Comparative investigation of farmer's criteria for cowpea varieties via farmers' participatory varietal selection in Niger and Burkina Faso

Haruki Ishikawa[1], Issa Drabo[2] , Christian Fatokun[1] , Ousmane Boukar[1] , Satoru Muranaka[3].

1. International Institute of Tropical Agriculture (IITA), 2. Institut de l'Environnement et de Recherches Agricoles (INERA)

3. Japan International Research Center for Agricultural Sciences (JIRCAS)

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Introduction

Cowpea (*Vigna unguiculata)* is an important crop for promoting the food security, livelihood, and cash income of farmers. Various improved cowpea varieties have been developed and released by the breeding programs in many national agricultural research systems in West Africa. However, the reports on farmers' selection criteria and farmers' acceptability of improved cowpea varieties are still limited. Further, these acceptability are sometimes complicated by the fact that the selection criteria employed by within the same country. Thus, in order to better understand the preferences and selection criteria employed by farmers, farmer participatory varietal selection (FPVS) activities were undertaken in Niger and Burkina Faso.

Methods

A total of 32 cowpea genotypes with different characteristics were planted and demonstrated in 12 villages in Niger and Burkina Faso in 2008-2011. A total of 1134 farmers (62%: men, 38%: women) participated in the FPVS and questionnaire survey.

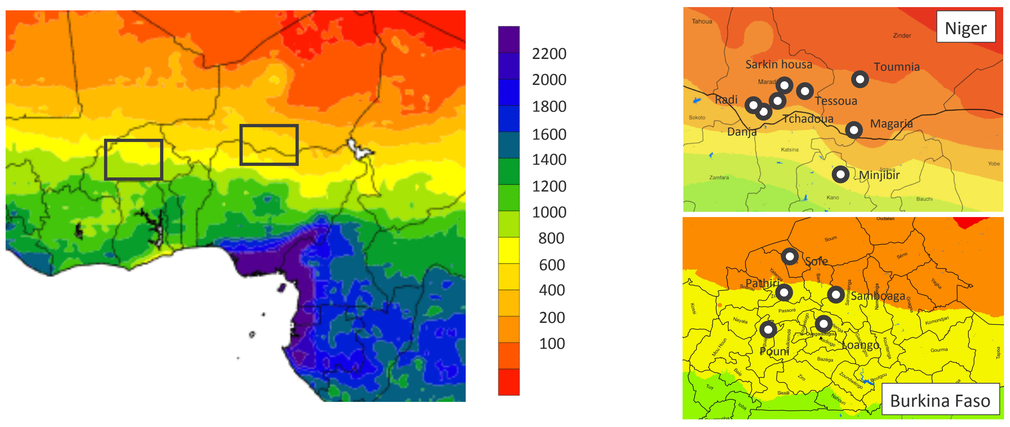

Figure 1. Target villages in Niger and Burkina Faso

Map image by NOAA, longitudinal color bar indicated annual rainfall (mm).

Results

Niger (2008-2009)		
Genotype	**%(2008)**	**%(2009)**
IT00K-1148	36.2	37.2
IT99K-573-2-1	27.2	28.3
IT90K-372-1-2	25.1	24.4
KVx30-309-6G	21.0	9.8
IT98K-205-8	19.6	26.5
TN256-87	15.7	14.8
IT99K-494-6	14.1	13.2
IT97K-499-35	13.6	12.2
IT00K-1263	13.4	11.4
IT98K-503-1	12.8	13.8
IT99K-377-1	12.7	8.2
IT88D-867-11	12.5	5.5
Aloka	12.5	14.1
IT99K-241-2	10.4	11.5
IT98K-409-4	8.2	9.4
IT99K-216-44	8.0	7.1
IT00K-1217	7.9	5.8
IT81D-994	6.4	8.4
Danila	5.5	12.4
IT89KD-374-57	5.4	10.1
IT98K-238-3	4.8	3.7
IT03K-338-1	3.6	7.0
B301	2.1	2.8
IT98K-1093-1	1.5	2.2

Burkina Faso (2010-2011)		
Genotype	**%(2010)**	**%(2011)**
KVx442-3-25	55.6	43.2
IT93K-452-1	31.5	9.9
IT98K-205-8	29.6	15.0
IT99K-573-2-1	26.6	40.2
KVx 775-33-2	25.3	44.9
IT90K-372-1-2	23.1	15.0
IT99K-494-6	15.1	3.1
Melakh	14.7	24.8
KVx396-4-5-2D	13.0	19.5
KVx771-10	11.9	29.6
IT00K-1148	10.3	2.3
IT00K-901-5	7.0	5.1
IT98K-503-1	6.9	12.2
KVx432-3J	6.7	4.9
IT98K-1093-1	4.3	5.1

Figure 2. Farmers selected varieties

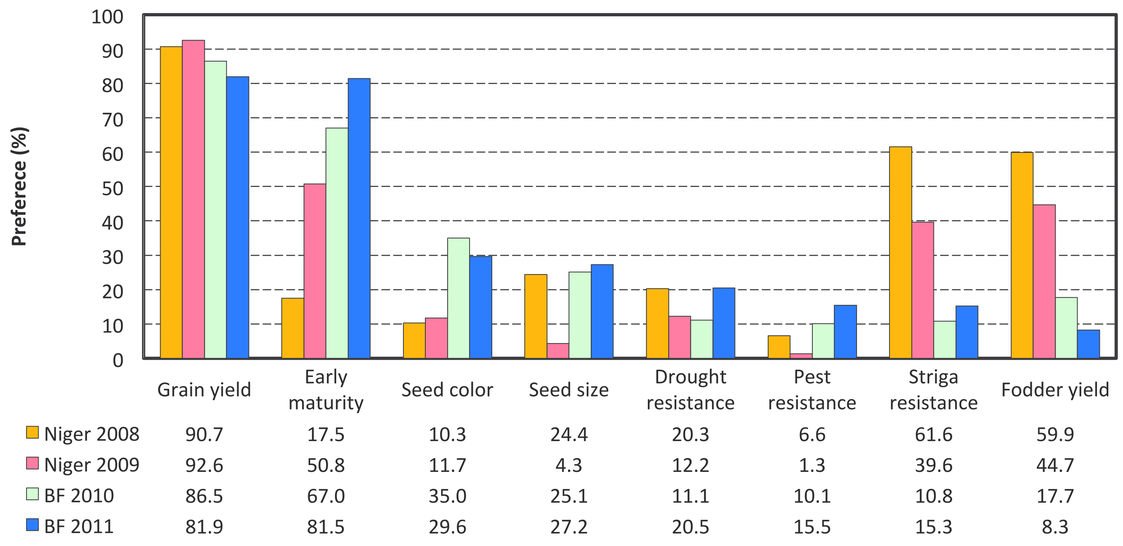

Figure 3. Farmers preferences in Niger and Burkina Faso

Table 1. Cowpea varietal characteristics for FPVS

E: early maturing, EE: extra-early maturing, M: medium, L: late, R: resistance, S: sensitive

Genotype	Day for Floering	Maturity class	Yield (kg/ha)	Striga resistance	Seed color	Seed texture	Seed size	Remarks
Aloka	45	E	795.0 *	S	Spekle	Rough	13.9	Niger
Danila	55	L	386.0 *	S	White	Rough	13.9	Niger
IT98K-238-3	44	E	761.2 *	S	Black	Smooth	17.6	Niger
IT81D-994	55	L	500.5 *	S	White	Rough	17.3	Niger
IT89KD-374-57	68	L	574.8 *	S	White	Routhg	18.0	Niger
IT99K-216-44	48	M	569.2 *	S	White	Rough	13.6	Niger
IT03K-338-1	57	L	110.8 *	R	Brown	Rough	17.1	Niger
IT99K-241-2	66	L	27.1 *	S	White	Rough	21.7	Niger
IT88D-867-11	45	M	653.8 *	S	Brown	Rough	15.7	Niger
TN256-87	50	L	507.9 *	S	White	Rough	13.4	Niger
KVx30-309-6G	47	M	876.4 *	S	White	Rough	18.8	Niger
IT99K-377-1	44	E	455.2 *	S	White	Smooth	13.7	Niger
B301	46	M	781.9 *	R	Brown	Smooth	7.0	Niger
IT98K-409-4	46	M	782.0 *	S	White	Rough	11.4	Niger
IT97K-499-35	44	E	592.5 *	R	White	Rough	12.1	Niger
IT00K-1217	40	E	578.9 *	R	White	Rough	12.4	Niger
IT00K-1263	45	E	571.8 *	S	Brown	Smooth	16.7	Niger
IT98K-503-1	43	E	437.7 **	R	White	Rough	13.3	Niger+Burkina Faso
IT98K-1093-1	46	M	642.8 **	R	Black	Smooth	10.8	Niger+Burkina Faso
IT00K-1148	44	E	929.3 **	S	Brown	Rough	14.1	Niger+Burkina Faso
IT98K-205-8	39	EE	854.3 **	R	White	Rough	13.0	Niger+Burkina Faso
IT99K-494-6	43	E	723.8 **	S	Brown	Rough	15.1	Niger+Burkina Faso
IT90K-372-1-2	45	E	904.9 **	S	White	Rough	16.5	Niger+Burkina Faso
IT99K-573-2-1	42	EE	907.6 **	R	White	Rough	18.8	Niger+Burkina Faso
IT93K-452-1	38	EE	921.9 **	-	White	Rough	18.0	Burkina Faso
IT00K-901-5	45	E	957.5 **	-	White	Rough	18.0	Burkina Faso
KVx396-4-5-2D	47	M	952.0 **	R	White	Rough	16.3	Burkina Faso
KVx421-2J	46	M	853.8 **	R	Brown	Rough	22.3	Burkina Faso
KVx442-3-25	46	M	1,006.6 **	R	White	Rough	19.0	Burkina Faso
KVx771-10	46	M	760.9 **	R	White	Rough	19.0	Burkina Faso
KVx 775-33-2	46	M	1,044,7 **	R	White	Rough	23.0	Burkina Faso
Melakh	32	EE	936.0 **	R	White	Rough	15.0	Burkina Faso

*Based on Niger farmers' field trial data 2008-2009

**Based on Burkina Faso farmers' field trial data 2010

Table 2. Farmers preferences in each target village

Niger							
Village	Radi	Danja	Toumnia	Magaria	Tessaoua	Sarkin Housa	Tchadoua
Year	2008	2008	2008	2008	2009	2009	2009
Maturity	12.0	16.7	20.6	20.7	60.0	60.0	32.4
Grain yield	80.0	94.4	95.2	93.1	96.7	84.0	97.1
Fodder yield	88.0	72.2	38.1	41.4	23.3	52.0	58.8
Striga resistance	64.0	61.1	52.4	69.0	20.0	40.0	58.8
Drought resistance	8.0	16.7	25.4	31.0	16.7	20.0	0.0
Pest resistance	0.0	5.6	17.5	3.4	0.0	4.0	0.0
Seed size	32.0	5.6	25.4	34.5	0.0	4.0	8.8
Seed color	12.0	22.2	0.0	6.9	13.3	16.0	5.9
Rainfall (mm/year)	475.5	477.5	431.4	362.5	-	-	-

Burkina Faso								
Village	Loango	Sofe	Samboaga	Pouni	Pathiri	Loango	Sofe	Samboaga	Pouni
Year	2010	2010	2010	2010	2010	2011	2011	2011	2011
Maturity	89.9	66.2	74	65.7	51.8	84.7	88.7	72.4	63.9
Grain yield	95.7	95.4	94	70.4	87.7	80.6	98.1	82.7	58.5
Striga resistance	13.0	1.5	2.0	22.2	7.9	20.4	0.0	22.8	9.8
Drought resistance	2.9	13.8	8	8.3	18.4	18.4	20.8	7.9	28.4
Pest resistance	2.9	20.0	2.0	18.5	4.4	2.0	0.0	35.4	13.1
Seed size	31.9	18.5	22	25	26.3	21.4	18.9	24.4	27.3
Seed color	44.9	3.2	18	52.8	36	32.7	22.6	42.5	10.9
Fodder yield	7.2	30.8	16.0	11.1	23.7	4.1	5.7	3.1	11.5
Rainfall (mm/year)	888.0	564.4	525.5	1033.3	836.5	594.5	443.5	529.0	628.0

Conclusions

-Basically, farmer prefers high yield variety. But, the variety which farmers actually use considers 2 or 3 acceptability, and is chosen.

-Differences of Niger and Burkina Faso were found in fodder yield, *Striga* R, seed color and maturity.

-These findings can provide better option to choice improved cowpea varieties which farmers really want for their region.

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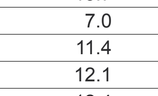
Contact:

Haruki Ishikawa



H.Ishikawa@cgiar.org

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