



Response of Rice Varieties to Establishment Methods under Konkan Conditions

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A field experiment was conducted on Agronomy farm, College of Agriculture, Dapoli, Maharashtra during *Kharif* 2015 to evaluate response of rice varieties to establishment methods under aberrant weather conditions. The experiment was laid out in split plot design with three replications. Twenty four treatment combinations comprised of four main plot treatments viz., drilling (M_1), early transplanting (15 days after sowing) (M_2), transplanting as per recommendation (21 days after sowing) (M_3) and transplanting with *Thomba* method (transplanting without puddling, this is practiced under insufficient rain water for puddling, with the help of pointed bamboo stick holes are made and seedlings are inserted into that holes) (M_4) and six subplot treatments Karjat – 184 (V_1), Palghar – 1 (V_2), Karjat – 2 (V_3), Sahyadri – 2 (V_4), Karjat – 3 (V_5) and Karjat – 7 (V_6). Dibbling of seeds was done on commencement of monsoon for dibbled rice treatment and also for nursery for other treatments. Fifteen days and twenty one days old nursery seedling was transplanted by following a spacing of 20 cm x 15 cm as per treatments. In RDF (100:50:50 NPK kg ha⁻¹), 40 % N and full dose of P and K were applied at the time of transplanting. Remaining 40% N was applied at maximum tillering (30 DAT) and 20% at panicle initiation stage (65 DAT) as per treatments. Urea, single super phosphate and muriate of potash are the sources of fertilizers for RDF. Other cultural practices and plant protection measures were followed as per the recommended package of practices.

Data regarding the number of tillers per hill, number of panicles per hill, length of panicle (cm), grain weight per panicle (g) and test weight (1000 grain weight in g), grain yield (t ha⁻¹) and straw yield (t ha⁻¹) of rice showed significant differences at harvesting due to different establishment methods and varieties and presented in Table 1.

Maximum number of tillers per hill at harvest were recorded in normal transplanting method (9.23) which was at par with early transplanting (8.75), and

transplanting with *Thomba* (8.40) and significantly superior over drilling method (7.34). Different establishment methods significantly affected the number of panicles per hill. Transplanting method of establishment recorded significantly higher number of panicles per hill (8.91) over all the methods and followed by early transplanting (7.69), transplanting with *Thomba* (7.08) and drilling (6.02). Maximum length of panicle (cm) was observed in normal transplanting (23.82 cm) which was at par with early transplanting (22.59 cm) and was significantly superior to transplanting with *Thomba* and Drilling method. Different establishment methods significantly affected grain weight panicle⁻¹ (g). Significantly higher grain weight panicle⁻¹ (g) was recorded in normal transplanting (2.36 g) over rest of the methods viz., early transplanting, *Thomba* and drilling. Maximum 1000 grain weight (g) was observed in normal transplanting (22.37 g) which was at par with early transplanting and transplanting with *Thomba* and was significantly higher than drilling method. Grain yield (t ha⁻¹) and straw yield (t ha⁻¹) as influenced by different establishment methods are given in Table 1. Establishment methods and varieties showed significant variation on grain yield and straw yield. The establishment method normal transplanting as per recommendation was significantly superior over rest of all the treatments. Early transplanting is significantly superior over *Thomba* and drilling while least grain yield and straw yields were recorded in drilling method. These results are similar to those reported by Jagtap *et al.* (2012), Rajiv (2013), Ghasal *et al.* (2014) and Masud *et al.* (2014).

Maximum numbers of tillers at harvest were recorded in variety Karjat-2 (9.25) which was significantly higher than Karjat-184 (7.43) and Palghar-1 (7.94) and was at par with varieties Karjat-3 (8.43), Sahyadri-2 (8.55) and Karjat-7 (8.98). The varieties Karjat-2 and Karjat-7 have recorded significantly higher number of panicles per hill which are significantly higher than the varieties Palghar-1 (6.21) and Karjat-184 (7.23)

Table 1. Number of tillers hill⁻¹, no. of panicle hill⁻¹, length of panicle (cm), grain weight panicle⁻¹ (g), 1000 grain weight (g), grain yield (t ha⁻¹) and straw yield (t ha⁻¹) of rice as influenced by different establishment methods and varieties

Treatments	No of Tillers hill ⁻¹	No. of Panicle hill ⁻¹	Length of panicle (cm)	Grainweight panicle ⁻¹ (g)	1000grain weight (g)	Grain yield (t ha ⁻¹)	Straw yield (t ha ⁻¹)
Methods of establishment							
M ₁ - Drilling	7.34	6.02	20.35	1.39	21.03	3.15	3.78
M ₂ - Early transplanting (15 days after sowing)	8.75	7.69	22.59	1.92	21.93	4.03	4.839
M ₃ - Transplanting as per recommendation	9.23	8.91	23.82	2.36	22.37	4.27	5.12
M ₄ - Transplanting with Thomba method	8.40	7.08	21.81	1.78	21.74	3.41	4.09
Sem ±	0.26	0.24	0.46	0.11	0.27	0.056	0.067
CD at 5 %	0.90	0.84	1.59	0.39	0.93	0.193	0.233
Varieties							
V ₁ - Karjat-184	7.43	7.23	22.70	1.40	17.73	3.17	3.80
V ₂ - Palghar-1	7.94	6.21	22.59	2.00	22.72	3.42	4.10
V ₃ - Karjat-2	9.25	8.13	20.22	1.80	22.39	3.81	4.57
V ₄ - Sahyadri-8.55	7.29	23.22	2.41	25.15	4.26	5.11	
V ₅ - Karjat-3	8.43	7.56	22.02	1.74	22.39	3.59	4.30
V ₆ - Karjat-7	8.98	8.13	22.11	1.83	20.24	4.05	4.86
SEm ±	0.31	0.31	0.39	0.12	0.20	0.117	0.140
CD at 5 %	0.88	0.88	1.12	0.35	0.56	0.334	0.401
Interaction	NS	NS	NS	NS	NS	NS	NS

and are at par with Sahyadri-2 (7.29) and Karjat-3 (7.56). Maximum length of panicle (23.22 cm) was recorded in variety Sahyadri-2 which was on par with Karjat-7 (22.11 cm), Palghar-1 (22.59 cm) and Karjat-184 (22.70 cm) and significantly higher than Karjat-2 (20.22 cm) and Karjat-3 (22.02 cm). Maximum grain weight panicle⁻¹ (2.41 g) was recorded by variety Sahyadri-2 which was significantly higher over all the varieties viz., Karjat-184 (1.40 g), Karjat-3 (1.74 g), Karjat-7 (1.83 g), Karjat-2 (1.80 g) and Palghar-1 (2.00 g). The variety Sahyadri-2 recorded maximum 1000 grain weight (25.15 g) which was significantly superior over Karjat-184 (17.73 g), Karjat-7 (20.24 g), Karjat-2 (22.39 g), Karjat-3 (22.39 g) and Palghar-1 (22.72 g). The varieties also showed significant variation on grain yield. Significantly higher grain yield (4.26 t ha⁻¹) was recorded in variety Sahyadri-2 over Karjat-184 (3.17 t ha⁻¹), Palghar-1 (3.42 t ha⁻¹), Karjat-3 (3.59 t ha⁻¹), Karjat-2 (3.81 t ha⁻¹) and at par with Karjat-7 (4.05 t ha⁻¹). The maximum straw yield (5.11 t ha⁻¹) was recorded in variety Sahyadri-2 which was at

par with Karjat-7 (4.86 t ha⁻¹) and was significantly higher than Karjat-184 (3.80 t ha⁻¹), Palghar-1 (4.10 t ha⁻¹), Karjat-3 (4.30 t ha⁻¹) and Karjat-2 (4.57 t ha⁻¹). These results are in conformity with the results reported by Rajiv (2013), Ghasal *et al.*, (2014) and Masud *et al.*, (2014). New varieties perform better under stress situation mainly because of their better tolerance e.g. in Sundarbans region under flash flooding Swarna-Sub1 showed an average yield advantage of 0.75 t ha⁻¹ and under stagnant flooding Amal-Mana had an average yield advantage of 1.22 t ha⁻¹ (Sarangi *et al.*, 2015).

From the present investigation it can be concluded that for growing *Kharif* rice, crop need to be established by transplanting method with variety *Sahyadri-2* followed by *Karjat-7* to obtain higher yield. However, early transplanting and *Thomba* methods are the alternatives to conventional transplanting method. Because with *Thomba* method rice transplanting can be completed even if insufficient rainwater is there for puddling and comparatively better yield can be obtained.

College of Agriculture
Dr. Balasaheb Sawant Konkan Krishi Vidhyapeeth
Dapoli, Dist. Ratnagiri, Maharashtra- 415 712
E-mail : mauli296@gmail.com

D. N. JAGTAP, U. V. MAHADKAR and
S. A. CHAVAN

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