

Suitability of cotton and wheat varieties for cotton-wheat system

A.S. Kharub, V.K. Sharma* and D.S. Chauhan

Resource Management Programme, Directorate of wheat research, KARNAL (HARYANA) INDIA

ABSTRACT

A field experiment was conducted at research farm of Directorate of Wheat Research, Karnal to evaluate six varieties of cotton and four varieties of wheat for their performance and maturity under raised and flat bed planting system. Seed cotton yield under flat and raised bed was similar. Different cotton varieties produced differently. During 2000-01 and 2001-02, the seed cotton yield was significantly differ among varieties and during 2002-03 there was no significant difference in seed cotton yield of different varieties. On an average, the lowest seed cotton yield was in RS 875 (14.62q/ha) and the highest was in LH 900 (19.81q/ha). Cotton varieties RS 810, LH 1556 and H 1098 were at par with LH 900 in seed cotton yield. The wheat yield was at par after all the cotton varieties except RS 810 after which wheat yield was comparatively lower than others. The wheat yield under RS 875 was higher because of early maturity of cotton and timely sown of wheat. Wheat yield of PBW 343 and PBW 373 were at par and significantly higher than other two varieties. Flat bed or traditional system has an advantage over raised bed system in wheat equivalent yield. The wheat equivalent yield was at par under LH 900, LH 1556 and H1098 (cotton varieties). The wheat equivalent yield was significantly higher and at par under wheat varieties PBW343 and PBW 373 compared to other wheat varieties. The best crop sequence fitted in to the C-W system was LH1556/LH 900 – PBW 343/PBW 373.

Key words: Cotton and Wheat varieties, Planting system.

INTRODUCTION

Cotton-wheat system is the main cropping system after rice-wheat which occupies an area of 2.5 m ha in the Indo-Gangetic plains of India There are reports of yield stagnation and decline in soil productivity due to continuous adoption of exhaustive crops. The decline in crop yield could be minimised by introduction of suitable varieties of cotton and wheat. These two crops took whole year to mature and even overlapping one maturity time to other sowing time, delaying the sowing of both crops but more delayed was noticed in case of wheat sowing due to late maturity of cotton. Therefore, a need was felt to evaluate different varieties of cotton and wheat for their best performance under raised and flat bed planting methods.

MATERIALS AND METHODS

A field experiment was conducted at research farm of Directorate of Wheat Research, Karnal for three years, 2000-01 to 2002-03. The experimental soil was loam in texture (56 % sand, 30% silt and 14% clay), low in organic C (0.37%) and available N (139 kg/ha), medium in available P (17.6 kg/ha) and low in K (131 kg/ha) content. Six varieties of cotton namely RS 875, H 1098, LH 900, LH 1556, RS 810 and RS 2013 and four varieties of wheat namely PBW 343, PBW 373, UP 2425 and Raj 3765 were evaluated for their performance and maturity under two planting methods (raised bed and flat) in a split plot design with three replications. These varieties were chosen according to maturity period and popular varieties of the season. The fertilizers and other inputs were applied to different crops as per recommended practice. Irrigation was applied on the basis of critical physiological stages of different crops. Recommended pesticide spray schedule was adopted. The productivity of different crop sequences

were compared by converting the yield of cotton into wheat equivalent on the basis of minimum support price/ prevailing market price.

RESULTS AND DISCUSSION

Seed cotton yield under flat and raised bed was similar for all the years. On an average, seed cotton yield was 18.5 and 18.26 q/ha under raised and flat bed, respectively (Table 1). The highest yield (20.82 q/ha) was obtained in the year 2002-03 under raised bed conditions and the lowest (16.57 q/ha) was also in raised bed during 2001-02. Different cotton varieties produced differently. During 2000-01 and 2001-02, the seed cotton yield was significantly differ among varieties and during 2002-03 there was no significant difference in seed cotton yield of different varieties. The seed cotton yield varies from 13.34 q/ha in RS 875 during 2001-02 to 21.50 q/ha in LH 1556 during 2002-03. On an average, the lowest seed cotton yield was in RS 875 (14.62q/ha) and the highest was in LH 900 (19.81q/ha). Cotton varieties RS 810, LH 1556 and H 1098 were at par with LH 900 in seed cotton yield.

The cotton variety RS 875 mature early and wheat was sown in 2nd week of November but all other cotton varieties were mature up to last week of November and wheat was sown in 1st week of December. After cotton wheat was sown in two rows on beds of 67 cm wide under raised bed situations and on flat the distance between the rows was 20 cm. Flat beds or traditional system has an advantage over raised bed system in wheat productivity (Table 2). Wheat yield was 38.6 q/ha and 49.0 q/ha under raised bed and flat bed system, respectively. On an average, the wheat yield was at par after all the cotton varieties except RS 810 after which wheat yield was comparatively lower than others. The wheat yield under RS 875 was higher because of early maturity of cotton and timely sown of wheat. On an average,

*Author for corospondence, Present Address : Regional Agricultural Research Station, SKUAST(K), P. Box. 146, Leh (J&K)

Table 1: Seed cotton yield (q/ha) as affected by planting methods and varieties

Planting method/ varieties	2000-01	2001-02	2002-03	Mean
FIRBS/raised beds	18.13	16.57	20.82	18.5
Flat bed	17.91	17.76	19.11	18.26
Mean	18.02	17.16	19.96	18.38
CD (0.05)	NS	NS	NS	
RS 875	15.90	13.34	-	14.62
H 1098	18.64	18.46	20.06	19.05
LH 900	19.75	19.43	20.26	19.81
LH 1556	17.81	18.01	21.50	19.10
RS 810	-		19.05	19.05
RS 2013	-	16.49	18.96	17.72
Mean	18.03	17.14	19.96	18.03
CD (0.05)	2.43	2.54	NS	

Table 2: Wheat productivity (q/ha) as affected by planting methods and varieties

Planting method/ varieties	2000-01	2001-02	2002-03	Mean
FIRBS/raised beds	46.4	41.6	27.8	38.6
Flat bed	52.9	52.0	42.2	49.0
Mean	49.6	46.8	35.0	43.8
CD (0.05)	3.61	4.07	3.03	
After RS 875	47.6	44.4	-	46.0
After H 1098	49.2	44.1	32.7	42.0
After LH 900	51.1	49.7	34.3	45.
After LH 1556	50.5	45.1	34.8	43.5
After RS 810	-		33.0	33.0
After RS 2013	-	50.9	40.2	45.6
Mean	49.6	46.8	35.0	42.5
CD (0.05)	2.11	2.38	1.76	
PBW 343	50.6	47.8	39.5	46.0
UP 2425	47.6	45.2	31.7	41.5
Raj 3765	49.1	46.3	29.1	41.5
PBW 373	50.6	48.3	39.8	46.2
Mean	49.5	46.9	35.0	43.8
CD (0.05)	1.6	1.93	1.86	

wheat yield of PBW 343 and PBW 373 were at par and significantly higher than other two varieties in all the years.

The wheat equivalent yield was estimated on price basis and compared system productivity. Flat bed or traditional system has an advantage over raised bed system in wheat equivalent yield (Table 3) mainly because of more wheat yield under flat system. The wheat equivalent yield

was highest (101.5q/ha) under cotton variety LH 900. On an average, the wheat equivalent yield was at par under, LH 900, LH 1556 and H1098. The wheat equivalent yield was significantly higher and at par under wheat varieties PBW343 and PBW 373 compared to other wheat varieties. On the basis of results of cotton and wheat experiments, best crop sequence fitted in to the C-W system was LH1556/

Table 3 : Wheat equivalent yield (q/ha) as affected by planting methods and varieties

Planting method/ varieties	2000-01	2001-02	2002-03	Mean
FIRBS/raised beds	105.9	85.7	83.4	91.7
Flat bed	112.3	99.5	92.1	101.0
Mean	109.1	92.6	87.8	96.5
CD (0.05)	4.57	6.57	3.03	
RS 875	99.7	80.0	-	89.8
H 1098	112.1	93.0	86.1	97.1
LH 900	115.0	101.6	87.8	101.5
LH 1556	109.3	93.4	92.0	98.2
RS 810	-	-	83.7	83.7
RS 2013	-	94.8	90.8	92.8
Mean	109.0	92.6	88.1	93.8
CD (0.05)	3.12	4.61	3.75	
PBW 343	109.9	93.6	92.7	98.7
UP 2425	107.2	91.1	84.8	94.4
Raj 3765	109.1	91.8	82.2	94.4
PBW 373	109.9	93.9	92.5	98.8
Mean	109.0	92.6	88.1	96.6
CD (0.05)	2.46	3.93	2.82	

LH 900 – PBW 343/PBW 373. System based screening of cotton and wheat varieties were not reported from anywhere as yet.

It can be concluded that growing of recommended varietal sequence enhance the productivity of the system by increasing yield and proper sowing and maturity period of the cotton wheat varieties.

REFERENCE

Hobbs, P.R. (1984). Agronomic practices and problems for wheat following cotton and rice in Pakistan. In Villareal, R.L., Klatt, A.R. (eds). 1985. A proceedings of the International symposium on wheats for more tropical environments. Mexico, DF (Mexico) CIMMYT. 273-276.

Received : March, 2006; Accepted : September, 2006