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Studies on Age of Seedlings in Late Sown Wheat Varieties

By

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ABSTRACT

An agro-physiological study was carried out during winter seasons of 1972—'73 and 1973—'74 at the U. P. Institute of Agricultural Sciences, Kanpur to compare the direct seeded crop of wheat with transplanting to select suitable varieties and to fix optimum age of the seedlings for transplanting. Transplanting of wheat was found better than direct seeding. Moti was the best for transplanting in mid December, closely followed by K 816 for late December and in mid January. Twenty five day old seedlings were observed to perform well.

INTRODUCTION

A rapid increase in the rate of reduction in wheat yield due to corresponding delay in its sowing has been reported by Singh *et al.* (1971) and Mehta and Mathur (1972). Under such conditions, transplanting of wheat was found to be a very good alternative to direct seeding particularly in the month of January (Dhillon and Panwar, 1971 and Sharma and Gupta, 1972). Yield level of the transplanted crop could be improved by the use of seedlings of optimum age of suitable varieties at different dates. A field experiment was undertaken to find out suitable varieties and optimum age of their seedlings for transplanting.

MATERIALS AND METHODS

The experiment was conducted at Students' Instructional farm of Agronomy Division, U. P. Institute of Agricultural Sciences, Kanpur during winter seasons of 1972—'73 and 1973—'74 in split plot design with three replications. Three dates of direct seeding as well as transplanting (December 15, 30 and January 14) alongwith three ages of seedlings (25, 35 and 45 days' old) were allotted to main plots and four varieties (Moti, K 816, K 802 and Sonalika) to sub-plot treatments. Net plot was 4.5 × 3.3m.

One eighth of the area to be transplanted was kept under nursery for each variety. Double the thousands' grains weight in g was used as the seed rate in kg/ha. Half of the dose of 120 kg N/ha and all the phosphorus (80 kg/ha) and potash (60 kg/ha) were applied and mixed well in soil before transplanting. The rest of N (60 kg N/ha) was topdressed in two equal doses after the 2nd and the 3rd irrigations. Transplanting was done in a finely prepared dry seedbed with the help of small wooden plough followed by a light irrigation. Two seedlings per hill were used at a spacing of 15×5 cm. Recommended irrigation and plant protection schedules were followed throughout the crop span.

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RESULTS AND DISCUSSION

Since all the interactions as well as main effects have been found significant during both the years, it would be more logical to discuss the interactions only rather than their main effects.

Transplanting vs direct seeding: The practice of transplanting, on an average, increased the yield of grain significantly over direct seeding during both years even when different varieties and seedlings of their variable ages were used in transplanting (Table 1). A short statured (Three gene dwarf) variety Moti (H D. 1949) gave higher yields in both years while Sonalika (H. D. 1953) closely followed by K 816 (three gene dwarf) in the first year and K 816 in the second year were found superior among all. Profuse and sinchrony in tillering probably helped the Moti seedlings in their quicker establishment where the short duration was possibly an advantage to wheat variety K 816 as well as to the single gene dwarf Sonalika.

TABLE 1. Grain yield (q/ha) of dwarf varieties of wheat recorded under direct seeding and transplanting conditions

Method of Sowing	Moti	K 816	K 802	Sonalika	Mean	C. D. at 5% for varieties
			1972—'73			
Transplanting	41.76	33.38	30.38	33.60	34.78	1.71
Direct sowing	34.67	34.93	27.86	31.30	32.19	3.42
Mean	38.22	34.15	29.12	32.45	33.48	0.66
			1973—'74			
Transplanting	39.77	36.45	30.88	29.66	34.19	1.72
Direct sowing	30.60	32.01	25.33	27.33	28.82	2.98
Mean	35.19	34.23	28.11	28.50	31.51	1.49

C. D. at 5%	Transplanting vs sowing	Transplanting vs sowing x varieties
1972—'73	2.55	2.70
1973—'74	2.29	2.43

Transplanting dates X ages of seedlings: Superiority of 25 days old seedlings followed by 35 days old in first year and 25 days old seedlings in second year indicated 25 to 30 days old seedlings to be optimum for mid December transplanting while 25 to 35 days and 25 to 45 days age may be considered optimum for transplanting in late December and mid January respectively (Table 2). Thirty and 35 days old seedlings have earlier been recommended by Sharma and Gupta (1972) and Rathi and Autar (1973) respectively. Inferiority of 45 days old seedlings particularly in earlier transplantings may probably be due to initiation of tillering in the nursery due to high temperature and injury to the newly emerged tillers during transplanting.

TABLE 2. Grain yield (q/ha) as influenced by different dates of transplanting and variable ages of wheat seedlings

Dates of Transplanting	Age of seedlings in days			
	25	35	45	Mean
1972—'73				
December 15	44.04	41.38	31.61	39.01
December 30	42.66	35.23	32.73	36.88
January 14	31.22	25.96	28.21	28.46
Mean	39.30	34.19	30.85	34.70
1973—'74				
December 15	42.49	39.75	33.98	38.74
December 30	37.25	35.00	33.24	35.16
January 14	28.25	30.49	27.27	28.67
Mean	36.00	35.08	31.50	34.19

C. D. at 5%	Dates	Age	Interaction
1972—'73	3.12	3.12	5.41
1973—'74	1.48	1.48	2.57

Varieties X Transplanting dates / age of seedlings: Grain yield data presented in Table 3 clearly show that Moti was the only variety suitable for mid December transplanting while it could be replaced by another variety K 816 in late December and by Sonalika or K 816 in mid January. Optimum age of seedlings was found to be between 25 and 35 days for Moti and Sonalika and 25 days for K 816.

TABLE 3. Grain yield (q/ha) of dwarf varieties of wheat recorded under different dates of transplanting and age of their seedlings

Treatments	Moti	K 816	K 802	Sonalika
1972—'73				
Dates of transplanting:				
December 15	51.24	36.01	32.73	36.07
December 30	44.92	36.61	32.29	33.68
January 14	29.13	27.53	26.13	31.04

TABLE 3 (Contd.)

Treatments	Moti	K 816	K 802	Sonalika
Age of seedlings:				
25 days	47.80	40.66	30.29	38.47
35 days	40.54	33.41	29.41	33.41
45 days	36.95	26.08	31.45	28.91
1973—'74				
Dates of transplanting:				
December 15	48.30	38.66	35.01	32.98
December 30	40.33	38.33	32.00	30.00
January 14	30.68	32.35	25.63	26.01
Age of seeds:				
25 days	41.00	42.34	28.32	32.32
35 days	42.00	37.68	30.30	30.33
45 days	36.30	29.32	34.01	26.34

C. D. at 5%	Dates × Varieties	Age × Varieties
1972—'73	1.30	1.30
1973—'74	2.98	2.98

Dates X age X varieties: The results discussed above are also confirmed by the data furnished in Table 4 under higher order interactions where Moti, during both the years, gave highest yield with 25 days' old seedlings on December 15, closely followed by K 816 (with the same duration of seedlings on December 30 while K 816 with 25 days' old seedlings) may be one of the good alternatives to Moti in mid January.

TABLE 4. Grain yield (q/ha) of dwarf varieties of wheat recorded under the interactions of dates and age of seedlings

Varieties	Dates of Transplanting								
	Age in days			Age in days			Age in days		
	25	35	45	25	35	45	25	35	45
1972—'73									
Moti	56.66	51.34	45.71	49.35	45.36	40.04	37.38	24.91	25.10
K 816	45.71	38.40	23.93	43.87	37.07	28.90	32.41	24.75	25.42
K 802	31.40	34.06	32.73	36.06	28.08	32.73	23.42	26.08	28.90
Sonalika	42.39	41.72	24.09	41.37	30.42	29.25	31.65	28.08	33.40

TABLE 4 (Contd.)

				1973—'74					
Moti	51.99	50.00	42.92	45.01	40.01	35.96	26.01	35.99	30.03
K 816	48.00	40.00	27.98	42.01	38.00	34.98	37.02	35.03	25.00
K 802	32.00	34.00	39.02	29.99	31.99	34.01	22.98	24.91	29.01
Sonalika	37.95	34.98	26.01	30.00	30.00	28.00	27.00	26.01	25.02

Years	1972—'73	1973—'74
C. D. at 5%	5.93	5.16

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