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COMPARATIVE STUDY OF YIELD AND ITS YIELD CONTRIBUTING TRAITS OF DIFFERENT GENOTYPES IN WHEAT

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ABSTRACT
Wheat is the most important food crop of India and is a main source of protein and energy for human diet. The experiment was conducted at Research Farm, IGKV, Raipur during *Rabi* 2013-14. Twenty two wheat genotypes including checks were grown in Randomized Block Design with three replications. Chhattisgarh is located in the east - central part of the country between 17°14'N and 24°45' N latitudes and 73°30' E and 84°15' E longitudes, whereas Raipur the capital of the Chhattisgarh state, lies at 21°16' N latitude and 81°36' E longitude with an altitude of 289.60 meters above sea level. Five randomly selected plants from each treatment were tagged for recording the observations on the following characters, *viz*., days to 50% flowering, days to maturity, plant height, number of tillers per plant, spike length, number of spikelets per spike, number of seeds per spikelet, number of seeds per spike, number of seeds per plant, 1000-seed weight, seed yield per plant, biological yield per plot, seed yield per plot and harvest Index. The present experiment was conducted and estimates of mean, ranges se and cv of quantitative characters. Days to 50% flowering was observed early in GW273. Days to maturity was shown earlier maturity in CG1014. Number of tillers per plant was observed high in GW451. Highest spike length was observed high in CG1012. Number of seeds per spikelet was observed high in HI8750 and the highest yielder MACS6604 was found significantly superior over checks GW322, HI8498, HI1544, MPO1215, CG1304 and HD2932. All genotypes were highly significant for all characters. So that these genotypes can be exploited in further breeding programme.

KEY WORDS: Quantitative traits, wheat, germplasm, mean, range, mean sum of square, CV, SE.

INTRODUCTION

Wheat is most important cereal crop for the food security. As a staple food, it has got diversified domestic and industrial uses. Wheat provides nearly 55% of the carbohydrates and 20% of the food calories consumed globally (Breiman and Graur, 1995). It is the most important food crop of India and is a main source of protein and energy. It was the world's number one cereal crop after rice, feeding about 40 % of the world's population, grown under diverse agro-climatic conditions, contributing nearly one third of total food grain production (Kumar *et al.,* 2014). It can be grown not only in the tropical and subtropical zones but also in the temperate zone. It was used in the form of chapatti, bread, naan, tandoori, rumali, roti, puri, pudding, bhatore, bran and fodder *etc*. (Singh *et al.,* 2013). Quantitative traits in wheat include days to 50 % flowering, days to maturity, number of tillers per plant, spike length (cm), number of spikelets per spike, number of seeds per spikelet, number of seeds per spike, number of seeds per plant, 1000 seed weight (gm), seed yield per plant (gm), biological yield per plot, seed yield par plot and harvest index. Seed size was an important physical indicator of seed quality that affects vegetative growth and was frequently related to yield market grade factors and harvest efficient (Rukavina *et al.,* 2002). Wheat, a cereal grass of the *Poaceae* family and of the genus *Tritium*, is the world's largest grown cereal crop. It has been described as the 'King of cereals' because of the acreage it occupies, high productivity and the prominent position it holds in the international food grain trade. Globally, the total area under cultivation of wheat in 2013-14 was 227 million hectares, production of wheat recorded 654 million tonnes and productivity was recorded as 3 tonnes per hectare. The highest production recorded 125.6 million tonnes in China during 2013-14 and it ranks first in the world. India ranks second with a record production by 93.51 million tonnes (Anonymous, 2014 a). Major wheat producing countries of the world are China, India, United state of America, France, Russia, Canada, Germany, Turkey, Australia, Ukraine and Pakistan. India also has the larger area under wheat. About 90% of total wheat production was contributed by five states *viz*., Uttar Pradesh, Punjab, Haryana, Madhya Pradesh and Rajasthan. The other wheat producing states are Bihar, Gujarat, Jammu and Kashmir, Maharashtra, West Bengal and Chhattisgarh. The area, under wheat in India between 2000 to 2014 was increased from 25.73 to 30.00 million hectares where, production from 69.68 to 93.51 million tonnes and productivity from 27.08 to 31.71 quintals per hectares (Anonymous, 2014 b). In Chhattisgarh between the years 2000 to 2013-14, the total area under wheat was increased from 9.79 to 10.1 million hectares, production from 9.25 to 14.13 million tonnes. The evolution of the high yielding varieties along with improved production technology has made it possible to harvest 1057 Kg/ha in 2000 and 1396 Kg/ha during 2013-14 (Anonymous, 2014 a). The average growth rate in the production and yield per hectare during 2000-2014 is 3.7 and 3.9%, respectively.

Uttar Pradesh ranks first, production of wheat with record of 30.30 metric tonnes among the wheat growing states of the country followed by Punjab (16.11) and Madhya Pradesh (13.13) metric tonnes (Anonymous, 2013).

MATERIALS AND METHODS

The experimental materials for present investigation comprised twenty two genotypes *viz*., HD4730, HI8736, HD2932, MPO1215, HD4728, HI8498, MACS6604, MP3382, HI8750, HI8737, CG1304, GW451, CG1013, CG1014, CG1012, CG1301, CG1311, CG1314, CG1315, GW273, GW322 and HI1544 of wheat (*Triticum aestivum* L.). All the twenty two genotypes was grown in Randomized Block Design with three replication during *Rabi* 2013-14 at the Instructional cum Research Farm of College of Agriculture Raipur, Department of Genetics and Plant breeding, Indira Gandhi Krishi Vishwavidyalaya, Raipur. Each of three replications included 12 rows, 6 meter along and 20cm Apart. Wheat can be cultivated from sea level to as high as 3500 meter. Chhattisgarh is located in the east- central part of the country between 17°14" N and 24°45" N latitudes and 73°30" E and 84°15"E longitudes, whereas Raipur the capital of the Chhattisgarh state, lies at 21°16" N latitude and 81°36" E longitude with an altitude of 289.60 meters above sea level. The average maximum and minimum temperature at Raipur ranges between 31.34^0C and 15.92^0C, respectively. The numbers of days were recorded from date of sowing when 50% plants of the population were in flowering. The numbers of days from the date of sowing to the physiological maturity were recorded for each entry. Number of tillers per plant was measured by all productive tillers bearing ear were counted for each randomly selected plant at physiological maturity. Spike length was measured at the maturity in cm by scale just prior to harvesting from neck of spike to the tip to the last spikelet of main spike and the mean was calculated. Number of well filled and dried spikelets per spike was counted from each plot and the mean was calculated. Numbers of well filled and dried seeds per spikelet were counted from each plot and the mean was calculated. Numbers of well filled and dried seeds per spike were counted from each plot and the mean was calculated. Numbers of well filled and dried seeds per plant were counted from each plot and the mean was calculated. The test weight of thousand undamaged grains was recorded in gram by weighing machine from each genotype at experiment. Total seed quantity per plant was weighed after sun drying. Dry plants including root per plot was recorded. Dry seed per plot was recorded. The ratio of seed yield per plot with the biological yield per plot was calculated and expressed as percentage. Meteorological observation was taken in Rabi 2013-14. Data were statistically analyzed and to distinguish the significant differences between two different means was estimated. Mean squares of analysis of variances were worked out to text the significance. The statistical analysis of the data on individual character was carried out on the mean values over three replications.

RESULTS AND DISCUSSION

Analysis of variance carried out for all the 14 characters has been presented in Table 1. Analysis of variance worked out for seed yield and its attributing traits along with characters, indicated that the mean sum of squares due to genotypes were highly significant for all the characters *viz*., days to 50% flowering, days to maturity, plant height (cm), number of tillers per plant, spike length (cm), number of spikelets per spike, number of seeds per spike, number of seeds per plant, 1000-seed weight (g), seed yield per plant (g), biological yield per plot (g), seed yield per plot (g), harvest index (%).

Mean performance

The grand mean across all AVT and MLT genotypes for quantitative traits were: 58.06 days, 100.54 days, 78.38cm, 4.14, 8.17cm, 15.84, 2.63, 41.25, 169.93, 43.19gm, 7.70gm, 12210.60, 4949.05 and 40.32 for days to 50 % flowering, days to maturity, plant height (cm), no. of tillers per plant, spike length (cm), no. of spikelets per spike, no. of seeds per spikelet, no. of seeds per spike, no. of seeds per plant, 1000 seed weight (gm), seed yield per plant (gm), biological yield per plot, seed yield per plot and harvest index, respectively. Similar mean for days to 50% flowering was reported by other workers (Kumar *et al.*, 2009; Verma *et al.*, 2013; Kumar *et al.*, 2014). Similar mean for days to maturity was reported by other workers (Kumar *et al.*, 2009; Tahmasebi *et al.*, 2013; Verma *et al.*, 2013; Tesfaye *et al.*, 2014). Similar mean for plant height (cm) was reported by other workers (Aycicek *et al.*, 2006; Ali *et al.*, 2008; Tahmasebi *et al.*, 2013; Tesfaye *et al.*, 2014). Similar mean for no. of tillers per plant was reported by other workers (Ali *et al.*, 2008; Kumar *et al.*, 2009; Verma *et al.*, 2013). Similar mean for spike length (cm) was reported by other workers (Ali *et al.*, 2008; Dangusta *et al.*, 2008; Kumar *et al.*, 2009; Yao *et al.*, 2011; Kumar *et al.*, 2013; Tahmasebi *et al.*, 2013; Verma *et al.*, 2013; Kumar *et al.*, 2014). Similar mean for no. of spikelets per spike was reported by other workers (Ali *et al.*, 2008). Similar mean for no. of seeds per spike was reported by other workers (Ali *et al.*, 2008; Kumar *et al.*, 2009; Tahmasebi *et al.*, 2013; Verma *et al.*, 2013). Similar mean for seed yield per plant (gm) was reported by other workers (Ali *et al*., 2008; Kumar *et al*., 2009; Verma *et al*., 2013). Similar mean for 1000 seed weight (gm) was reported by other workers (Mohammad *et al.*, 2005; Aycicek *et al.*, 2006; Ali *et al.*, 2008; Kumar *et al.*, 2009; Verma *et al.*, 2013). Similar mean for harvest index was reported by other worker (Verma *et al.*, 2013).

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TABLE 1: Mean square of analysis of variance of fourteen quantitative traits of twenty two wheat genotypes

Source of variation	D.F.	Days to 50 % flowering	Dd Days to maturity	Plant height (cm)	No. of tiller per plant	Spike length (cm)	N No. of spikelet per spike	No. of seeds per spikelet	No. of seeds per spike	No. of seeds per plant	1000 seed weight (g)	Seed yield per plant (g)	Biological yield per plot (g)	Seed yield per plot (g)	Harvest index (%)
Replication	2	0.19	1.28	123.25	0.46	5.29	0.24	0.14	15.28	1050.25	0.31	0.55	7516672.0	1417088.0	32.10
Treatment	21	101.13**	79.73**	398.01**	1.86*	4.35**	5.48**	0.10	42.91**	4192.24**	68.16**	2.28*	11378558.00**	40158335.0**	66.09**
Error	42	0.27	1.03	26.91	0.57	0.40	1.87	4.31	8.92	350.62	0.79	0.63	1662358.00	435115.0	35.60

TABLE 2: Mean, range, standard error of mean and coefficient of variation for quantitative traits evaluated in different genotypes of wheat in three replication

Characters	Mean	Range		SE of mean	CV
		Minimum	Maximum		
Days to 50 % flowering	58.060	47.670	70.000	0.42	0.90
Days to maturity	100.54	94.670	114.00	0.83	1.01
Plant height (cm)	78.380	63.930	96.730	0.42	6.61
No. of tillers per plant	4.1400	2.9300	5.6000	0.61	18.32
Spike length (cm)	8.1700	5.9300	9.5700	0.52	7.83
No. of spikelets per spike	15.840	13.670	18.330	0.11	8.64
No. of seeds per spikelet	2.6300	2.2000	3.0000	0.16	7.88
No. of seeds per spike	41.250	34.000	48.330	0.24	7.24
No. of seeds per plant	169.93	117.00	238.67	0.15	11.01
1000 seed weight (g)	43.190	36.680	52.120	0.72	2.06
Seed yield per plant (g)	7.7000	5.4500	9.1700	0.64	10.31
Biological yield per plot (g)	12210.6	9166.67	15333.33	0.10	10.55
Seed yield per plot (g)	4949.05	3033.33	6700.00	0.53	13.32
Harvest index (%)	40.320	29.330	49.270	0.48	14.79

TABLE 3: Character wise top ranking genotypes for important traits on the basis of mean performance in wheat

S.N.	Characters/Genotypes	1	2	3	4	5
1	Days to 50% flowering	GW273(60.0)	CG1315(61.3)	CG1311(66.0)	CG1304 (68.0)	CG1301 (70.0)
2	Days to maturity	CG1014 (105.33)	CG1315 (105.67)	GW273 and CG1304 (106.33)	CG1311(107.33)	CG1301(114.00)
3	Plant height (cm)	CG1301 (90.46)	CG1314 (92.13)	CG1315 (92.46)	CG1311 (96.60)	CG1012 (98.53)
4	No. of tiller per plant	GW451and CG1311 (5.6)	GW273 (5.5)	CG1314 (5.0)	CG1013 and CG1012 (4.7)	CG1014 (4.6)
5	Spike length (cm)	CG1012 (9.57)	CG1314 (9.55)	CG1301 (9.53)	CG1315 (9.37)	CG1311 (9.15)
6	No. of spikelets per spike	CG1301 (18.53)	CG1314 (18.07)	CG1315 (17.73)	MP3382 and HD4730 (17.00)	HD4728 (16.87)
7	No. of seeds per Spikelet	HI8750 (3.00)	MP3382 and CG1013 (2.93)	CG1012 (2.80)	HD2932, MACS6604, CG1314 and CG1315 (2.73)	CG1311 (2.66)
8	No. of seeds per spike	MACS6604 (48.0)	GW273 (47.13)	CG1013 (46.60)	HD2932 (46.33)	CG1315 (45.00)
9	No. of seeds per plant	GW451 (611.00)	MACS6604 (238.67)	HD2932 (232.33)	HD4728 (226.00)	HI8750 (218.00)
10	1000-seed weight (g)	HI8736 (52.12)	GW322 (50.68)	HI8498 (50.14	HI8737 (49.50)	MPO1215 (49.25)
11	Seed yield per plant (g)	MACS6604 (48.00)	GW273 (47.13)	CG1013 (46.60)	HD2932 (46.33)	CG1315 (45.00)
12	Biological yield per plot (g)	HI8736 (15000)	CG1304 (14750)	HD4728 (14500)	GW451 and HD2932 (14175)	MACS6604 (13750)
13	Seed yield per plot (g)	MACS6604 (6750) (46.87q/ha)	HD2932 (6537.5) (45.39q/ha)	HI8750 (6400) (44.44q/ha)	HD4728 (6287.5) (43.66q/ha)	GW451 (5937.5) (41.23q/ha)
14	Harvest index (%)	HI8750 (47.25)	MACS6604 (44.80)	HD4728 (44.57)	HD2932 (44.22)	HD4730 (43.70)

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TABLE 4: Meteorological observed data of Raipur during the crop season *Rabi* 2013-2014

Week No.	Month & year	Date	Temp (°C)		Rainfall (mm)	Relative humidity (%)		Vapour pressure (mm of Hg)		Wind velociy (kmph)	Evaporation (mm)	Sun shine (Hrs)
			Max	Min		I	II	I	II			
47	November,	19-25	30.3	16.7	0.0	87	40	13	12.4	1.5	3.2	7.3
48	2013	26-02	30.0	15.6	0.0	83	35	12	10.8	1.6	3.5	8.4
49	December,	03-09	28.1	11.8	0.0	91	31	10.4	8.3	1.3	3.1	8.5
50	2013	10-16	27.7	9.8	0.0	90	27	8.9	7.3	1.3	3.0	9
51		17-23	28.1	11.7	0.0	90	34	10.1	9.2	1.6	2.6	8
52		24-31	28.3	12.7	0.0	93	40	10.8	10.9	0.9	2.6	6.5
1	January,	01-07	28.6	13.6	0.0	90	40	11.1	11	0.7	2.6	6.9
2	2014	08-14	27.8	14.1	0.0	90	47	11.5	12.5	1.6	2.5	5.4
3		15-21	29.0	16.1	0.0	89	46	13	13	2.5	2.8	4.6
4		22-28	28.2	13.7	0.0	87	38	11	10	2.3	3.5	7
5		29-04	28.8	10.1	0.0	86	28	8.5	7.9	2	3.7	9.5
6	February,	05-11	31.7	14.8	0.0	85	33	11.3	10.8	3.2	4.3	8.7
7	2014	12-18	27.9	15.4	20.4	83	39	11.8	9.9	4.1	4.3	6.6
8		19-25	28.9	14.6	18.6	86	41	11.7	12	2.9	4.1	8.7
9		26-04	27.9	17.7	45.8	91	61	14.5	14.4	4.1	4.1	6.6
10	March,	05-11	27.5	17.5	2.4	88	44	14.5	12.3	2.7	2.9	4.9
11	2014	12-18	33.3	19.5	2	89	38	16.5	14.3	1.4	4.6	7.5
12		19-25	36.4	19.4	0.0	74	21	14.4	09.1	02.7	6.9	9.0
13		26-01	38.4	22.2	0.0	67	24	15.5	11.8	03.1	7.0	7.7
14	April,	02-08	39.5	22.0	0.0	59	17	13.4	8.9	3.5	8.5	8.6
15	2014	09-15	38.5	22.4	2.8	58	23	14.0	11.4	5.1	8.4	6.8
16		16-22	37.8	23.4	18.0	67	28	16.6	13.1	5.1	8.2	9.1
17		23-29	41.1	25.1	0.2	58	18	16.1	10.1	4.5	9.5	9.7
18		30-06	40.1	25.6	2.4	53	23	15.5	11.9	8.7	11.3	9.4
Mean			31.82	16.89	12.51	80.58	34	12.75	10.97	2.85	4.88	7.68

TABLE 5: Mean performance of seed yield & its components in wheat during Rabi 2013- 14.

Genotypes	Days to 50% flowering	Days to maturity	Plant height (cm)	No. of tillers per plant	Spike length (cm)	No. of spikelets per spike	No. of seeds per spikelet	No. of seeds per spike	No. of seeds per plant	1000 seed weight (g)	Seed yield per plant (g)	Biological yield per plot (g)	Seed yield per plot (g)	Harvest index (%)
HD 4730	60.30	102.67	68.00	3.33	6.18	17.00	2.53	40.40	158.33	43.43	40.40	13625	5887.50	43.70
HI 8736	59.30	100.00	67.46	4.20	6.33	15.20	2.53	38.60	167.66	52.11	38.60	13750	5887.50	43.00
HD2932	50.00	97.67	75.23	4.40	9.56	13.80	2.73	46.33	232.33	41.42	46.33	14750	6537.50	44.22
MPO 1215	59.00	95.33	64.00	2.93	5.93	15.80	2.40	38.66	98.00	49.25	38.66	10625	4700.00	43.90
HD 4728	58.30	101.33	71.03	3.00	7.06	16.86	2.66	44.00	226.00	47.25	44.00	14500	6287.50	44.57
HI 8498	56.00	100.00	70.56	3.60	7.36	14.93	2.53	36.46	128.46	50.14	36.46	12800	5300.00	41.54
MACS6604	47.70	98.00	78.53	3.86	9.16	15.46	2.73	48.00	238.66	39.53	48.00	15000	6750.00	44.80
MP 3382	49.30	94.67	72.13	3.73	8.15	17.00	2.93	41.93	173.33	42.10	41.93	12750	5262.50	40.25
HI 8750	56.00	95.33	64.46	4.00	7.20	15.86	3.00	44.00	218.00	47.91	44.00	13500	6400.00	47.25
HI 8737	56.30	95.00	63.93	3.20	6.64	14.66	2.60	39.80	193.33	49.49	39.80	13375	5866.67	42.85
CG1304	68.00	106.33	70.26	3.80	7.65	14.66	2.46	39.00	141.33	39.55	39.00	14175	4462.50	42.20
GW451	56.30	96.33	65.10	5.60	8.67	13.93	2.60	33.00	611.00	40.09	33.00	14750	5937.50	40.33
CG1013	59.30	58.33	83.73	4.66	8.93	16.73	2.93	46.60	175.06	37.30	46.60	11000	3575.00	32.10
CG1014	59.30	105.33	83.00	4.60	8.15	16.26	2.46	40.00	156.33	40.09	40.00	10167	3900.00	39.20
CG1012	48.00	95.00	98.53	4.70	9.57	16.30	2.80	38.33	130.00	40.32	38.33	10500	3033.00	29.30
CG1301	70.00	114.00	90.46	3.50	9.53	18.53	2.20	37.86	109.40	39.89	37.86	9167	3550.00	40.40
CG1311	66.00	107.33	96.60	5.60	9.15	13.73	2.66	38.33	139.20	36.67	38.33	11667	3750.00	32.20
CG1314	59.30	102.33	92.13	5.00	9.55	18.06	2.73	40.66	141.33	39.48	40.66	10500	3975.00	37.70
CG1315	61.30	105.67	92.46	4.53	9.37	17.73	2.73	45.00	122.66	43.03	45.00	11000	3892.00	35.40
GW273	60.00	106.33	78.20	5.50	9.06	16.66	2.46	47.13	208.00	40.03	47.13	9833	4258.00	41.70
GW322	61.00	96.33	87.10	3.80	8.01	14.53	2.66	34.10	127.33	50.68	34.10	10333	4025.00	41.50
HI1544	56.30	91. b00	89.80	3.90	8.50	15.33	2.53	37.47	144.66	40.44	37.47	10333	4250.00	41.60

Range performance

The ranges of mean for quantitative traits estimates across environments for these traits ranged from 47.67 to 70.00 days, 94.67 to 114.00 days, 63.93 to 98.27 cm, 2.93 to 5.60, 5.93 to 9.57 cm, 13.67 to 18.33, 2.20 to 3.00, 34.00 to 48.33, 117.00 to 238.67, 36.68 to 52.12 gm, 5.45 to 9.17 gm, 9166.67 to 1533.33, 3033.33 to 67.00 and 29.33 to 49.27 for days to 50 % flowering, days to maturity, plant height (cm), no. of tillers per plant, spike length (cm), no. of spikelets per spike, no. of seeds per spikelet, no. of seeds per spike, no. of seeds per plant, 1000 seed weight (gm), seed yield per plant (gm), biological yield per plot, seed yield per plot and harvest index, respectively. Similar range for days to 50 % flowering was reported by other worker (Kumar *et al.,* 2009; Verma *et al.,* 2013). Similar range for days to maturity was reported by other worker (Kumar *et al.,* 2009; Verma *et al.,* 2013). Similar range for plant height (cm) was reported by other worker (Aycicek *et al.,* 2006; Ali *et al.,* 2008; Kumar *et al.,* 2009; Verma *et al.,* 2013). The range for no. of tillers per plant agrees with the reports of Hanssan *et al.* (2004), Ali *et al.* (2008), Kumar *et al.* (2009), Karim *et al.* (2013) and Verma *et al.,* (2013). Similar range for spike length (cm) was reported by other workers (Hanssan *et al.,* 2004; Ali *et al.,* 2008; Kumar *et al.,* 2009; Verma *et al.,* 2013). The range for no. of spikelets per spike agrees with the reports of Hanssan *et al.* (2004), Ali *et al.* (2008) and Karim *et al.* (2013). Similar range for no. of seeds per spike was reported by other workers Hanssan *et al.,* 2004; Ali *et al.,* 2008; Kumar *et al.,* 2009; Verma *et al.,* 2013. The range for 1000 seed weight (gm) agrees with the reports of Hanssan *et al.* (2004), Aycicek *et al.,* 2006, Ali *et al.,* 2008, Kumar *et al.,* 2009, Verma *et al.,* 2013. Similar range for seed yield per plant (gm) was reported by other workers.

Character wise top ranking genotypes for important traits on the basis of mean performance

The highest yielder MACS6604 was found significantly superior over checks GW322, HI8498, HI1544, MPO1215, CG1304 and HD2932 however, it was found at par with best check GW273. Similarly, CG1013 was found superior over checks GW322, HI8498, HI1544, MPO1215 and CG1304, however, it was found at par with checks HD2932 and GW273. Genotype CG1315 was found superior over checks GW322, HI8498, HI1544, MPO1215 and CG1304, however, it was found at par with checks HD2932 and GW273. Days to 50 % flowering was observed early in GW273 followed by CG1315, CG1311, CG1304 and CG1301. Days to maturity was shown earlier maturity in CG1014 followed by CG1315, GW273, CG1304, CG1311 and CG1301. Plant height was exhibited lowest in CG1301 followed by CG1314, CG1315, CG1311 and CG1012. Number of tillers per plant was observed high in GW451, CG1311, GW273, CG1314, CG1013, CG1012 and CG1014. Highest spike length was observed high in CG1012 followed by CG1314, CG1301, CG1315 and CG1311.Number of spikelets per spike was observed high in CG1301 followed by CG1314, CG1315, MP3382, HD4730 and HD4728. Number of seeds per spikelet was observed high in HI8750 followed by MP3382, CG1013, CG1012, HD2932, MACS6604, CG1314, CG1315 and CG1311. Number of seeds per spike was observed higher in MACS6604 followed by GW273, CG1013, HD2932 and CG1315. Number of seeds per plant was observed higher in GW451 followed by MACS6604, HD2932, HD4728 and HI8750. Test weight was showed higher in HI8736 followed by GW322, HI8498, HI8737 and MPO1215. MACS6604 recorded highest seed yield per plant followed by GW273, CG1013, HD2932, and CG1315. Highest harvest index was exhibited by HI8750 followed by MACS6604, HD4728, HD2932 and HD4730.

CONCLUSION

Days to 50 % flowering was observed early in GW273. Days to maturity was shown earlier maturity in CG1014. Number of tillers per plant was observed high in GW451. Highest spike length was observed high in CG1012. Number of seeds per spikelet was observed high in HI8750 and the highest yielder MACS6604 was found significantly superior over checks GW322, HI8498, HI1544, MPO1215, CG1304 and HD2932. Based on results of means, it is suggested that the genotypes with yield contributing traits may be utilized to improve the seed yield per plant (g) of wheat genotype through hybridization and selection.

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