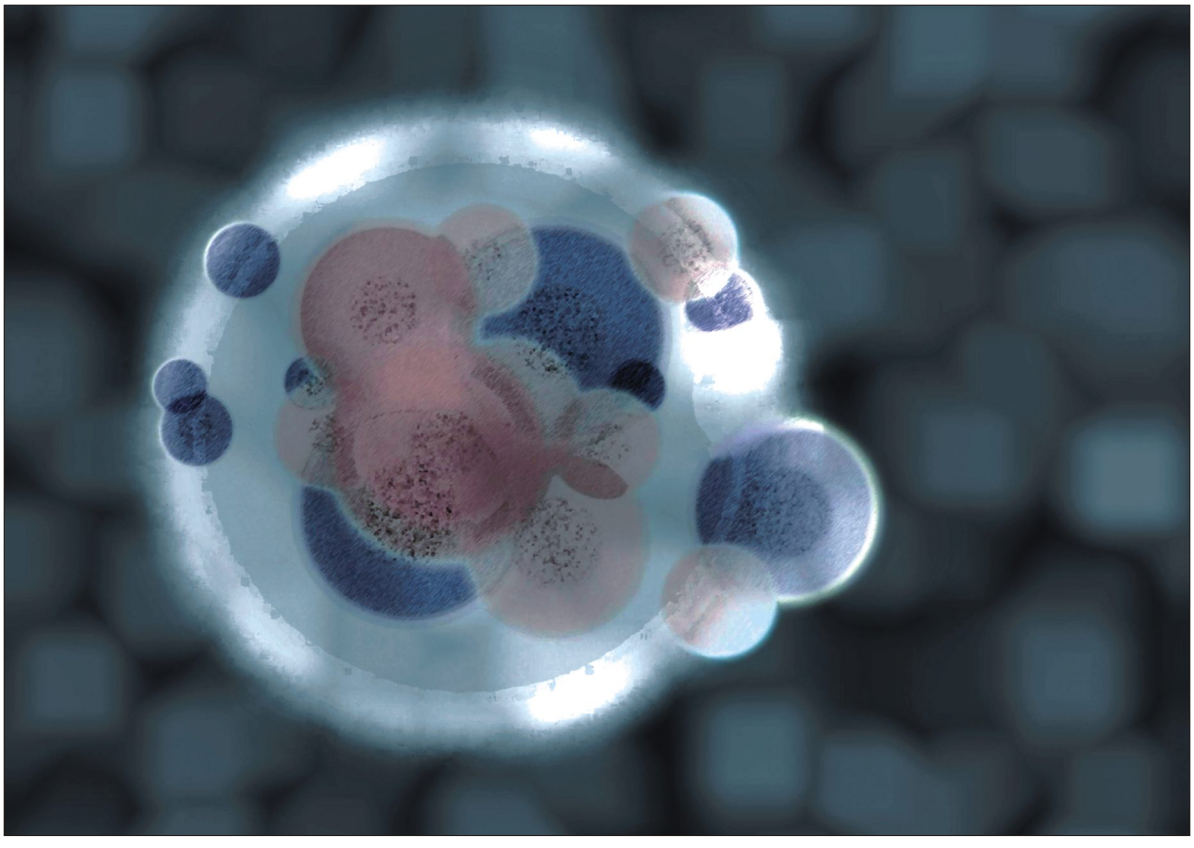

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Effect of Transplanting Dates on Yield and its Related Traits in Rice (*Oriza sativa* L.)

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Abstract: Study envisaged that early planted (May,16) rice taken greater days to heading (110.4 days), maturity (136.0 days) and plant height (102.25 cm). However, number of panicles/hill (19.75), grains/panicle (109), grain weight/hill (79.13 g), 1000 grain weight (36.10 g) and grain yield (5750 kg ha^{-1}) were significantly greater in 1st June planted rice. Thus, it is recommended that transplanting during the first week of June is ideal for achieving maximum grain yield.

Key words: Rice-Transplanting Dates-Yield and Growth

Introduction

Rice *Oriza sativa* (Linn) is one of the most important cereal crop in the world. It is also one of the principal food grains and staple diet of majority of the people in Pakistan. It is major commodity which is exported and contributes approximately 15% of the total foreign exchange earnings (Mallah, 1987). In Pakistan rice is grown on an area of about 2300 thousand hectares with a total annual production of 4584 thousand tons. However, in Sindh province the area under rice crop is about 690 thousand hectare with an annual production of 2123 thousand tons (Anonymous, 2000). Yield obtained at present is low as compared to other rice growing countries like Philippines, China, Thailand and Burma in the world. This might be lack of improved production technologies. Among various package of production technologies transplanting dates play a pivotal role in the development of rice crop. Jiang and Zhou (1987) conducted pot trials in 1986 and planted rice on 5th, 15th or 25th July, revealed that sowing of rice on 25th July was more conductive to produce better yield as compared to planting dates of 5th and 15th July. However, Patel *et al*. (1987) conducted field experiments during 1981-83, where rice seeds were sown between 1st November and 15th December and the seedlings transplanted after 45, 55 or 65 days. Grain yield ranged from 3.3 t.ha^{-1} with 65 day old transplants from seeds sown on 15th December to 6.2 t.ha^{-1} with sowing on 30th November and transplanting after 55 days. Generally, early sowing dates gave higher yields with older seedling transplants and late sowings gave higher yields with younger seedlings. Kim *et al*. (1991) conducted field trials on transplanting rice on 10th, 20th or 30th May and 10th, 20th June. They observed higher yields due to the critical last sowing dates based on the cumulative temperature for ripening of some varieties of rice. Lee *et al*. (1991) reported that rice cv. Donghaebyeo sown on 10th, 20th and 30th May, and 10th and 20th June gave grain yields of 4.52, 4.67, 4.57, 4.49 and 4.03 t.ha^{-1}, respectively, and 1000 grain weight of 20.5, 19.8, 20.3, 20.5 and 21.4 gram. Thus, present study was under taken to evaluate the effect of different sowing dates on the growth and yield of rice in the agro-ecological conditions of Thatta, Pakistan for achieving higher yields and self-sufficiency in paddy production.

Materials and Methods

Experiment was conducted during Kharif season of 1998, to study the effect of different transplanting dates on the growth and yield of rice variety DR-92, in the experimental area of Rice Research Station Thatta. The experiment was laidout in Randomized Complete Block Design (RCBD) with four replications having a net plot size of 4×4 m^2. Twenty two day old seedlings of rice variety DR-92 were transplanted on 16th May, 23rd May and 1st June in a row and plant distance of 20×20 cm. A Basal fertilizer dose of 40-90-50 NPK kg ha^{-1} was applied prior to transplanting in the well puddled soil in the form of Urea, DAP and SOP respectively. While rest of nitrogen (80 kg ha^{-1}) was splited and top dressed at the time of various crop developmental stages. Zn as Zinc Sulphate was applied at the rate of 15 kg ha^{-1} to make the crop more vigorous.

Results and Discussion

Growth Parameters: Rice transplanted on May, 16th resulted prolonged days to flower, crop maturity and taller plants. However, further delay in transplanting resulted in shorter

Table 1: Growth and yield components of rice variety DR-92 as affected by different transplanting dates

Transplanting dates	Days to flowering	Days to maturity	Plant height (cm)	panicles/ hill	grains/ panicle	Grain/ weight l hill (g)	Seed index (1000 grains wt., g)	Grain yield/ha (kg)
16th May	110.40a	136a	102.25a	15.00c	96c	65.00c	30.10b	4140.63c
23rd May	106.50b	128b	97.25b	16.00b	100b	71.00b	32.00b	4875.00b
Ist June	103.75c	121c	91.75c	19.75a	109a	79.13a	36.10a	5750.00a
S.E.	0.874	0.913	1.00	0.311	1.179	2.037	0.868	191.887
LSD1	2.141	2.237	2.450	0.762	2.889	4.991	2.127	470.123
LSD2	3.243	3.387	3.710	1.154	4.374	7.557	3.220	711.901

Values followed by similar letter, are not significantly different at $p<0.05$ % level

days to flower, crop maturity and plant height. This might be due to sufficient time to crop stay in the field which facilitated the plants to improve the photosynthesis activities which in turn caused longer days to flower and maturity and taller plants. However, number of panicles/hill and grains/hill were superior in case of later (1st June) transplanted crop. While early transplanted rice produced lesser panicles/hill and grains/panicle. This may be due to availability of favourable temperature during panicle and grain initiation period in 1st June transplanted crop. Similar results have also been reported by (Jiang and Zhou, 1987).

Yield and yield components: Rice transplanted on June 1st caused higher grain weight, seed index and grain yield, whereas, early transplanted crop produced lower seed weight and seed index which in turn caused poor grain yield. These results are supported by the finding of Lee *et al*. (1991) and Patel *et al*. (1987).

It may be inferred from the present findings that June 1st was the ideal transplanting time for growing rice crop in Thatta area. Early or intermediate planted crop took greater flowering and maturity days also produced taller plant. While later planted crop produced more number of panicles/hill, grains/panicle, grain weight/hill, and seed index which resulted in greater grain yield. This demonstrates that June planted crop achieve favourable temperature for photosynthesis activity in contrast to the early sown rice crop. The greater photosynthesis activity resulting in bolder and heavier seed which is an assurance of more grain yield (Table 1).

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