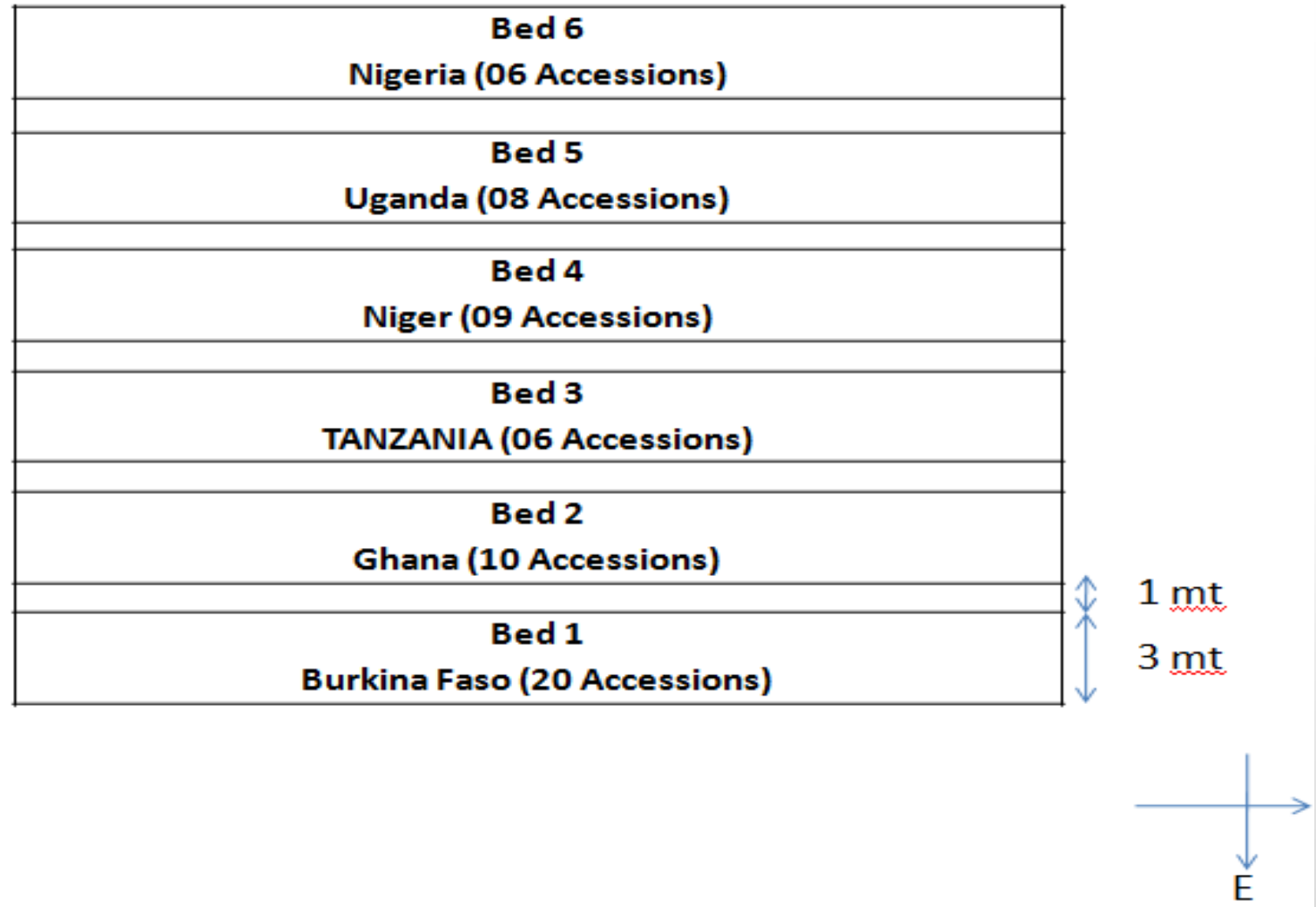


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Field Layout Kharif 2023

Season : **Kharif 2023**
Experimental Site : **ICAR-NBPGR, Hyderabad**
No of Accessions : **59 no.**
Spacing : **60 cm × 30 cm**



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Field view of the experiment



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Calendar of operations

S.No	Date	Operation
1	30-06-2023	Field preparation as per the layout of experiment
2	03-07-2023	Sowing
3	06-07-2023	Installation of poles and arrangement of 40 mesh insect proof net for each block
4	10-07-2023	Initiation of germination is observed
5	11-07-2023	First weeding (Manual)
6	12-07-2023	Data recording: Germination percentage data
7	21-07-2023	Draining of Standing water due to heavy rain for a week and ridges formation
8	24-07-2023	Multimicronutrient spray @ 2.5 ml/l
9	04-08-2023	Photographs of one month old crop taken
10	07-08-2023	Data recording on Days to 50% flowering
11	18-08-2023	Flood irrigation
12	21-08-2023	Second Weeding (Manual)
13	01-09-2023	Photographs of two months old crop taken
14	04-09-2023	Data recording on plant height
15	11 to 13-09-23	Data recording on chlorophyll data; terminal leaf shape, size and photos taken
16	25-09-2023	Harvesting initiated for few accessions in Burkina Faso consignment (Block-1)
17	03-10-2023	Harvesting initiated in Niger consignment (Block-04)
18	17-10-2023	Harvesting initiated in Ghana (Block 02) and Nigeria (Block-06) consignment
19	30-10-23 to 01-11-2023	Harvesting completed in Tanzania (Block 03) and Uganada (Block-05) consignment



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Weather data

	Average Temperature (°C)		Average R.H. (%)		Average Rainfall (mm)	Rainy days	Average Evaporation (mm)
	MAX.	MIN.	I	II			
June,2023	36.4	25.6	42.3	71.6	159.2	6	7.4
July,2023	29.0	23.3	71	88	378.4	14	4.0
August,2023	31.1	23.2	60.6	84.6	148.8	3	4.4
September,2023	30.0	22.5	68.0	90.0	270.8	14	3.7
October,2023	32.0	19.9	42.0	85.20	3.00	1	4.38
November,2023	30.2	19.8	49.73	86.50	0.35	0.03	3.38
December,2023	28.3	15.0	44.70	82.38	0.12	0	3.15

Data Source: Meteorological observatory, Agril Research Institute, PJTSAU, Rajendranagar, Hyd



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Field preparation activities



Germination %, Days to 50% Flowering, Pl height, no of pods, no of seeds per plant and 100 seed weight

S.No	Accession	EC No.	Germination (%)	Days to 50% flowering (days)	Plant Height (cm)*	No of Pods per plant *	
Burkina Faso		* Data represent the average of five plants					
1	Manga	EC1181142	80	35	24.33	11.75	
2	KVS 57	EC1181143	40	36	23.67	10.00	
3	NALBAM-6	EC1181144	10	40	33.00	71.00	
4	CMV12-18	EC1181145	50	35	25.23	31.75	
5	Koandinga	EC1181146	70	35	24.80	38.20	
6	Cvdz-5	EC1181147	70	35	26.00	28.40	
7	Soumbanga	EC1181148	100	35	25.34	44.60	
8	KVS-190	EC1181149	100	35	27.00	55.40	
9	Cvdz-3	EC1181150	70	35	25.13	20.60	
10	CMV04-18 (Dawanou Mali)	EC1181151	80	36	24.56	24.60	
11	NALBAM-9	EC1181152	80	42	24.18	33.60	
12	Soumpelga 1	EC1181153	70	35	21.07	26.80	
13	Soum Kinkinga	EC1181154	80	36	25.72	13.20	
14	Konkiene Pogto	EC1181155	80	35	27.00	22.40	
15	CVdz-1	EC1181156	60	35	22.78	26.20	
16	CVdz-7	EC1181157	80	35	25.52	15.25	
17	CMV04-18 (Dawanou)	EC1181158	70	36	25.98	46.20	
18	Soum Silmiga	EC1181159	80	35	22.46	51.50	
19	CMV08-18	EC1181160	90	41	27.40	23.20	
20	CVdz-2	EC1181161	70	35	22.46	24.20	



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Cont...

S.No	Accession	EC No.	Germination (%)	Days to 50% flowering (days)	Plant Height (cm)*	No of Pods per plant *
Ghana						
21	SARI-19M-BG7	EC1050872	100	42	26.90	32.40
22	SARI-19M-BG2	EC1050873	85	43	31.60	27.20
23	SARI-19M-BG8	EC1050874	90	45	30.90	18.20
24	SARI-19M-BG19	EC1050875	100	53	29.88	15.20
25	SARI-19M-BG24	EC1050876	100	43	30.18	16.00
26	SARI-19M-BG18	EC1050877	90	42	30.00	45.20
27	SARI-19M-BG25	EC1050878	100	45	26.20	16.00
28	SARI-19M-BG13	EC1050879	100	45	27.80	20.80
29	SARI-19M-BG5	EC1050880	85	45	30.18	20.00
30	SARI-19M-BG4	EC1050881	95	43	33.30	37.40
Tanzania						
31	NALBAM-3	EC1050866	80	41	38.00	25.20
32	NALBAM-4	EC1050867	65	43	37.10	48.00
33	NALBAM-6	EC1050868	100	40	36.10	53.20
34	NALBAM-9	EC1050869	85	41	31.50	36.00
35	NALBAM-22	EC1050870	75	43	32.00	20.80
36	TANBAM	EC1050871	45	42	32.60	66.80



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Cont.

S.No	Accession	EC No.	Germination (%)	Days to 50% flowering (days)	Plant Height (cm)*	No of Pods per plant*
Niger						
37	Cvdz-1	EC1056417	85	35	22.04	24.60
38	Cvdz-2	EC1056418	100	36	23.90	30.20
39	Cvdz-3	EC1056419	100	35	25.50	32.40
40	Cvdz-4	EC1056420	95	37	24.50	23.40
41	Cvdz-5	EC1056421	35	36	24.40	29.80
42	Cvdz-6	EC1056422	85	35	23.40	39.40
43	Cvdz-7	EC1056423	100	35	22.96	32.00
44	Cvdz-9	EC1056424	100	35	24.64	26.60
45	Cvdz-10	EC1056425	95	35	24.90	34.40
Uganda						
46	Isuk Lu Korikor	EC1054949	45	52	37.70	15.00
47	Isuk Lu Puron	EC1054950	5	50	34.25	23.00
48	Isuk Lu Arengak	EC1054951	80	45	34.20	21.80
49	Isuk Lu Inyanga (Acen)	EC1054952	75	44	32.00	21.20
50	Isuk Lu Lol (Akwii)	EC1054953	5	53	39.50	66.00
51	Isuk Lu Inyanga (William)	EC1054954	100	44	33.30	27.00
52	Isul Lu Iriokok	EC1054955	80	44	31.00	23.60
53	Isuk Lu Kol (Moses)	EC1054956	40	56	31.10	26.60



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Cont...

S.No	Accession	EC No.	Germination (%)	Days to 50% flowering (days)	Plant Height (cm)*	No of Pods per plant *
Nigeria						
54	Torfam	EC1126229	55	43	31.64	15.00
55	Paavanger	EC1126230	35	43	31.90	17.25
56	Mumuye	EC1126231	95	44	28.80	17.40
57	Suan	EC1126232	55	51	28.90	48.00
58	Sokoto	EC1126233	70	43	28.30	13.80
59	Gberanger	EC1126234	80	40	28.60	10.00



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S.No	Accession	EC No.	No of seeds per plant	100 seed weight (grams)	Seed color (RHS colour chart)
Burkina Faso * Data represents the average of five plants					
1	Manga	EC1181142	12.50	31.15	Grey Orange
2	KVS 57	EC1181143	8.33	42.19	Yellow- Orange
3	NALBAM-6	EC1181144	58.00	34.27	Red
4	CMV12-18	EC1181145	32.50	48.50	Yellow- Orange
5	Koandinga	EC1181146	21.50	53.18	Yellow- Orange
6	Cvdz-5	EC1181147	27.40	47.99	Greyed Yellow
7	Soumbanga	EC1181148	37.60	51.27	Cream
8	KVS-190	EC1181149	49.60	48.11	Cream
9	Cvdz-3	EC1181150	20.40	44.18	Black
10	CMV04-18 (Dawanou Mali)	EC1181151	22.00	29.58	Cream
11	NALBAM-9	EC1181152	32.40	46.69	Cream
12	Soumpelga 1	EC1181153	24.80	26.85	Yellow- Orange
13	Soum Kinkinga	EC1181154	14.40	29.50	Cream
14	Konkiene Pogto	EC1181155	22.60	38.97	Cream
15	CVdz-1	EC1181156	26.00	25.63	Cream
16	CVdz-7	EC1181157	19.00	41.00	Grey Orange
17	CMV04-18 (Dawanou)	EC1181158	45.20	30.97	Cream
18	Soum Silmiga	EC1181159	49.00	39.95	Yellow- Orange
19	CMV08-18	EC1181160	24.60	51.67	Grey Orange
20	CVdz-2	EC1181161	15.20	31.80	Grey Orange



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Cont...

S.No	Accession	EC No.	No of seeds per plant	100 seed weight (grams)	Seed color (RHS colour chart)
Ghana					
21	SARI-19M-BG7	EC1050872	32.80	41.95	Grey Orange
22	SARI-19M-BG2	EC1050873	28.00	50.20	Grey Orange
23	SARI-19M-BG8	EC1050874	18.80	65.60	Grey Red
24	SARI-19M-BG19	EC1050875	16.40	58.90	Orange
25	SARI-19M-BG24	EC1050876	43.75	61.21	Orange
26	SARI-19M-BG18	EC1050877	44.20	64.80	Grey Purple
27	SARI-19M-BG25	EC1050878	16.40	68.20	Orange Red
28	SARI-19M-BG13	EC1050879	21.80	66.35	Black
29	SARI-19M-BG5	EC1050880	20.60	81.66	Red
30	SARI-19M-BG4	EC1050881	38.20	55.11	Grey Orange
Tanzania					
31	NALBAM-3	EC1050866	26.40	51.93	Grey Yellow
32	NALBAM-4	EC1050867	46.00	45.07	Grey Yellow
33	NALBAM-6	EC1050868	52.80	48.53	Grey Red
34	NALBAM-9	EC1050869	33.40	45.87	Grey Yellow
35	NALBAM-22	EC1050870	20.80	44.37	Grey Orange
36	TANBAM	EC1050871	57.20	39.95	Grey Yellow



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Cont...

S.No	Accession	EC No.	No of seeds per plant	100 seed weight (grams)	Seed color (RHS colour chart)
Niger					
37	Cvdz-1	EC1056417	24.20	35.05	Grey Yellow
38	Cvdz-2	EC1056418	30.80	42.60	Grey Orange
39	Cvdz-3	EC1056419	29.80	46.20	Black
40	Cvdz-4	EC1056420	23.60	55.50	Grey Orange
41	Cvdz-5	EC1056421	29.80	38.10	Grey Orange
42	Cvdz-6	EC1056422	38.20	37.56	Grey Orange
43	Cvdz-7	EC1056423	31.80	44.03	Grey Orange
44	Cvdz-9	EC1056424	25.80	48.10	Grey Yellow
45	Cvdz-10	EC1056425	39.80	41.73	Cream
Uganda					
46	Isuk Lu Korikor	EC1054949	14.60	58	Grey Orange
47	Isuk Lu Puron	EC1054950	23.00	51.4	Grey Orange
48	Isuk Lu Arengak	EC1054951	20.80	44.2	Grey Orange
49	Isuk Lu Inyanga (Acen)	EC1054952	21.20	57.3	Grey Orange
50	Isuk Lu Lol (Akwii)	EC1054953	68.00	38.18	Grey Orange
51	Isuk Lu Inyanga (William)	EC1054954	23.80	48.1	Grey Orange
52	Isul Lu Iriokok	EC1054955	23.20	41.05	Grey Purple
53	Isuk Lu Kol (Moses)	EC1054956	25.60	55.2	Grey Yellow



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Cont...

S.No	Accession	EC No.	No of seeds per plant	100 seed weight (grams)	Seed color (RHS colour chart)
Nigeria					
54	Torfam	EC1126229	17.40	70.1	Grey Orange
55	Paavanger	EC1126230	15.50	68.6	Grey Purple
56	Mumuye	EC1126231	18.00	55.8	Grey Orange
57	Suan	EC1126232	40.00	57	Grey Orange
58	Sokoto	EC1126233	12.00	67.1	Grey Orange
59	Gberanger	EC1126234	9.60	56.8	Grey Orange



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Post Entry Quarantine growing of 6 accessions from Nigeria during Kharif 2022

	Pods /plant	Seeds/Plant
EC1126229 Torfan	5.02	5.24^a
EC1126230 Paavanges	5.17	3.76 ^{ab}
EC1126231 Mumuye	2.12	1.18 ^c
EC1126232 Suan	3.07	2.79 ^{bc}
EC1126233 Sokon	2.21	2.63 ^{bc}
EC1126234 Gberanger	2.54	1.69 ^{bc}
CD(0.05)		2.39
CV		55.61



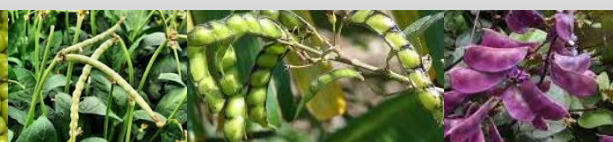
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Heavy incidence of Cercospora leaf spot incidence during Kharif 2022



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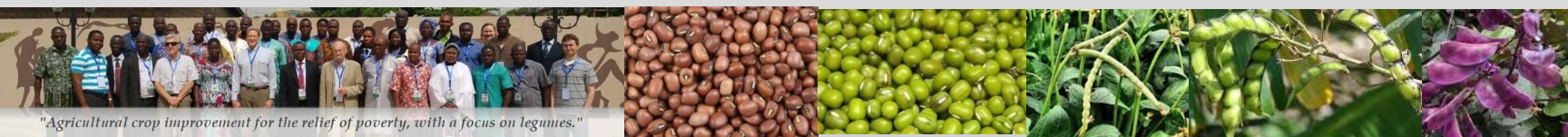
Kharif 2022

Weather data

Kharif 2023

	Average Temperature (°C)		Average R.H. (%)		Average Rainfall (cm)	Rainy days	Average Sunshine (Hrs)	Average Evaporation (mm)
	MAX.	MIN.	I	II				
1st fortnight of August	29.20	22.87	89.33	73.80	5.19	7.00	2.90	3.57
2nd fortnight of August	30.66	22.94	88.94	61.25	0.91	2.00	6.87	4.75
1st fortnight of September	30.17	22.93	91.07	71.73	10.71	7.00	4.54	3.76
2nd fortnight of September	29.77	22.07	88.80	67.87	4.49	5.00	5.05	3.90
1st fortnight of October	29.73	22.13	91.13	69.73	9.49	7.00	4.35	3.35
2nd fortnight of October	29.47	17.66	86.44	48.31	1.84	3.00	8.64	3.88
1st fortnight of November	29.50	16.97	85.33	45.33	0.00	0.00	7.33	3.48
2nd fortnight of November	29.23	14.90	81.13	38.87	0.00	0.00	6.96	3.08

	Average Temperature (°C)		Average R.H. (%)		Average Rainfall (cm)	Rainy days	Average Evaporation (mm)
	MAX.	MIN.	I	II			
June,2023	36.4	25.6	42.3	71.6	1.592	6	7.4
July,2023	29.0	23.3	71	88	3.784	14	4.0
August,2023	31.1	23.2	60.6	84.6	1.488	3	4.4
September,2023	30.0	22.5	68.0	90.0	2.708	14	3.7
October,2023	32.0	19.9	42.0	85.20	3.00	1	4.38
November,2023	30.2	19.8	49.73	86.50	0.35	0.03	3.38
December,2023	28.3	15.0	44.70	82.38	0.12	0	3.15



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Burkina Faso (20 Accessions)



@20 DAS



@30DAS



@60 DAS



@90DAS



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Ghana (10 Accessions)



@20 DAS



@30DAS



@60 DAS



@90DAS



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Tanzania (06 Accessions)



@20 DAS



@30DAS



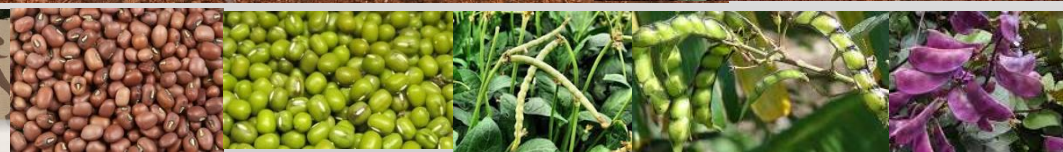
@60 DAS



@90DAS



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Niger (09 Accessions)



@20 DAS



@30DAS



@60 DAS



@90DAS



"Agricultural crop improvement for the relief of poverty, with a focus on legumes."



Uganda (08 Accessions)



@20 DAS



@30DAS



@60 DAS



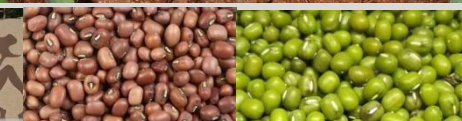
@90DAS



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Nigeria (06 Accessions)



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Flowering



KVS 57



SARI-19M-BG2



NALBAM-6



Cvdz-2



Isul Lu Iriokok



Sokoto



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Leaf variability

Burkina Faso



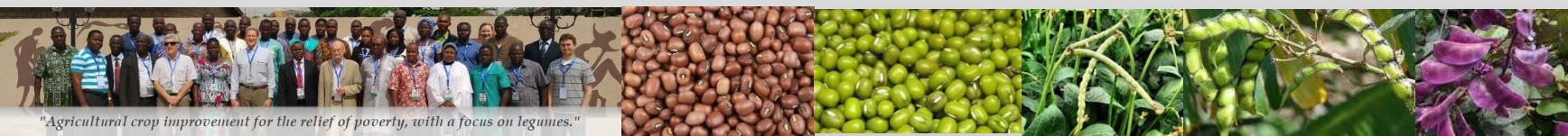
"Agricultural crop improvement for the relief of poverty, with a focus on legumes."



Ghana



Tanzania



"Agricultural crop improvement for the relief of poverty, with a focus on legumes."

Niger



Uganda



Nigeria



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Purple color stem, Purple Pods
NALBAM 6; NALBAM 22



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Green stem, Purple Pods - NALBAM 4



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Harvesting





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Pod Variability – Burkina Faso (20 Accn.)



Manga



KVS 57



NALBAM-6



CMV12-18



Koandinga



Cvdz-5



Soumbanga



KVS-190



Cvdz-3



**CMV04-18
(Dawanou Mali)**



Cont..



NALBAM-9



Soumpelga 1



Soum Kinkinga



Konkiene Pogto



CVdz-1



CVdz-7



**CMV04-18
(Dawanou)**



Soum Silmiga



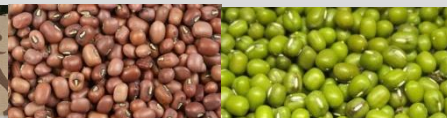
CMV08-18



CVdz-2



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Seed Diversity – Burkina Faso



Manga



KVS 57



KVS-190



Koandinga



CMV08-18



CMV04-18 (Dawanou Mali)



CMV04-18 (Dawanou)



CMV12-18



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Cont..



Soumpelga 1



Soum Silmiga



Konkiene Pogto



Soumbanga



Soumbanga - 1



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Seed Diversity – Ghana (10 Accn)



SARI-19M-BG7



SARI-19M-BG2



SARI-19M-BG8



SARI-19M-BG19



SARI-19M-BG24



SARI-19M-BG18



SARI-19M-BG25



SARI-19M-BG13



SARI-19M-BG05



SARI-19M-BG04



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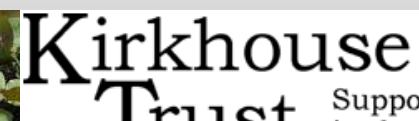
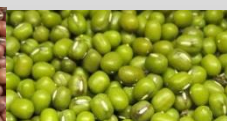
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Seed Diversity – Tanzania (6 Accn.)



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Seed Diversity – Niger (9 Accn.)



Cvdz-1



Cvdz-2



Cvdz-3



Cvdz-4



Cvdz-5



Cvdz-6



Cvdz-7



Cvdz-9



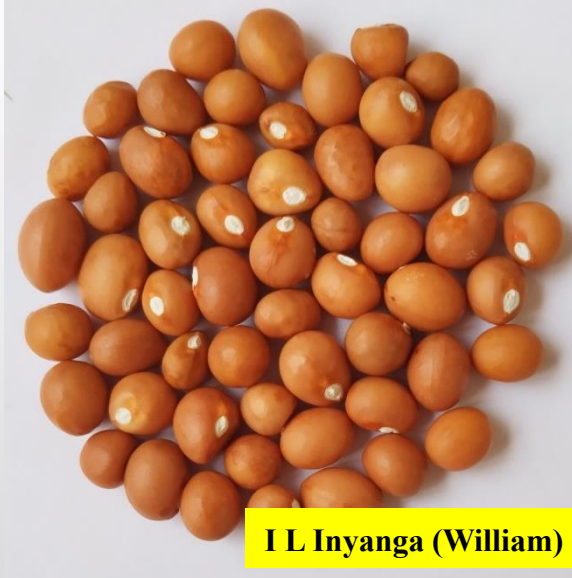
Cvdz-10



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Seed Diversity – Uganda (8 Accn.)



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Seed Diversity – Nigeria (6 Accn.)



Torfan



Paavanges



Mumuye



Suan



Sokon



Gberanger



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Dr Pratibha Brahmi (PI, STOL Project) Visit during Kharif 2022



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Dr Kuldeep Tripathi (Co-PI, STOL Project) Visit during Kharif 2023



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Interception of *Bean common mosaic virus* in bambara groundnut accessions imported from Ghana through RT-PCR

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‡ B Parameswari and Bhaskar Bajar equally contributed to this work.

Abstract

Bambara groundnut (*Vigna subterranea*) is an African legume with a great nutritional, economic and social potential. Thirty three bambara nut accessions imported from four African countries viz., Ghana, Niger, Tanzania and Uganda were grown in the glass house of ICAR-NBPGR Regional station, Hyderabad for post-entry quarantine growing during Rabi 2020-21. In December 2020, mosaic symptoms were observed on EC 1050874 out of ten accessions imported from Ghana. RNA was extracted from suspected samples and reverse transcribed with Potyvirus genus specific degenerate primers resulted in amplicons of ~600 bp. These amplicons were sequenced and NCBI Blast analysis showed 98.9% nucleotide sequence similarity to *Bean common mosaic virus* (BCMV) cylindrical inclusion protein (CI) sequences available in GenBank. Based on the results, BCMV specific primer was designed covering full length coat protein and partial -3' non-coding region and resulted in amplicons of ~900 bp. Further cloning and sequencing and blast analysis confirmed the association of BCMV with bambaranut imported from Ghana. Phylogenetic tree generated showed close association of BCMV-Ghana isolate with BCMV- (Purerto Rico) and BCMV-TZ:KRG2-7 (Tanzania) isolates. The results obtained from phylogenetic study were further supported by the different *in silico* analysis viz. evolutionary distance analysis, recombination and selection pressure analysis etc. However, till now there is no information available on occurrence of BCMV in bambara groundnut from Ghana. The entry of BCMV isolate from Ghana into India has been prevented.

Keywords: Bambara groundnut, Bean Common mosaic virus, Post-entry quarantine, Potyvirus, Recombination, Selection pressure.



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Characterization and Multiplication of Bambara Groundnut Germplasm during Summer, 2024

Characterization and multiplication of Bambara Groundnut Germplasm under STOL Project

Crop: Bambara Groundnut

Accessions: 52 No.

Season: Summer, 2024

Design: No design, but, 3 replications with randomization is being followed to collect mean data for different characters

Checks: no checks

Rows: 2 rows per each accession@3m row length

Spacing: 60 cm × 30 cm

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Replication 1
50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	
51	52		28	35	18	13	5	24	21	36	51	20	8	3	4	15	47	44	45	50	19	29	1	9	Replication 2
7	38	2	25	6	42	14	12	17	23	30	22	11	41	52	40	46	33	16	43	26	31	39	32	49	
27	34	10	37	48		32	35	44	52	28	24	37	50	33	7	46	12	43	38	6	14	26	22	42	
49	16	31	2	48	36	34	25	13	4	30	27	9	5	19	17	3	51	20	40	15	23	11	39	47	Replication 3
																	45	29	8	18	21	1	10	41	



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Characterization and Multiplication of Bambara Groundnut Germplasm during Summer, 2024

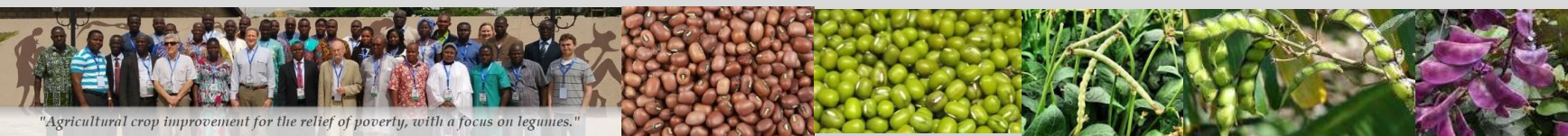


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Future line of work for mainstreaming and effective utilization of bambara groundnut accessions in India

1. Multilocation evaluation of BG accessions (~300) for agro-morphological and nutritional traits
2. Development of illustrative keys for facilitating characterization
3. Screening for Yellow Mosaic and root rot diseases resistance
4. Validation of superior accessions and sharing with potential partners
5. Try to establish linkage with AICRN-PC
6. NIR based prediction model for nutritional assessment



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- **Dr Vandana Tyagi, PI, STOL project, ICAR-NBPGR, New Delhi**
- **Dr N Sivaraj OIC, ICAR-NBPGR, RS Hyderabad**
- **Dr K Anitha, Former OIC, ICAR-NBPGR, RS Hyderabad**
- **Dr Kuldeep Tripathi, CO-PI, STOL project, ICAR-NBPGR, New Delhi**
- **Mr Akhil Jadhav, contractual staff, ICAR-NBPGR, RS Hyderabad**



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Thank You



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