



Yield Component Analysis in Diverse Rice Cultures

Key words : Character Association, Path Analysis, Rice.

Selection for desirable types should not only be restricted to yield alone but other components related to yield should also be considered. As association measures the relationship between two characters and path analysis indicates the relative importance of each factor, study was conducted to find out the efficacy of selection for yield improvement based on yield components in rice.

Seven diverse rice cultures viz., C28, C29, C38, C26S, C26T(a), C26T(b) and C80 along with two local check varieties Jyothi and Ahalya were evaluated in the kole lands of Thrissur district at Adatt during 2002-2003 rabi season. Rice cultures studied were cross progenies of diverse parents (Table 1). The kole lands of Thrissur are at 0.25 - 2.25m below MSL. The cultures were raised in randomized block design with three replications. Ten plants were randomly selected per plot and observations recorded on days to 50 per cent flowering, height of plant at harvest, total number of tillers, number of days for physiological maturity, number of productive tillers, number of spikelets per panicle, number of grains per panicle, 1000 grain weight, grain yield, hulling percentage, milling percentage and head rice recovery. Correlation among characters were worked out (Johnson *et al.*, 1955). Path analysis was carried out (Dewey and Lu, 1959., Singh and Chaudhary, 1985).

Correlations between grain yield and other yield traits were recorded. Grain yield was positively and significantly correlated with number of productive tillers (0.96), total number of tillers (1.05), number of spikelets per panicle (0.98), number of grains per panicle (0.99), 1000 grain weight (0.97) and head rice recovery (0.61) (Table 2). These findings are in agreement with earlier reports (Janardhanan *et al.*, 2001).

Grain yield showed positive association with number of spikelets per panicle. Roy and Kar (1992) and Chauhan *et al.* (1993) also observed positive association of grain yield with number of spikelets per panicle. All the cultures recorded

highly significant and positive relationship between total number of tillers and grain yield as recorded by Mahajan *et al.* (1981). Trait intercorrelation revealed that number of productive tillers was positively associated with number of spikelets per panicle, number of grains per panicle, 1000 grain weight and total number of tillers. These traits showed significant positive correlation among themselves.

Significant and negative correlation of number of days for physiological maturity, days to 50 per cent flowering and height of plant at harvest with grain yield was identified. This was in conformity with the earlier findings (Hargrove *et al.*, 1988). This indicated the possibility to obtain heterosis for grain yield by reducing height and duration.

Path coefficient analysis indicated maximum direct effects of number of spikelets per panicle and 1000 grain weight on grain yield (Table 2). Rajeswari and Nadarajan (1997) also observed number of spikelets per panicle had direct effect on grain yield. Number of grains per panicle exhibited negative direct effect on grain yield but had positive significant correlation with grain yield. This is due to the high indirect effect of number of grains per panicle through number of spikelets per panicle and days to 50 per cent flowering on grain yield. The total number of tillers, number of productive tillers and number of grains per panicle should be considered for selection programme for grain yield indicated by its high indirect effect on grain yield through number of spikelets per panicle and days to 50 per cent flowering. Considering the overall direct and indirect effects along with various associations among different yield attributing traits, it could be concluded that 1000 grain weight and number of spikelets per panicle are to be considered as important parameters for selecting high yielding genotypes of rice.

Table 1. Details of rice cultures used for the experiment

Name of culture	Parentage
C 28	Mahsuri x IR 36
C29	Mahsuri x IR 62030-18-2-2
C 38	Vytilla 3 x Mattatriveni
C 26S	Mahsuri x Vytilla 3
C 26T(a)	Mahsuri x Vytilla 3
C 26T(b)	Mahsuri x Vytilla 3
C 80	PK 3355-5-1-4 x Bhadra
Jyothi (local check)	PTB 10 x IR 8
Ahalya (local check)	(PTB 10 x TN 1) x TN 1

Table 2. Path analysis showing direct and indirect effects of eleven characters on grain yield in rice

Characters	1	2	3	4	5	6	7	8	9	10	11	Correlation with yield
1	0.08	-0.19	-0.18	-2.12	-0.04	-1.03	1.41	1.08	0.17	-0.01	0.06	-0.93**
2	-0.08	0.19	0.18	2.35	0.05	1.05	-1.47	-1.11	-0.25	0.01	-0.05	1.06**
3	-0.08	0.19	0.18	2.18	0.04	1.06	-1.44	-1.05	-0.23	0.01	-0.05	0.96**
4	-0.08	0.22	0.18	2.09	0.04	1.14	-1.46	-1.07	-0.20	0.01	-0.05	0.98**
5	-0.08	0.21	0.18	2.09	0.04	1.11	-1.44	-1.06	-0.21	0.01	-0.05	0.99**
6	0.07	-0.19	-0.18	-2.22	-0.04	-1.07	1.44	1.05	0.28	-0.01	0.05	-0.95**
7	-0.18	0.09	0.08	1.14	0.04	1.08	1.43	-1.06	-0.45	0.01	-0.35	0.97**
8	0.08	-0.19	-0.17	-2.06	-0.04	-1.04	1.39	1.08	0.21	-0.01	0.05	-0.91**
9	0.03	-0.08	-0.07	-0.73	-0.02	-0.52	0.62	0.39	0.58	-0.03	0.01	-0.39
10	0.02	-0.07	-0.06	-0.61	-0.01	-0.47	0.56	0.32	0.58	-0.03	-0.01	-0.38
11	-0.06	0.15	0.12	1.52	0.03	0.87	-1.05	-0.83	-0.08	0.01	-0.07	0.61**

*Significant at 5 per cent level; ** Significant at 1 per cent level; Diagonal values (in bold) represent direct effect

1. Height of plant at harvest, 2. Total no. of tillers, 3. No. of productive tillers, 4. No. of spikelets/ panicle, 5. No. of grains/ panicle, 6. No. of days for physiological maturity, 7. 1000 grain weight, 8. Days to 50% flowering, 9. Hulling %, 10. Milling %, 11. Head rice recovery

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(Received on 21.01.2008 and revised on 02.01.2009)