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RESEARCH ARTICLE

STABILITY ANALYSIS IN NAGALAND SPECIAL RICE CULTIVARS

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ABSTRACT

Rice is the staple food crop of more than 60% of world's population. In terms of area and production it is second to Wheat. It is the foremost cereal crop of the world providing 22% of the world's calories and 17% of proteins. Globally the cultivation of Rice extends from 39ºS latitude to 45ºN latitude. Rice is grown worldwide in varying conditions of soil and climate. Rice is also the major crop of north-eastern parts of our country occupying 3.5 million hectare area. The north-eastern region accounts for 11% of national rice area and 6.5% of total national production. Nagaland is the hill state of north-east India. It is situated between 93º-95ºE longitude and 25º-27ºN latitude. The hills of the state of Nagaland are situated in the range from 194 to 3840 m above mean sea level and characterized by considerable topographical variation. Rice is the major crop of the state and is mainly grown in lowland and upland conditions. The total area under Rice is 146 thousand hectare with the production of 206 thousand tonnes. The tribal farmers of hilly region of Nagaland grow different cultivars of Nagaland Special Rice which are generally suited to lowland conditions. Twenty two cultivars of Nagaland special Rice have been evaluated at experimental farm of Indian Council of Agricultural Research (ICAR) Research Complex for NEH region, Jharnapani, Nagaland Centre and School of Agricultural Sciences & Rural Development, Nagaland University, Medziphema to assess the perfaormance in respect of all major traits to identify the most stable cultivars at both the locations. Kemelio was found to be the most stable variety in terms of yield, Kolchang and Alem special for stable flowering and Chakesang lha & Ranjit for maturity.

INTRODUCTION

Rice (*Oryza sativa*) belongs to family Graminae is the staple food crop of more than 60% of world's population. The total production of rice in the world amounts to 672,015,587 metric tonnes (anonymous, 2010). Although in terms of area and production it is second to wheat, yet it is the most important cereal crop consumed globally. Rice provides 21% of global human per capita energy and 15% of per capita protein. Although rice protein ranks high in nutritional quality among cereals, protein content is modest. Rice also provides minerals, vitamins and fiber, although all constituents except carbohydrates are reduced by milling. (anonymous, 2005). Among the rice growing countries, China has the largest area accounting for about 28% of the total area under rice. India ranks second with 120,620,000 metric tonnes in rice production next to China. As per the report of Directorate of Rice Development, Patna 2012; the total area under rice in India during 2010-11 is 428.625 lakh hectares with the total national production of 959.797 lakh tonnes (anonymous, 2012).

Rice is the major crop of north-eastern region occupying 3.5 million hectares that accounts for 10.48% of total rice area and 6.46% of total rice production in the country. Rice grown in the region can be primarily classified into six classes. These are 'Ahu' or 'Autumn rice', 'Sali' or Kharif rice also called winter rice, 'Bao' or deep water/floating rice. It can be further subdivided into upland and lowland rice.

Rice is the most important food grain crop of the State of Nagaland and grown throughout the state under upland conditions, direct seeded on hill slopes and irrigated lowland conditions. The total area under Rice cultivation in Nagaland is 1, 81, 400 hectares with the production of 318 thousand tonnes (anonymous 2012). The hill state of Nagaland is situated between 93° – 95° E longitude and 25°- 27° N latitude. It ranges from 194-3840 m above mean sea level and is characterized by considerable topographical variation.

Cultivars of Nagaland special which are suited to low land conditions of Nagaland have quantitative and qualitative traits desirable for agro-ecological conditions of the state of

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Nagaland. Within the state Nagaland special is best adopted and gives maximum returns at Medziphema and adjacent areas having altitude of 100-1400 ft above msl (Ngachan, 1993). The phenotypic performance of genotypes is contributed by genotype as well as environment. Differential response in respect of various traits has been observed by bringing about the change in sowing dates at an interval of 15 days. The present study was conducted to assess the stability is respect of all major traits among 22 cultivars. This will be helpful in identifying the most stable cultivar for utilizing in breeding programme.

MATERIALS AND METHODS

The experiment was conducted at the experimental field of Department of Genetics & Plant Breeding, School of Agricultural Sciences, Nagaland University Campus Medziphema and ICAR, Jharnapani centre which lies between 25^0 45' 43" N and 93^0 53' 4" E longitude at an elevation of 310 m above mean sea level. The average rainfall varies between 2000 mm to 2500 mm and temperature ranges between 11^0C to 33^0C with the subtropical climate coupled with high relative humidity.

A total of 21 cultivars of rice popularly known as Nagaland Special Rice have been procured from different places of Nagaland. All of them have specific common names in the areas of their cultivation. The cultivars procured from Khaibung area have been named as V1 to V8 and are traditionally names as Alem special, Kolchang, Changbem, Changvom, Singson Chang and Changsen; similarly ten cultivars locally known as Kohima special, Kemelio, Jalukie KI, Khurson, Chakhesang lha, Kemelo-u, Kemese-u, Kemesou, Kekhrielha and Changpem were collected from Sochunuma area. The cultivars viz. Kemese, Sirhilha and Kemelo were procured from Medziphema area and one Ranjit from Jharnapani area of the State of Nagaland.

Initially all the cultivars along with variety Ranjit were grown in nursery in three different dates at an interval of 15 days starting from first week of June to early second week of July then seedlings of 25 days of age have been transplanted to the main field. All the cultivars have been grown in Randomized Block Design under lowland conditions of experimental farm of the both the locations with three replications. In the main field the individual plot size was 1.0m X1.5m and spacing of 20X15 cm was maintained. Time to time observations on various characters such as days to 50% flowering, plant height, effective tillers, leaves per tiller, days to 80% maturity, panicle weight, branches per panicle, panicle length, 100 seed weight, Grain length/breadth ratio and yield per plant have been recorded. The analysis of stability parameters has been done according to Eberhart and Russel (1966).

RESULTS AND DISCUSSION

Analysis of Variance

The results of the analysis of variance worked out for stability are presented as below:

Days to 50 per cent flowering: Significant differences were observed among the varieties (70.47), environments (323.62) and environment (linear) (647.24) for this trait. It was observed that V1 took minimum days (89.66) and V8 took maximum days (109.55) for attaining 50 percent flowering.

Plant height: Environment (3107.43) and environment linear (6214.86) exhibited significant differences for plant height. V4 reported maximum height (171.84 cm) whereas V16 minimum with 124.09 cm plant height.

Effective tillers: Significant difference was observed only in varieties (2.68) V22 produced the highest numbers of effective tillers (10.33) and V1 least tillers (6.77).

Leaves per tiller: Among varieties, environment + (V X E), environment, variety X environment, environment (linear) and v X e (linear); the differences were significant for this trait. V8 had the highest number of leaves (5.66) and V11 had the least (4.33).

Days to maturity: Significant differences were observed among replications within environment, varieties, env + (var X env), var X env. The varieties V11 and V4 took maximum (114) and V4 minimum (264.66) days to mature, respectively.

Panicle length: Varieties (2.45), env + (var X env), environment (32.65) and env (linear) (65.31) differed significantly. The highest length of panicle (27.96 cm) was revealed by V11 and least (24.23 cm) by V3.

Panicle weight: Differences were significant for panicle weight for variety X environment and v X e (linear). Maximum weight (20.03 g) and minimum weight (12.11 g) were exhibited by V7 and V22, respectively.

Table 1 Analysis of Variance for Stability parameters in Rice

Sources of variation	d.f.	Days to 50 per cent flowering	Plant height (cm)	Effective tillers	Leaves per tiller	Days to maturity	Panicle length (cm)	Panicle weight (g)	Branches per panicle	100 seed weight (g)	Grain L/B ratio	Yield per plant (g)
Replications within environment	6	0.01	42.99	3.03*	0.33**	2422.26**	3.81*	2.79	0.31	0.01	0.01	12.65
Varieties	21	70.47**	524.17	2.68*	0.21**	2704.47**	2.45*	9.49	1.39	0.41**	0.17	2650.45**
Env+(Var X Env)	44	38.23	447.63	0.81**	1.81**	2474.17**	2.94**	4.89	0.63	0.04	0.08	147.05**
Environments	2	323.62**	3107.43**	1.31	35.64**	2811.10*	32.65**	16.40	0.60	0.16	0.03	1147.62*
Var X Environ	42	24.64	320.97	0.79	0.20**	2458.12**	1.52	4.34*	0.63	0.03	0.08	127.69*
Env (Linear)	1	647.24*	6214.86**	2.63	71.28**	5622.20**	65.30**	32.81	1.21	0.23	0.06	2295.25*
VarX Env (L)	21	24.89	321.10	0.41	0.36**	4291.22**	1.90	3.83*	0.44	0.02*	0.04	203.34**
Pooled deviation	22	23.27**	306.26**	1.11*	0.04**	596.61	1.09	4.63	0.79	0.05	0.12	49.68**
Pooled Error	132	0.01	60.92	0.63	0.14	2424.38	0.83	2.57	0.47	0.08**	0.01**	13.47

* Significant at 5% level; ** Significant at 1% level

Branches per panicle: The differences were non-significant for this trait. V10 and V 18 (12.67) and V22 (10.00) produced maximum and minimum of branches per panicle.

100 seed weight: The differences were significant in among varieties and v X e (linear). V14 exhibited maximum (3.38 g) and V22 minimum (1.80 g) of test weight.

Grain L/B ratio: The differences were non-significant for this trait with 3.50 as the highest value exhibited by V8 and V9 revealed minimum grain L/B ratio (2.56).

Yield per plant: Yield per plant differed significantly for among varieties, env + (var X env), environments, var X env (linear) and var X env. The maximum yield per plant was produced in V6 with 217.89 g followed by V15 (209.43 g) and that of minimum by V19 (121.13 g) followed by V21 (120.57 g).

Values of stability parameters

The variety V8 had the maximum value of phenotypic index and V22 exhibited maximum (2.88) regression value for days to 50 per cent flowering. For deviation from linearity the minimum value was observed in V10 and maximum in V20 (133.376). In case of plant height V4 had the highest phenotypic index. The variety V6 recorded highest regression coefficient (0.80) but it has least deviation from linearity (25.85) which was very high in V7 (1931.42).

The variety V22 revealed highest (1.7) phenotypic index and V1 recorded least (-81.8) for effective tillers. For this trait the variety V15 exhibited highest deviation (7.83). The value of phenotypic index was recorded highest (0.7) in V8 for leaves per tiller. The regression value of 1.51 was recorded in V10 for leaves per tiller making it least phenotypically stable for this trait. The preferred value for phenotypic index was observed in V10 and V11 for days to maturity. For regression value for this trait the varieties V20 (0.81) and V15 (0.76) were found most suitable.

As far as panicle length is concerned V11 have the highest phenotypic index (1.70) while V3 has the least (-2.00). The Variety V19 exhibited maximum deviation from linearity with the value of 4.12. For the trait panicle weight maximum positive phenotypic stability was recorded by V7 (3.90) and V22 with minimum (-3.9). The least and highest deviation from linearity for panicle weight was revealed by V1 (0.17) and V9 (19.68), respectively.

The varieties V10 and V18 had the highest phenotypic index (0.90) and V22 had the least one (-1.70) for branches per panicle. The highest value of phenotypic stability for 100 seed weight was observed in V14 (0.60) and least in V22 (-0.90). V8 variety exhibited a poor regression value of 2.66 for test weight. The desirable regression value was found in V5 (0.96) and V8 exhibited a poor regression (2.66). For the trait Grain L/B ratio V11 was poor performer for regression value. The variety V7 revealed maximum deviation from linearity (1.74) for this trait. For the trait yield per plant phenotypic index was highest and maximum in V6 (52.3). The variety V6 was favourable for regression value (0.91) and V7 had a poor value (4.57). V10 also least deviated from linearity (0.85) while V7 revealed maximum deviation (289.47) for yield per plant.

From results of stability analysis it is clear that for yield significant differences were observed among varieties, environment + (V X E), environments and V X E. Significant G X E interaction variance is suggestive of differential performance of varieties under different environments. De *et al.* (1992) observed G X E interaction. Both linear and non-linear component of G x E interaction were found significant by Singh and Payasi (1999). As per the findings of Belhekar *et al.* (2004), Senapati and Sarkar (2004) and Tomar *et al.* 2004; significant contribution of environments, G X E and env + (G X E) was reported.

Yield is an important aspect of any research programme and all breeding programme aims to improve the yield. But high yielding varieties cannot always be considered as the best varieties. The variety with high yield potential coupled with wide stability is considered at the most desirable one because of its stable performance over varied agro-climatic conditions. Taking into account the three parameters of stability variety Kemelio (V10) can be regarded as the most stable variety with respect to yield. It was the only variety with least deviation. Its phenotypic index was more than zero and regression value almost equal to one. It was observed that for effective tillers Changbem (V5) and Kemesou (V19) exhibited same values of regression and deviation from linearity.

For effective tillers Changbem (V5) and Kemesou (V19) exhibited the same value of regression and deviation from linearity. Considering stability parameters, these two varieties were found to be the best performers. Khurson (V13) was the worst performer. Changsen (V8) was the most stable variety for leaves per tiller. Kemese (V12) and Kemese-u (V18) are the varieties that can be considered least stable for leaves per tiller. For the character days to maturity 19 varieties exhibited phenotypic index less than zero. Kolchang (V4) was observed to be the least stable and Kemelio as the most stable one. Changvom (V6) is found to be the stable variety for panicle length and Kemelio (V10) as the least stable. The variety Jalukie K. I. Was observed to be the most stable for panicle weight and SIngson Chang (V7) was the unstable variety for this trait.

Two varieties Kohima special (V9) and Kemelio-u (V18) had same and highest phenotypic index for branches per panicle. Kolchang (V4) can be considered as the best variety for branches per panicle and Kemese (V12) was the poor performer.

The results regarding stability parameters are in agreement with those of Prasad *et al.* (2001), Subbi *et al.* (2002), Bose *et al.* (2004), Dushyantha and Shadakshari (2006).

From results it can be concluded that Kemelio being the stable variety be studied critically and other promising varieties in terms of stable flowering were Kolchang, Alem Special and for maturity Ranjit and Chakesang lha may also be further explored and analyzed critically for their stable performance.

Table 2 General mean over environments

Genotypes	Days to 50 per cent flowering	Plant height (cm)	Effective tillers	Leaves per tiller	Days to maturity	Panicle length (cm)	Panicle weight (g)	Branches per panicle	100 seed weight (g)	Grain L/B ratio	Yield per plant (g)
V1	89.66L	141.04	6.77L	5.22	125.66	24.59	15.25	12.22	2.66	3.31	144.81
V2	92.22	160.53	7.55	4.66	124.33	26.4	16.95	11.88	3.22	3.09	132.23
V3	102.33	146.13	7.22	4.66	127.33	24.33L	15.78	11.77	2.90	2.73	161.91
V4	96.66	171.84H	8.22	4.66	264.66H	26.59	16.70	12.00	3.02	2.89	202.85H
V5	101.00	156.65	8.77	5.00	126	25.69	16.68	11.66	2.57	2.96	162.2
V6	103.44	163.06	9.00	4.77	128.44	26.63	16.59	11.44	3.23	2.58	217.89H
V7	106.44	162.44	9.22	4.88	135.33	27	20.03H	11.88	2.95	2.93	182.58
V8	109.55H	127.54	9.88	5.66H	135.33	25.51	14.01	11.00	2.31	3.5H	191.44
V9	98.66	142.73	7.44	4.77	125.66	26.66	18.06	11.66	2.76	2.56	128.49
V10	102.77	141.00	8.77	4.77	136.22	27.60	14.26	12.66H	2.72	2.7	174.4
V11	97.88	161.8	7.77	4.33L	114L	27.96H	16.37	10.11	2.47	2.97	157.06
V12	100.44	152.77	9.11	4.88	120.66	25.97	16.14	12.11	2.43	2.88	173.78
V13	92.55	146.93	8.11	4.88	120.66	26.64	12.87	11.44	2.9	2.79	161.37
V14	97.33	154.38	8.11	5.11	127.33	27.04	15.66	12.55	3.38H	2.87	169.22
V15	96.66	163.49	8.66	4.88	127.66	22.68	14.77	11.55	2.99	2.75	209.43H
V16	103.33	124.09	8.33	5.11	129.33	25.99	15.94	11.33	2.85	2.64	195.83
V17	104.33	146.5	9.88	5.00	124.33	25.34	17.02	11.77	2.81	2.88	195.29
V18	104.00	163.67	8.6	4.88	126	26.58	17.17	12.66H	2.48	3.15	117.49L
V19	99.33	150.66	8.4	5.22	132.33	26.6	15.97	12.00	2.27	2.91	121.13L
V20	96.33	130.37	0.11	4.77	119	25.67	18.41	12.11	2.95	2.68	150.73
V21	103.00	137.71	0.11	5.00	129	26.34	16.58	12.00	3.11	2.65	120.57
V22	100.00	134.8	10.33	5.11	124	25.28	12.1L	10.00	1.8L	3.26	170.45

Table 3 Estimates of phenotypic index, phenotypic stability (regression value) and deviation from linearity

Genotypes	Days to 50 per cent flowering			Plant height (cm)			Effective tillers			Leaves per tiller			Days to maturity		
	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di
V1	-10.2	0.25	0.73**	-0.8	-0.74	-58.17	-81.8L	2.24	0.72	0.2	0.30	-0.15	-7.0	-0.01	-2421.70
V2	-7.6	-0.62L	18.78**	11.4	-0.14	-22.29	-1.0	-1.06	0.08	-0.2	0.45	-0.15	-8.3	0.18	-2400.73
V3	2.4	0.64	0.26**	-2.9	0.07	69.96	-1.3	2.80	-0.72	-0.2	0.68	-0.10	-5.3	0.05	-2412.29
V4	-4.2	0.39	0.09	22.7	1.20	-56.57	0.3	0.61	-0.71	-0.2	0.90	-0.15	131.9	19.28	9706.69*
V5	1.1	0.65	1.20**	7.5	0.45	213.32*	0.16	0.89	0.56	0.0	1.36	-0.15	-6.7	0.14	-2415.83
V6	3.5	1.07	3.87	13.9	0.80	25.85	0.3	2.52	0.49	-0.3	0.83	-0.09	-4.2	0.02	-2386.55
V7	6.5	0.97	6.45**	13.3	0.38	1931.42**	0.6	-0.39	-0.24	0.0	0.21	-0.15	2.6	0.30	-2410.12
V8	9.6	1.89	5.09**	-21.5	1.18	920.48**	1.2	1.12	-0.37	0.7	0.45	0.06L	2.6	0.09	-2319.74
V9	-1.2	1.72	24.89**	-6.3	2.00	52.36	-1.1	1.74	-0.14	-0.1	1.28	-0.10	-17.0	0.50	-2377.55
V10	2.8	0.26	0.03	-8.0	0.15	578.65**	0.16	1.57	-0.52	-0.1	1.51	0.08	-18.7	0.64	-2313.04
V11	-2.0	0.85	20.32**	12.7	-0.22	-30.82	-0.8	0.22	-0.45	-0.5	1.13	-0.09	-18.7	0.64	-2313.04
V12	0.5	0.15	9.13**	3.6	0.68	-55.61	0.4	-1.62	4.34**	0.0	1.21	-0.15	-12.0	-0.16	-2418.32
V13	-7.3	0.92	20.50**	-2.1	0.67	210.71**	-0.5	-1.12	-0.37	0.0	1.21	-0.15	-6.0	-0.15	-2386.05
V14	-2.5	2.28	88.57**	5.2	1.87	-58.70	-0.5	5.10	-0.24	0.1	1.28	-0.09	-5.3	-0.25	-2198.52
V15	-3.2	1.49	98.68**	14.3	1.78	666.76**	0.0	-0.84	7.83**	0.0	0.98	-0.10	-5.0	0.76	-2409.55
V16	3.4	0.75	17.84**	-25.0	0.51	-52.99	-0.2	-2.18	-0.65	0.1	1.05	-0.15	-3.3	-0.15	-2395.35
V17	4.4	0.89	9.14**	-2.6	2.70	-36.31	1.2	1.79	0.27	0.0	0.90	-0.15	-8.3	-0.06	-2392.62
V18	1.4	1.02	6.96**	14.5	2.17	520.73**	0.0	1.68	-0.19	-0.01	1.43	-0.09	-6.7	-0.02	-2386.42
V19	-0.5	0.09	28.37**	1.5	1.14	164.78	-0.1	0.89	0.56	0.2	1.21	-0.15	-0.3	-0.29	-2418.17
V20	-3.5	1.50	133.76**	-18.7	3.23	43.66	0.4	0.72	-0.73	-0.1	0.83	-0.10	-13.7	0.81	-2370.97
V21	3.1	-0.15	13.28**	-11.3	-0.30	430.66*	1.4H	4.77	-0.73	0.0	1.13	-0.10	-3.7	-0.23	-2423.94
V22	0.1	2.88H	3.67	-14.3	2.35	-55.24	1.7H	0.50	-0.55	0.1	0.60	-0.15	-8.7	0.47	-2234.04

Table 4

Genotypes	Panicle length (cm)			Panicle weight (g)			Branches per panicle			100 seed weight			Grain L/B ratio			Yield per plant		
	g (pi)	bi	σ^2di	g (pi)	Bi	σ^2di	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di	g (pi)	bi	σ^2di
V1	-1.6	-0.28	-0.92	-0.7	0.81	0.17	0.4	-4.51	-0.40	-0.1	0.79	0.04*	-162.1	1.83	0.01	-20.6	0.76	-13.13
V2	0.1	0.0	-0.91	0.9	1.61	3.46	0.1	-1.12	-0.46	0.4	-0.24	-0.08	-162.4	-10.19	0.08**	-33.2	0.42	-13.09
V3	-2.0	-0.08	-0.50	-0.2	0.85	-2.55	0.0	0.21	0.49	0.1	-0.02	0.09**	-162.7	-7.03	0.02	-3.6	-0.08	-12.99
V4	0.3	1.19	0.61	0.6	0.44	-2.43	0.2	1.92	-0.44	0.2	1.42	-0.0	-162.6	-0.65	-0.01	37.3	0.45	43.67*
V5	-0.5	0.97	-0.95	0.8	-0.67	-2.58	-0.0	1.92	2.01	-0.2	0.96	-0.0	-162.5	-12.36	0.01	-3.3	-0.05	-12.84
V6	0.3	0.57	0.08	0.5	-0.80	-1.59	-0.2	-2.13	-0.44	0.4	1.45	-0.0	-162.9	-0.39	0.16**	52.3	0.91	118.74**
V7	0.8	-0.58	-0.77	3.9	2.46	1.40	0.1	6.09	0.37	0.1	2.30	0.07	-162.5	-23.69	1.74**	17.0	4.57	289.47**
V8	-0.7	1.14	-0.85	-2.0	0.39	-1.19	-0.7	-0.91	0.22	-0.4	2.66	0.09**	-161.9	2.51	0.08	25.9	-1.89	11.91
V9	0.4	1.77	0.80	2.0	0.81	19.68**	-0.0	6.30	0.14	0.1	1.27	0.12**	-162.9	2.10	-0.05	-37.0	1.23	40.99*
V10	1.7	1.48	-0.57	0.3	-0.03	-0.22	-1.6	0.67	-0.30	-0.0	0.34	-0.07	-162.7	27.83	0.01	8.8	1.24	0.85
V11	1.7	1.48	-0.57	0.3	-0.03	-0.22	-1.6	0.67	-0.30	-0.3	1.95	-0.08	-162.5	26.24	0.28**	-8.4	0.76	-12.23
V12	-0.2	1.82	-0.87	0.1	0.38	1.43	0.3	1.58	1.26	-0.34	1.14	-0.08	-162.6	-6.74	0.01	8.2	3.69	10.68
V13	0.4	0.96	-0.88	-3.1	0.55	-0.09	-0.2	2.49	4.74**	0.1	2.40	0.05**	-162.7	4.86	-0.01	3.7	3.03	175.65**
V14	0.8	1.13	0.99	-0.3	-3.47	3.46	0.8	1.88	0.78	0.6	0.15	0.21	-162.6	4.09	-0.01	43.9	1.78	11.86
V15	0.6	2.41	-0.46	-1.2	-0.08	7.69*	-0.1	1.70	1.43	0.2	0.93	-0.07	-162.7	1.75	0.01	30.3	2.20	-12.55
V16	-0.2	1.53	-0.94	-0.1	3.60	-1.91	-0.3	1.37	-0.40	0.0	-0.36	0.01	-162.8	6.61	0.01	29.7	0.78	173.13
V17	-0.9	1.25	-0.96	0.9	0.80	-1.06	0.0	4.51	-0.43	0.0	1.03	0.04	-162.6	6.10	-0.01	-48.0	0.79	8.02
V18	0.3	1.95	3.78*	1.4	1.10	-0.39	0.9	3.38	-0.43	-0.2	0.76	0.01	-162.3	12.37	0.01	-44.3	-0.06	12.95
V19	0.3	0.16	4.12*	0.0	2.40	7.33	0.2	1.92	-0.44	-0.4	-0.13	0.09	-162.5	11.57	0.16	-14.7	0.18	-13.42
V20	-0.5	1.21	0.97	2.3	2.92	-2.54	0.3	1.58	-0.30	0.1	1.25	-0.07	-162.8	-1.07	-0.12	-44.9	0.78	-13.23
V21	0.1	1.71	4.09*	0.4	2.89	7.26	0.2	-1.46	-0.36	0.3	2.30	0.35	-162.8	-8.95	-0.01	8.2	0.07	16.21
V22	-0.9	1.03	-0.84	-3.9	3.29	12.07*	-1.7	-4.38	0.47	-0.9	-0.67	0.04	-162.2	-14.92	0.18	4.9	0.37	-13.15

References

Anonymous 2005. FAO. FAOSTAT. Database collection of primary crops.

Anonymous 2010. FAO. FAOSTAT. Database collection of primary crops.

Anonymous 2012. FAO. FAOSTAT. Database collection of primary crops.

Belhekar, P.S., Jadhao, R. Y., Bhor, T. J., Nimbalkar, C. A. and Kande, S. K. (2003). Stability of grain yield and test weight in rice. *Journal of Maharashtra Agricultural Universities,* 28 (2):158-160.

Bose, L. K., Mohanty, A., kar, M. K. and Nagaraju, M. (2004). Stability analysis for grain yield of lowland rice for the largest rice growing region of eastern India. *Korean Journal of crop Science,* 49 (2):136-140.

De, R. N., Reddy, A. V., Rao, Suriya, Ramakrishnayya, G. and Pande, K. L. (1992). Stability of rice yield under different lowland situations. *Indian J. Genet.* 52 (2):139-143.

Dushyantha Kumar, B. M. and Shadakshari, Y. G. (2006). Stability analysis for grain yield and yield components of rice in lowlands of hill zone of Karnataka. *Indian J. Genet*. 66 (2):141-142.

Eberhart, S. A. and Russell, W. A. (1966). Stability parameters for comparing varieties. *Crop Sci*. 6: 36-40.

Ngachan, S.V. 1993. Annual Report. ICAR Research Complex for NEH Region. PP:157.

Prasad, G. S. V., Muralidharan, K., Rao, C. S. And Prasad, A. S. R. (2001). Stability and yield performance of genotypes-A proposal for regrouping world rice area into mega environments. *Current Sc.* 81 (10): 1337-1346.

Reddi Subbi, C. (2002). Performance of rice varieties under different times of planting. *Indian J. Agronomy*, 47 (2): 199-202.

Senapati, B. K. and Sarkar, G. (2004). Adaptability of Aman paddy under Sunderban areas of West Bengal. *Indian J. Genet.* 64 (2): 139-140.

Singh, A. K. and Payasi, S. K. (1999). Stability assessment in early duration genotypes of rice. *Crop Res.* 18 (3):433-436.

Tomar, N. S., Singh, S. P. and Rao, L. V. S. (2004). Stability for yield under rainfed conditions. *Ind. J. Dryland Agril. Res.* 19 (2):123-125.

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