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CHARACTERISTICS OF RICE VARIETIES IN NORTHERN SIERRA LEONE

Report for CARE

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1. Rice Production in Sierra Leone

Rice is the staple food for Sierra Leoneans but production does not satisfy demand and the country is obliged to import rice especially to feed the Freetown population. Annual rice production is currently estimated to be around 900,000 metric tons of paddy.

The main problems identified with rice production by CARE are: 1) the poor quality of seeds leading to poor yields, 2) lack of post harvesting quality control, 3) lack of post harvest services such as rice mills, collection and, 4) lack of organized distribution.

The local varieties are well-known and have been used by farmers over a long period of time. Despite their reputation of low yielding capacities, they have their own advantages including their adaptability to local conditions. Improved varieties are available through the Seed Multiplication Project (SMP) and include the ROK and the new NERICA varieties disseminated by the Sierra Leone Agricultural Research Institute (SLARI). They have advantages (high yielding potential, short-cycle, palatability, high protein content) but present some constraints (short straws, harvest during rainy season, etc.) that are not well documented in the local context, making it difficult for the extension services to convey well-founded messages to the farmers, and to have a clear understanding of farmers' constraints when these new varieties are introduced in the farming system.

2. The CARE Value Chain Development Project

The European Union funded 22 month CARE Rice Value Chain Development (RCVD) Project, started on December 16, 2009 with the aim of improving food and nutrition security and increasing incomes through more efficient production and marketing practices supported through value chain promotion. In collaboration with the Sierra Leone Agricultural Research Institute (SLARI) and the private sector, the RCVD project is expected to address the main bottlenecks in the rice value chain in three northern district of Sierra Leone *(Bombali, Koinadugu and Tonkolili).*

The RVCD project will build on the progress made by the other projects in setting up Farmer Associations, in supporting their organizational development and helping them to improve their techniques, by taking them the next step to facilitating improvement in quality of product and adding value through to engaging in product value chain activities and marketing of their products.

3. Survey of varieties grown by farmers

A field survey was undertaken by Enterprise Development Services (EDS) Ltd in which 700 farmers in the three AVCD project cdistricts (Bombali, Koinadugu and Tonkolili) were asked to assess the rice varieties they were growing. Samples of farmers varieties were obtained and sent to the Rokupr Agricultural Research Centre (RARC) of the Sierra Leone Agricultural Research Institute (SLARI) for characterization. The rest of this report presents the description of the local varieties collected from farmers and improved varieties generally available in Sierra Leone

4. Descriptors and Descriptor-states of Improved Rice Varieties available in Sierra Leone

Variety	Descriptor and descriptor state									
	Awn*	PHT (cm)	Leaf ** Senescence	DTM (days)	Panicle length	Yield	Thresh-Ability+	1000 Grain wt.(g)	Grain Length	Grain Width
NERICA 1	0	62	5	113	23.2		5	30	9.6	3.1
NERICA 2	9	44	5	110	25.9		5	29	9.0	3.2
NERICA 3	1	43	5	113	24.5		5	29	9.6	2.8
NERICA 4	0	53	5	116	25.2		5	31	10.4	2.6
NERICA 5	0	66	1	112	23.3		5	27	8.8	2.8
NERICA 6	0	67	5	116	25.2		5	29	9.0	3.2
NERICA 7	0	66	5	109	23.2		5	35	10.8	3.2
ROK 3	0	92	9	145	24.6		9	27.5	10.7	3.0
ROK 16	9	91	9	123	24.2		1	28.8	8.3	3.0
ROK 17	0	83	5	114	20.8		5	25.4	8.8	2.8
Pa Kiamp	0	114	9	123	24.8		5	23.8	10.5	3.0

Awn*: (0) absent (1) short& p. awned (5) short& fully awned (7) long & p. awned (9) long & fully awned.
Leaf senescence:** (1) Late &slow (5) intermediate (9) early & fast.
Threshability+: (1) difficult (5) intermediate (9) easy.
NOTE:

- Rice varieties respond differently to the different agro-ecological production constraints/conditions
- Thus, there has never been and never will be a perfect variety- they all have failings in some characters
- The breeder's skill and judgment lies in the selection of that combination of characters which he considers most appropriate
- Hence, each variety will be a compromise and the compromise for any agro-ecology may be arrived at differently. The compromise invariably will change with changing with changing agricultural technology
- Implying a situation that is always dynamic- subject to modification with changing user requirements, changing disease spectra, changing climatic factors, changing input availability and costs etc.

5. **Characteristics of some RARC Released and Pre-released Improved Rice Varieties:**

Ecology	Variety Name	Plant Height (cm)	Days to Maturity	Grain Yield (tons/ha)		Soil Reaction		Disease & Pest Reaction	
				On-Station	On-Farm trials	Fe	Salt	Blast	RYMV
Upland									
	ROK 3	100-120	>130	2.8	2.0				
	ROK 16	100-120	<115	2.8	1.8				
	ROK 17	100-120	>130	2.8	1.8				
	ROK 18	<100	<115	3.0	2.0				
	ROK 20	<100	<115	3.0	1.8				
Inland valley Swamps									
Developed IVS	ROK 11	<100	120-155	4.3	3.8				
	ROK 14	<100	120-155	5.0	3.8				
	ROK 32	100-120	120-155	4.0	3.8				
No Iron Toxicity	ROK 25	<100	120-155	3.0	3.0				
	ROK 28	<100	120-155	3.5	2.9				
Iron Toxicity	ROK 23	>120	>155	3.3	2.0	T			
	ROK 24	>120	120-155	3.5	2.5	T			
Bolilands									
	ROK 10	100-120	120-155	3.5	2.5				
	ROK 29	>120	>155	3.5	2.8				
	ROK 30	>120	>155	3.5	2.5				
	CP 4	>120	>155	3.5	2.8				

6. Ecology, Genome or parentage and Sources of some Rokupr released rice varieties

Variety Name	Ecology	Parentage		Source
		Female (Seed)	Male (Pollen)	
ROK 1		(Tikiri Samba X	(Taichung 65 X Nachin 57)	Sierra Leone, (Rokupr)
ROK 2		Azucena Faya		Sierra Leone
ROK 3	Upland/Bolilands	Local Selection		Sierra Leone
ROK 5	Mangrove	SR 26 /	Pa Wellington	Sierra Leone
ROK 6	IVS	Peta X	Tangkai Rokan	IRRI
ROK 10	IVS/Mangrove/Bolilands	Foreign Introduction		IRRI via INGER
ROK 12		CICA /IR 665 /	Tetep	Columbia via IRRI
ROK 14	IVS			Taiwan
ROK 17	Upland	Local selection		Liberia via INGER
ROK 22	Mangrove	IR 4595 /	Pa Fant 2/3	Sierra Leone
ROK 24	IVS	Siam 25 /3	Malunja	Liberia via INGER
ROK 25	IVS	Taichung 65 /2	Mayang	Sri- Lanka via IRRI
CP4	Mangrove	Seriraja X	Gantang	Sierra Leone

7. Characteristics of some local varieties sampled from farmers fields, August/September 2010

Ecology	Sample No/Variety Name	Sterile lemma length (mm)	Spikelet Sterility	1000-grain weight (g)	Length (mm)	Width (mm)	Seed coat (Bran Colour)	Endosperm Type
Upland								
	1. Pa Yareki (Wareke)	3	CBD	20.9	5.6	2.2	5	3
	2.Pa France (R. soaked)	3	CBD	26.9	7.6	2.6	5	3
	3. Pa Serian	5	CBD	32.2	8.4	2.4	5	3
	4. Pa Site	1	CBD	11	3	2	3	3
	5. Pa Tarah	1	CBD	15.8	7.6	2.6	5	3
	11. Pa Lakay	1	CBD	13.9	5.8	2	5	3
	15. Pa Thereeh	3	CBD	29.2	7.6	2.8	5	3
	24. Pa 91	5	CBD	31	8.4	3.4	3	2
	25.3 Months (R. soaked)	3	CBD	24.8	6.6	2.6	5	3
	26. Pa Shak	**3**	CBD	**41.9**	**8.6**	**2.5**	**1**	**3**
	27. Pa Shak	**1**	CBD	**35.6**	**7.4**	**2.8**	**1**	**3**
	28. Pa Shak	1	CBD	35.8	8.8	3.4	5	3
	29. 3 Months (Pa Fent)	3	CBD	24.7	4.6	2.4	1	3
	39. Pa Maou Ronkoh	1	CBD	NA	5.4	2.4	5	1
	41. Pa Safari	1	CBD	20.6	7.4	2.4	5	3
	46. Pa Thereeh	3	CBD	29.8	4.6	2	5	3
	48. Pa Safari	3	CBD	20.6	4.6	2.4	5	3
	52. Paedepabai	1	CBD	19.5	7	3.2	3	1
	53. Pa Woto	5	CBD	26.1	7.6	3.4	5	3
	55. Pa Gbokano	5	CBD	31.1	7	3.8	3	3
	56. Bieyaka	5	CBD	30.3	8.4	3.4	1	3
	57. Pa Maria	1	CBD	14.4	5.6	2.2	5	3
	59. Gborokonde	3	CBD	NA	7.2	3.4	5	3

Ecology	Sample No/Variety Name	Sterile lemma length (mm)	Spikelet Sterility	1000-grain weight (g)	Length (mm)	Width (mm)	Seed coat (Bran Colour)	Endosperm Type
Upland/Inland valley Swamp								
	21. 3 Months	1	CBD	17.5	6.4	2.6	2	3
	23. Pa Gbonko	5	CBD	21.9	6.8	2.6	5	3
	42. Pa Bondo Motho	5	CBD	NA	6.4	2.4	5	3
	33. Pa Yenteh/ Pa Ronko	3	CBD	16.7	5.4	2.6	5	3
	31. Pa Amadu Ronkor	1	CBD	10.4	6.4	2.2	4	3
Inland valley swamps								
	8. Amgbass	3	CBD	19.1	7.8	2.6	1	3
	9. 3 Months (R. soaked)	5	CBD	24.7	7.6	2.6	1	3
	10. Ya Mabinti	3	CBD	23.9	7.8	2.2	1	3
	12. Pa Labo	3	CBD	24.3	7.4	3	1	3
	13. Pa Gbessay	5	CBD	22.5	6.6	3.4	5	3
	14. Pa Potho	1	CBD	24.3	7.8	2.6	1	3
	17. Pa Yakai	3	CBD	20.3	7	3.2	1	1
	19. Pa Bunch	3	CBD	24.3	7.2	3	5	3
	32. Pa Amadu Serry	1	CBD	21.2	8	2.6	5	3
	34. Torbobu	3	CBD	21.9	5.6	2.2	5	3
	35. Parloi	5	CBD	21.6	6.4	2.4	1	1
	36. Pa Captain	3	CBD	25.2	7.4	2.6	5	3
	37. Pa Kailahun	1	CBD	22.4	7.4	2.4	1	3
	38. Barthust Caristo	5	CBD	23.3	8.6	2.8	5	3
	43. Pa Rape	3	CBD	24.5	7.6	2.6	5	2
	44. Pa Thukule	5	CBD	21.7	7.4	2.6	1	1
	45. Pa Matches	3	CBD	21	7.4	2.8	1	3
	51. Korikori	3	CBD	18.1	4.4	2.2	1	3
	60. Pa Kurengba	1	CBD	21.6	7.6	3.6	1	2
	61. Pa Momoh Loko	3	CBD	20.2	7.6	3.4	5	3
Boli/IVS	30.Pa Kabba	3	CBD	25.6	7.4	2.6	1	3