

# **The impact of differences planting date against morphological characters of some wheat genotype in Berastagi of Karo District**

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**Abstract.** Optimal planting date is one of the important factors affecting the wheat crop. Improper planting date can lead to a drastic decrease in wheat yield. Therefore, information about the adaptation of wheat plants at planting date at a particular location will benefit farmers in determining how best to utilize the wheat plants in each production system through morphological characters. Then conducted research The Impact of Differences Planting date against Morphology Character of some Wheat Genotypes in Berastagi of Karo district to determine the most appropriate wheat genotypes grown in Berastagi at certain times growing season through morphological characters. This research was conducted at Berastagi with two planting date (planting date I = late February to early June 2012 and planting date II = late October 2012 to early February 2013), using a Randomized Block Design (RBD) non factorial using 12 wheat plant, namely 2 varieties (Selayar / K and Dewata / L) and 10 genotypes that OASIS / SKAUZ / / 4 \* BCN (A); HP1744 (B); LAJ3302 / 2 \* MO88 (C); RABE / 2 \* MO88 (D), H-21 (E), G-21 (F), G-18 (G); MENEMEN (H); BASRIBEY (I); ALIBEY (J). Observational data were tested with analysis of variance and combined analysis. The observed morphological characters were plant height, number of spikelet spike<sup>-1</sup>, number of grainspike<sup>-1</sup> and grain weight spike<sup>-1</sup>. The results of analysis of variance and combined analysis showed that all parameters were observed give significantly different results for each planting date.

**Keywords:** planting date, morphological characters, wheat genotypes

## **Introduction**

Climate parameters that affect the grain crop is rainfall, sunlight, while irradiation, relative humidity, and temperature. Of differences in climatic elements from season to season or even from time to time will affect crop yield potential of wheat. Rainfall direct and indirect effect on wheat yield. The direct effect is through the availability of water for crops of wheat and planting period, while the indirect effect is through the humidity, temperature, and light intensity (Las et al., 2008).

Runtunuwu (2006) and Syahbuddin (2007) states that the direct impact of changes in rainfall patterns is the change in the planting period. Shifts and changes in rainfall patterns and seasons, also disrupt the season and cropping patterns and planting and harvesting area. Planting date is a critical component of successful wheat production. Planting too early or too late reduces yield potential. Planting at inappropriate time may cause drastic reduction in wheat yield, any delay in sowing reduced tillers, seed index and grain yield that resulted in reduced yield.

## Materials and Methods

The research was conducted in the highlands of Berastagi (1400 m above sea level) with two planting date (planting date I = late February to early June 2012 and planting date II = late October 2012 to early February 2013). Wheat seeds that is used comes from Cereal Crops Research Center of Maros in South Sulawesi as much as twelve types namely two varieties of comparison (Selayar / K and Dewata / L), while ten types of wheat are still shaped genotypes namely: OASIS/SKAUZ//4\*BCN **(A)**; HP1744 **(B)**; LAJ3302/2\*MO88 **(C)**; RABE/2\*MO88 **(D)**; H-21 **(E)**; G-21 **(F)**; G-18 **(G)**; MENEMEN **(H)**; BASRIBEY **(I)**; ALIBEY **(J)**. Twelve kinds of wheat planting repeated three times for each planting date by using array's system where the distance between the array's 25 cm. The study was conducted using a single factor, namely 12 genotypes of wheat, while fertilizer as recommended Cereal Crops Research Center of Maros, South Sulawesi. This study using Randomized Block Design (RBD) non factorial for each planting date and analysis of the combined data for two planting date. If the results of the study showed significant differences, it will be followed by Duncan's Multiple Range Test with a level of 5%. Morphological characters of wheat plants observed were plant height, number of spikelet panicle<sup>-1</sup>, number of grain panicle<sup>-1</sup> and grain weight panicle<sup>-1</sup>.

## Results and Discussion

In both planting date, significant differences in all parameters due to planting dates were observed (Table 1, 2, 3 and 4).

### Plant Height

Plant height at planting date-I was very good (Dewata/L = 105.37 cm), but a decreasing trend was observed in late planted wheat at planting date-II (Dewata/L = 89.27 cm). These results are in agreement with the findings of Khokharet *al.* (2010) who observed that late planted wheat showed a trend of decrease in plant height, tillers plant<sup>-1</sup>, spike length.

Table 1. Average Plant Height (cm) of Wheat at Planting Date-I, Planting Date-II and Combined

Genotype	Planting date-I	Planting date-II	Combined
A	84.68 <sup>g</sup>	65.04 <sup>i</sup>	74.86 <sup>i</sup>
B	81.24 <sup>i</sup>	64.51 <sup>k</sup>	72.88 <sup>k</sup>
C	112.70 <sup>a</sup>	87.73 <sup>b</sup>	100.22 <sup>a</sup>
D	88.47 <sup>e</sup>	72.11 <sup>f</sup>	80.29 <sup>f</sup>
E	104.37 <sup>c</sup>	77.41 <sup>d</sup>	90.89 <sup>c</sup>
F	84.29 <sup>h</sup>	83.82 <sup>c</sup>	84.06 <sup>e</sup>
G	102.35 <sup>d</sup>	73.22 <sup>e</sup>	87.78 <sup>d</sup>

H	80.87 <sup>j</sup>	64.89 <sup>j</sup>	72.88 <sup>k</sup>
I	85.77 <sup>f</sup>	65.07 <sup>i</sup>	75.42 <sup>h</sup>
J	88.42 <sup>e</sup>	70.32 <sup>g</sup>	79.37 <sup>g</sup>
K	88.47 <sup>e</sup>	65.65 <sup>h</sup>	74.56 <sup>j</sup>
L	105.37 <sup>b</sup>	89.27 <sup>a</sup>	97.32 <sup>b</sup>

testing performed by Duncan's Multiple Range Test at the 5% level

Below is The Relation of Wheat Genotypes with Plant Height in (Figure 1.)

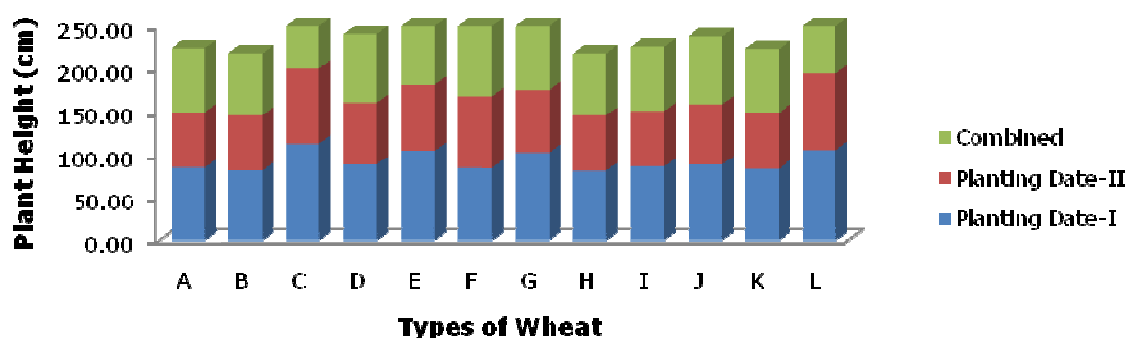


Figure 1. The Relation of Wheat Genotypes with Plant Height (cm) in Berastagi at Planting Date-I, Planting Date-II and Combined

### **Number of Spikelet Spike<sup>-1</sup>**

Parameter number of spikelet spike<sup>-1</sup> at planting date-II is better than planting date-I. While all types of wheat were significantly different for each planting date. At planting date-I, the best kind of wheat is Dewata/L (23.45) and planting date-II is Dewata/L (23.19). These findings are in agreement with those of Nazir and Ullah (2004) who also reported that proper planting date is an important factor for crop production of wheat. Different planting dates affect seed development, quality and yield of wheat. Delay in planting affects crop performance in the field and ultimately produces low yield. Delay in planting normally reduces individual plant growth and tiller production.

Table2. Average Number of Spikelet Spike<sup>-1</sup> of Wheat at Planting Date-I, Planting Date-II and Combined

Genotype	Planting date-I	Planting date-II	Combined
A	16.77 <sup>h</sup>	21.02 <sup>c</sup>	18.90 <sup>d</sup>
B	16.64 <sup>i</sup>	19.19 <sup>e</sup>	17.91 <sup>i</sup>
C	17.73 <sup>e</sup>	18.79 <sup>h</sup>	18.26 <sup>g</sup>
D	16.29 <sup>k</sup>	18.27 <sup>j</sup>	17.28 <sup>k</sup>
E	19.43 <sup>c</sup>	19.19 <sup>e</sup>	19.31 <sup>c</sup>
F	16.54 <sup>j</sup>	18.51 <sup>i</sup>	17.53 <sup>j</sup>
G	19.85 <sup>b</sup>	21.41 <sup>b</sup>	20.63 <sup>b</sup>
H	18.54 <sup>d</sup>	18.82 <sup>h</sup>	18.68 <sup>e</sup>
I	17.61 <sup>f</sup>	19.42 <sup>d</sup>	18.52 <sup>f</sup>
J	16.13 <sup>l</sup>	18.91 <sup>g</sup>	17.52 <sup>j</sup>
K	17.20 <sup>g</sup>	19.05 <sup>f</sup>	18.13 <sup>h</sup>
L	23.45 <sup>a</sup>	23.19 <sup>a</sup>	23.32 <sup>a</sup>

testingperformedbyDuncan'sMultipleRange Testat the5% level

Below is The Relation of Wheat Genotypes with Number of Spikelet Spike<sup>-1</sup> (Figure 2.)

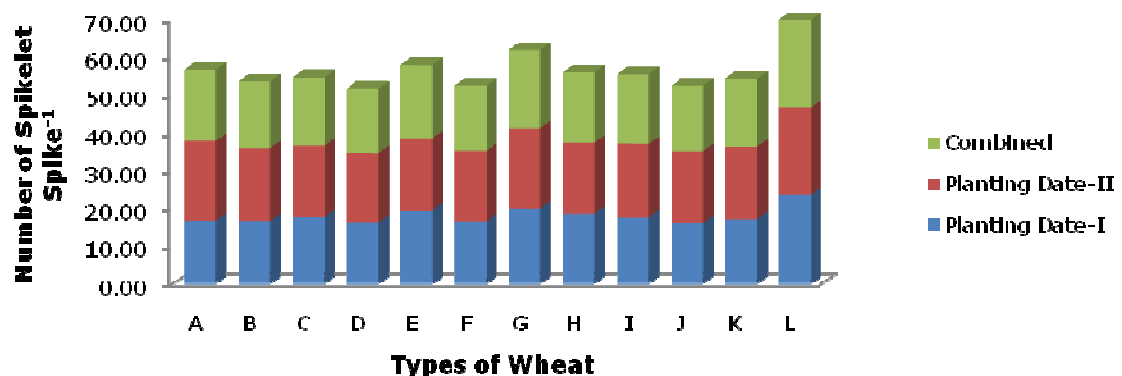


Figure 2.The Relation of Wheat Genotypes with Number of Spikelet Spike<sup>-1</sup> in Berastagi at Planting Date-I, Planting Date-II and Combined

### **Number of Grain Spike<sup>-1</sup>**

Parameter number of grain spike<sup>-1</sup> at planting date-I is better than planting date-II. While all types of wheat were significantly different for each planting date. At planting date-I, the best kind of wheat is Dewata/L (60.26) and planting date-II is Selayar/K (51.72). These findings are supported by those of Said *et al.* (2012), who reported planting dates had significant effect on number of grain spike<sup>-1</sup>. The possible reasons could be due to suitable temperature during seed development and more number of branches plant<sup>-1</sup> with more productive spikes, and thus resulted in greater number of grain spike<sup>-1</sup>.

Table 3. Average Number of Grain Spike<sup>-1</sup> of Wheat at Planting Date-I, Planting Date-II and Combined

Genotype	Planting date-I	Planting date-II	Combined
A	44.78 <sup>k</sup>	49.67 <sup>c</sup>	47.22 <sup>e</sup>
B	40.12 <sup>l</sup>	48.32 <sup>d</sup>	44.22 <sup>j</sup>
C	53.59 <sup>e</sup>	45.59 <sup>f</sup>	49.59 <sup>b</sup>
D	50.27 <sup>g</sup>	32.19 <sup>l</sup>	41.23 <sup>l</sup>
E	53.08 <sup>f</sup>	39.26 <sup>h</sup>	46.17 <sup>h</sup>
F	57.19 <sup>b</sup>	35.53 <sup>j</sup>	46.36 <sup>g</sup>
G	55.33 <sup>c</sup>	35.40 <sup>k</sup>	45.37 <sup>i</sup>
H	53.86 <sup>d</sup>	41.60 <sup>g</sup>	47.73 <sup>d</sup>
I	47.71 <sup>h</sup>	46.27 <sup>e</sup>	46.99 <sup>f</sup>
J	45.40 <sup>j</sup>	38.88 <sup>i</sup>	42.14 <sup>k</sup>
K	47.21 <sup>i</sup>	51.72 <sup>a</sup>	49.47 <sup>c</sup>
L	60.26 <sup>a</sup>	50.66 <sup>b</sup>	55.46 <sup>a</sup>

testing performed by Duncan's Multiple Range Test at the 5% level

Below is The Relation of Wheat Genotypes with Number of Grain Spike<sup>-1</sup> (Figure 3.)

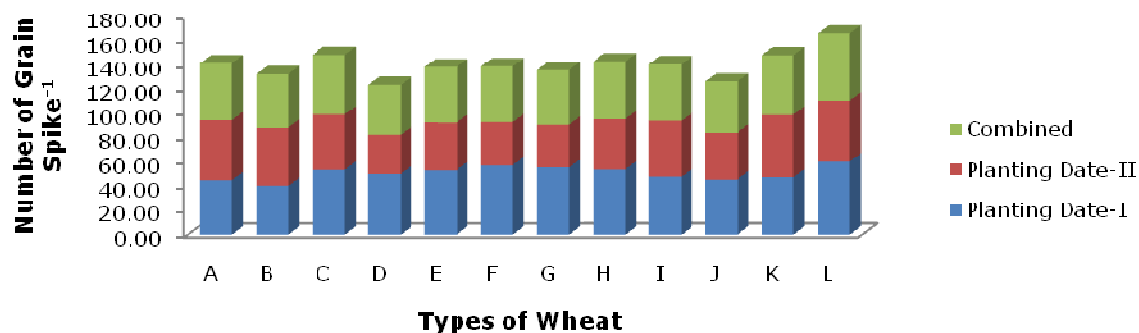


Figure 3. The Relation of Wheat Genotypes with Number of Grain Spike<sup>-1</sup> in Berastagi at Planting Date-I, Planting Date-II and Combined

#### **Grain Weight Spike<sup>-1</sup>**

Parameter grain weight spike<sup>-1</sup> at planting date-I is better than planting date-II. While all types of wheat were significantly different for each planting date. At planting date-I, the best kind of wheat is Dewata/L (2.60 g) and planting date-II is Selayar/K (1.73 g). These findings are supported by those of Said *et al.* (2012), who reported planting dates had significant effect on grain weight. The reasons may be genetic make-up of the genotypes or less/more competition for plant nutrients which produced weak/healthy plants and turn into healthier and plump seed formation.

Table 4. Average Grain Weight Spike<sup>-1</sup> of Wheat (g) at Planting Date-I, Planting Date-II and Combined

Genotype	Planting date-I	Planting date-II	Combined
A	1.93 <sup>j</sup>	1.71 <sup>b</sup>	1.82 <sup>c</sup>
B	1.69 <sup>l</sup>	1.63 <sup>d</sup>	1.66 <sup>f</sup>
C	2.14 <sup>g</sup>	1.39 <sup>e</sup>	1.76 <sup>d</sup>
D	2.16 <sup>f</sup>	1.07 <sup>j</sup>	1.61 <sup>g</sup>
E	2.29 <sup>d</sup>	1.23 <sup>g</sup>	1.76 <sup>d</sup>
F	2.35 <sup>b</sup>	1.17 <sup>h</sup>	1.76 <sup>d</sup>
G	2.32 <sup>c</sup>	1.16 <sup>i</sup>	1.74 <sup>e</sup>
H	2.20 <sup>e</sup>	1.29 <sup>f</sup>	1.75 <sup>de</sup>
I	2.09 <sup>h</sup>	1.62 <sup>d</sup>	1.86 <sup>b</sup>

J	2.04 <sup>i</sup>	1.29 <sup>f</sup>	1.66 <sup>f</sup>
K	1.88 <sup>k</sup>	1.73 <sup>a</sup>	1.81 <sup>c</sup>
L	2.60 <sup>a</sup>	1.67 <sup>c</sup>	2.14 <sup>a</sup>

testing performed by Duncan's Multiple Range Test at the 5% level

Below is The Relation of Wheat Genotypes with Grain Weight Spike<sup>-1</sup> (Figure 4.)

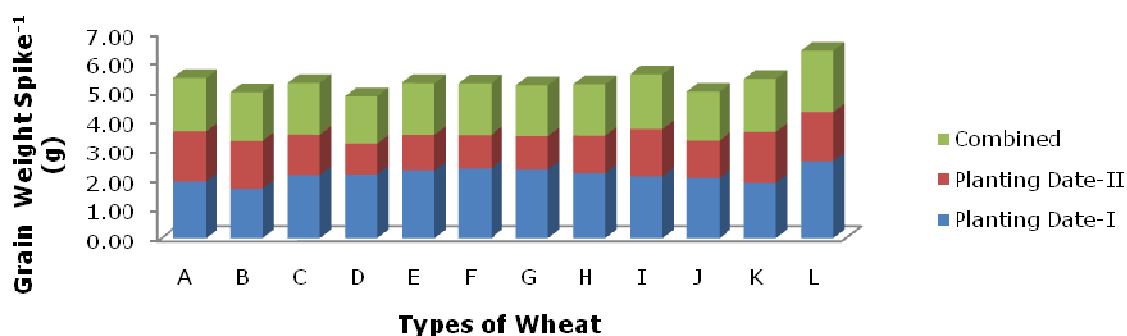


Figure 4. The Relation of Wheat Genotypes with Grain Weight Spike<sup>-1</sup> in Berastagi at Planting Date-I, Planting Date-II and Combined

### Conclusions

Results showed that the parameters of plant height, number of grain spike<sup>-1</sup> and grain weight spike<sup>-1</sup> had better results at planting date-I, while the number of spikelets spike<sup>-1</sup> showed better results at planting date-II. Therefore, planting date-I can be recommended to get a higher wheat yield in agro-climatic conditions of Berastagi.

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