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# STUDIES ON PLANTING TIME ON PRODUCTIVITY OF

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Field studies were made with three BPH resistant varieties i. e. IET, 7573, TET 7574 and IET 7575 during 1984-85 (karif and rabi seasons) at the Directorate of Rice Research, Rejendranagar farm, to assess the suitability of these varieties under normal and late plantings. The grain yields were assessed with young (25 days) and aged (55 days) seadlings cultivated under two types of planting. It was observed that young seedlings though contributed to more number of tillers and panicles, the spikelet and grain number were low in comparison to old seedlings observed under normal planting. In late planting, there was severe reduction in tillers panicles, spikelets and grains among the two age groups. The study therefore indicates that among the two seasons, use of old seedlings (50-55 days was beneficial under normal planting for realising good yield and exploiting productivity with BPH resistant varieties.

Rice is the most important food crop of India, yet the yield per hectare is low (2. 1 t/ha). Lack of suitable varieties and heavy losses caused by pests are the major factors for low yields. In view of the increased pest problems, especially with brown plant hopper (BPH), intensive resistance screening programme was taken up in a massive scale leading to the development of highly resistant donors (Kalode, Mangal Sain and Bentur et. al. 1983). Of the several leaf hoppers available, BPH is reported to cause extensive yield losses to the extent of 10 to 70 per cent in Kerala (Viswanathan, 1976) accounting to rupees 10 crores during 1973 to 1976 (Dyck and Thomas, 1979). This pest was observed to be widely

prevalent in Andhra Pradesh, Orissa Tamil Nadu and west Bengal. There is need to develop resistant varieties, which will be economical, safe, prevent environment at pollution and forms an important component of integrated pest management system (Veronica, 1985). Consequently several donors were identified possessing multiple resistance (Kalode et al. 1977). Further as the information availablet on the cultivation practices are inadequate in raising these varieties, the present study was taken up to assess the suitability of using these varieties under normal and late planting during kharif and rabi seasons for exploiting potential yields in BPH endemic areas.

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7573  Young seedlings Old seedlings 505 505 500 57,937 23.3 42,103 949 1918  NORMAL PLANTING  (g/m³)	Variatios	: : :-	Number/	Paniclo.	Spikelet "	1000 gr.	- Grain	Grain	Total	Lesf	Days to	Days to
Young seedlings         505         500         57,937         23.3         42,103         949         1918           Young seedlings         505         500         57,937         23.3         42,103         949         1918           7574         Young seedlings         546         535         56.288         21.9         38,266         811         1779           Young seedlings         553         510         71,991         21.5         52,710         1077         1884           7575         Young seedlings         523         511         53,940         23.6         35,346         738         1730           Old seedlings         508         496         55,600         23.5         41,016         924         1913           Young seedlings         566         474         57,630         19.3         18,174         288         1189           7573         Young seedlings         413         381         27,310         19.1         10,534         185         675           Young seedlings         465         453         61,049         18.6         10,779         186         676           Young seedlings         490         478         61,812 <t< th=""><th></th><th>-</th><th></th><th>È</th><th>im.</th><th></th><th>(a/m³)</th><th>(, m/6)</th><th>matter (g/m³)</th><th>xopuj</th><th>-ing</th><th></th></t<>		-		È	im.		(a/m³)	(, m/6)	matter (g/m³)	xopuj	-ing	
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Old seedlings         485         470         69,166         22.7         46,593         983         2044           7574         Young seedlings         546         535         56,288         21.9         38,266         811         1779           Young seedlings         530         510         71,991         21.5         52,710         1077         1884           7575         Young seedlings         523         511         53,940         23.6         35,346         738         1730           Old seedlings         508         496         55,600         23.5         41,016         924         1913           7573         Young seeldings         566         474         57,630         19.3         18,174         288         1189           Young seeldings         465         457,630         19.1         10,534         185         675           7574         Young seeldings         349         320         25,866         18,5         10,779         185         624           Young seeldings         349         320         25,866         19,4         12,603         246         1088		ing seedlings	505	200	57,937	23,3	42,103	949	1918	3.6	111	144
7574         Young seedlings         546         535         56,288         21.9         38,266         811         1779           Old seedlings         530         510         71,991         21.5         52,710         1077         1884           7575         Young seedlings         523         511         53,940         23.6         35,346         738         1730           Old seedlings         508         496         55,600         23.5         41.016         924         1913           7573         Young seeldings         565         474         57,630         19.3         18,174         288         1189           7574         Young seeldings         465         453         51,049         18.6         10,779         185         624           Young seeldings         349         320         25,866         19,5         10,779         185         624           Young seeldings         465         453         61,812         19,4         12,603         246         1088		1 seadlings	485	470	69,166	22.7	46,593	983	2044	3.0	117	149
Young seedlings         546         535         56,288         21.9         38,266         811         1779           Old seedlings         530         510         71,991         21.5         52,710         1077         1884           7575         Young seedlings         523         511         53,940         23.6         35,346         738         1730           Young seedlings         508         496         55,600         23.5         41,018         924         1913           Young seedlings         566         474         57,630         19.3         18,174         288         1189           7574         Young seedlings         465         453         61,049         18.6         18.267         305         1066           Young seedlings         320         25,866         19.5         10,779         185         624           Young seedlings         490         478         61,812         19.4         12,603         246         1088			i de la companya de	2	· 经 · 10	-	,		ě	`# *	-	r
Old seedlings         530         510         71,991         21.5         62,710         1077         1884           7575         Young seedlings         523         511         53,940         23.6         35,346         738         1730           Old seedlings         508         496         55,600         23.5         41.016         924         1913           7573         Young seeldings         566         474         57,630         19.3         18,174         288         1189           7574         Young seeldings         465         453         61,049         18.6         18,57         305         1066           7574         Young seeldings         349         320         25,866         19,1         10,779         185         624           7576         Young seedlings         490         478         61,812         19,4         12,603         246         1088	Ū.,	ing soedlings	546	535	56,288	21.9	38,266	811	1779	4.7	116	148
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Young seedlings         523         511         53,940         23.6         35,346         738         1730           Old seedlings         508         496         55,600         23.5         41,016         924         1913           7573         Young seeldings         565         474         57,630         19.3         18,174         288         1189           Old seedlings         413         381         27,310         19.1         10,534         185         675           Young seeldings         465         453         51,049         18.6         18,267         305         1066           Old seedlings         349         320         25,866         19,5         10,779         185         624           Young seedlings         490         478         61,812         19.4         12,603         246         1088		22										,
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7573           Young sooldings         565         474         57,630         19.3         18,174         288         1189           Old soodlings         413         381         27,310         19.1         10,534         185         675           7574         Young soeldings         465         453         51,049         18.6         18.267         305         1066           Old soedlings         349         320         25,866         19,5         10,779         185         624           Young soedlings         490         478         61,812         19,4         12,603         246         1088		<b>2</b> :		.==		TE PLANT			4.	ŧ	-	
Young seeldings         566         474         57,630         19.3         18,174         288         1189           Old seedlings         413         381         27,310         19.1         10,534         185         675           7574         Young seeldings         465         453         51,049         18.6         18.267         305         1066           Old seedlings         349         320         25,866         19,5         10,779         185         624           Young seedlings         490         478         61,812         19,4         12,603         246         1088		33		4								
Old seedlings         413         381         27,310         19.1         10,534         185         675           7574         Young seeldings         465         453         61,049         18.6         18.267         305         1066           Old seedlings         349         320         25,866         19,5         10,779         185         624           7576         Young seedlings         490         478         61,812         19,4         12,603         246         1088		spaidings par	565	474	57,630	19.3	18,174	288	1189	4.4	140	167
7574 Young seeldings 465 453 51,049 18.6 18.267 305 1066 Old seedlings 349 320 25,866 19.5 10,779 185 624 7576 Young seedlings 490 478 61,812 19.4 12,603 246 1088		t seedlings	413	381	27,310	19.1	10,534	185	675	2.7	145	178
Young seeldings         465         453         61,049         18.6         18.267         305         1066           Old seedlings         349         320         25,866         19,5         10,779         185         624           7576         Young seedlings         490         478         61,812         19,4         12,603         246         1088	1	**	٠.	(e)	á.			: ::				
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CONTRACTOR OF THE PARTY OF THE		ing seedlings	490	478	61,812	19,4	12,603	246	1088	4.9	142	168
Old saedlings 351 326 25,560 20,4 11,052 201 /32		Old seedlings	351	326	25,560	20:4	11,052	201	732	2.7	149	182

#### MATERIALS AND METHODS

The experiment was laid out at the Directorate of Rice Research farm, Rejendranagar, Hyderabad, for two consegutive seasons (kharif and rabi) during 1984 - 85 with three medium duration varieties i. e., IET 7573, IET 7574 and IET 7575 by adopting standard cultural practices. The varieties were planted in two sets, one set planted in normal time while the other was delayed nearly by two months. Seedlings were raised as young (25 days) and old (55 days) by adopting staggered sowing. The yield and yield components were assessed following the observations recorded in the field. Standard and accepted procedures were adopted for determining the quantitative aspects by using replicated samples. The crop was harvested at 30 days after 50 per cent flowering and the information on days to flowering and maturity, 1000 grain weight and biometric characters like leaf area index and total dry matter were recorded.

## RESULTS AND DISCUSSION

Results pertaining to the two types of planting are discussed especially with young, and old seedlings with regard to their potential sink capacities.

Kharif season :

In normal planting taken up during kharif 1984, young seedlings produced more number of tillers and

panicles (Table 1). But reduction in spikelet and grain number was observed in young seedlings (25 days) in comparison to old seedlinge (55 days). Increased production of spikelet and grain number contributed to higher production of yield among aged seedlings. However, all the varieties yielded similar results. Further. the results indicated that higher total dry matter production influenced the net photosynthetic efficiency by mobilising the stored carbohydrares towards the development of panicle which influenced higher production in spikelets and grains and thereby enhanced grain yields in aged seedlings. While the data on leaf area index showed slightly higher values in young seed!ings than in aged seedlings indicating its influence only on vegetative phase,

In late planting, aged seedlings flowered and matured earlier (20 - 24 days) than young seedlings. However, in comparison to normal planting, observations on tillers, panicles, spikelets and grains showed drastic reduction in the two age groups. Among the two, young seedlings performed better than the older group in all the plant components. The older seedlings matured earlier than the younger seedlings by 15 - 20 days. However, the total reduction in grain vield among young and old seedlings was 60 to 70 per cent, when compared to normal planting. Besides, there was significant reduction in 1000 grain weight in late planting suggesting the limitation of its practice.

Table 2. Effect of normal and late plantings on rice productivity in BPH resistant varieties - frabi, 1985)

Variaties Tiller P  Variaties number/ n  IET 7573  (a) Young seedlings 508  (b) Old seedlings 553  (c) Young seedlings 553  (d) Young seedlings 553  (e) Old seedlings 558  (f) Young seedlings 568  (h) Old seedlings 606	Panície numbor/ m*	Spikelet	1000 gr	Grain gumber/	Grain	Total	Loof	Days to	Days to
7573  Young seedlings 535  Old seedlings 553  Young seedlings 553  7575  Young seedlings 553  Old seedlings 553  Old seedlings 568	m, m,	nitmber!	Wt. (0)	"John hory	の の できる できる の		1. 野田 沙港		
7573  Young seedlings 535  Old seedlings 541  Young seedlings 553  7575  Young seedlings 553  Old seedlings 508  Old seedlings 606		, E		**	yield (g/m²)	dry matter (g/m³)	index	flower ing	maturit
7573  Young seedlings 535  Old seedlings 541  Young seedlings 553  7575  Young seedlings 553  Old seedlings 508  Old seedlings 606									-
7573         Young seedlings       535         Old seedlings       541         Young seedlings       553         7575       553         Young seedlings       553         Old seedlings       508         Old seedlings       606	. 4	NO	NORWAL PLANTING	TING					
Young seedlings         636           Old seedlings         508           7574         541           Young seedlings         553           7575         553           Young seedlings         508           Old seedlings         508           Old seedlings         606			_3				4	•	
Old seedlings         508           7574         Young seedlings         541           Young seedlings         553           7575         Young seedlings         508           Old seedlings         606	523	68,988	19,0	54,412	943	1864	9.9	138	169
Young seedlings 541 Old seedlings 553 7575 Young scedlings 508 Old seedlings 606	469	64,238.	19.8	56,124	992	1850	8,1	139	172
Young seedlings 553 7575 Young seedlings 508 Old seedlings 606		-						a.	
Old seedlings 553 7575 Young scedlings 508 Old seedlings 606	530	66,195	19.6	54,015	868	1949	11.7	136	167
7575 Young scedlings 508 Old seedlings 606	528	61,575	19.0	51,661	852	1865	8 3	131	164
Young scedlings 508 Old seedlings 606			1			1			
Old seedlings 606	494	56,554	19.9	44,584	715	1500	8.6	136	167
	569	75,729	189	64,798	808	1917	9.2	139	172
,		7	LATE PLANTING	N.G					
167 7573									
(a) Young seedlings 490	476	63,892	18.3	44,639	969	1952	4.	121	148
(b) Old seedlings 516	202	63,904	19,9	47,028	859	2445	3.7	134	159
			35			,	3	100	1
(a) Young seedlings 373	366	46,412	17.6	42,042	189	1753	9	121	148
Old scodlings 473	451	57,823	18,8	37,692	999	2314	3.0	134	159
				1	000		į		
Young seedlings 405	395	43,919	18.2	37,128	688	1756	4.6	123	120
Old seedlings 493	471	60,681	20.1	44,765	847	2308	3,1	134	159
		ž							17

Rabi season: The study was continued during rabi 1985 with 3 BPH resistant varietes under normal and late planting. The grain yields were assessed with the two age groups cultivated under two types of planting (Table 2).

Among the two plantings, the yields were significantly more in normal planting uniformly for all the 3 varieties. In late planting, the yields were reduced as the varieties suffered with less production of tillers, panicles, spikelets and grains along with severe reduction in leaf index. Daysto: flowering and maturity was however, reduced by 5 to 10 days in late planting.

These studies would, suggest that the performance of old seedlings (50-55 days) was good in getting better yields with increased spikelet and grain number. These results were in conformation of the data presented by Chandra and Manna (1983) and Gill and Sahi (1986). Therefore, use of aged seedlings (50 - 55 days) under normal planting may be recommended in both kharif and rabi seasons while using these varieties for cultivation in BPH endemic areas.

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