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Short Communication

A note on relationship of monsoon rainfall with yield of rice (*Oryza sativa* L.) crop at Igatpuri

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The flooded conditions under which rice is grown has a moderating effect on the microclimate. Consequently, the crop is cultivated under a greater range of climatic conditions. Almost half of the rice production area of the world depends entirely on rainfall to supply the water needs of the crop. Therefore, variability of rainfall and it's effect on crop productivity, specially in context of rice production, has been an important subject of study, particularly for areas where farming is rainfed, (Gupta *et al.*, 2000, Rao and Vijaylakshmi 1993, Ramana Rao *et al.*, 1993., Sastri and Patel. 1984). In Igatpuri, about 90% of annual rainfall is received from South West monsoon, 7-9 % from October to February and 1-3 % in the pre-monsoon season. In this region 17000 ha. area cultivated is under rainfed rice farming which shows variability of rice production consequential to variability of rainfall during the monsoon period and events associated with it.

Rainfall data of fifteen years (1987 to 2001) recorded at Agrometeorological Observatory installed at Zonal Agriculture Research Station, Igatpuri farms of Mahatma Phule Krishi Vidhyapeeth, Rahuri (20°N, 74° E and 586 m above msl) were used for analysis. Data regarding productivity of rice for this period has been taken from National Research Project, Igatpuri. Normal dates of onset and withdrawal of South- West monson are 9th June (23 MW) and 24th October (43 MW) respectively, (Jaybhaye, *et al.* 2001) and on average, duration of South-West monsoon is 130 days having 99 rainy days.

Average production during the period of report (Table 1) was 1238 kg ha^{-1} and varied between 810 kg ha^{-1} and 1612 kg ha^{-1} Thus productivity has not been only low but also highly unstable during the period of report. Major area of rice production is rainfed and therefore, larger proportion of the variability in yields can be attributed to rainfall, quantum and it's pattern of distribution during the monsoon months (Table 1). Rice yields showed significant correlations with quantum of monsoon rainfall ($r = 0.48$) and monsoon rainy days ($r = 0.80$).

In the Igatpuri region generally, seed sowing in nursery takes place immediately after intiation of monsoon (23 - 25 mw)

Table 1 : Rainfall features during monsoon months and yield of rainfed rice at Igatpuri (1987-2001).

Sr. No.	Year	Rainfall (mm)		No. of rainy days		Grain yield (kg ha^{-1})
		Annual	Monsoon	Annual	Monsoon	
1	1987	884.2	872.7	83	78	906
2	1988	2850.6	2747.4	103	100	1224
3	1989	2707.3	2664.7	110	101	1298
4	1990	3972.5	3719.4	114	104	1387
5	1991	2844.0	2799.7	87	83	1122
6	1992	2042.3	1999.9	80	75	1017
7	1993	2978.8	2800.6	111	95	1420
8	1994	3837.9	3778.3	97	93	1010
9	1995	1337.5	1254.2	64	51	810
10	1996	2145.2	2040.0	99	92	1365
11	1997	2313.2	2244.6	95	89	1445
12	1998	2393.0	2175.0	104	87	1370
13	1999	2632.2	2374.7	104	91	1582
14	2000	2204.3	1993.9	94	85	1005
15	2001	3069.2	2871.2	94	85	1612

Table 2 : Growth stagewise observed rainfall (mm) and rainy days.

Growth	1987		1992		1994		1995		1999		2001	
Stage	MW	RF	MW	RF	MW	RF	MW	RF	MW	RF	MW	RF
Sowing	23	31.7	25	11.3	23	74.4	24	37.2	23	77.2	24	10.2
Transplanting	27	189.9	29	515.6	27	974.1	28	233.0	27	654.4	28	1308.0
Tillering	32-33	617.4	33-34	998.9	32-33	1626.4	33-34	1000.4	32-33	1158.5	33-34	1329.6
50% flowering	37-38	195.3	38-39	485.4	37-38	1177.8	38-39	0.0	37-38	394.4	38-39	235.8
Dough stage	40-41	11.5	41-42	36.6	40-41	10.0	40-41	88.2	40-41	337.3	40-41	63.3

and transplanting is carried around 27 MW. The tillering, 50% flowering and dough stage are observed during 32-33, 37-38 and 40-41 MW respectively.

However, in a few years, productivity of rice does not match with quantum rainfall received. For rainfed rice, yield variations in these years are attributed to the precipitation received during critical anthesis and reproductive phases (Table 2) Such an influence is observed during (a) low yield

years (1987, 1995), (b) medium yield (1992, 1994) and High yield (1999, 2001) respectively.

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