



# EFFECT OF SOWING DATES ON GROWTH, YIELD ATTRIBUTES AND YIELD OF FOUR WHEAT VARIETIES

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## ABSTRACT

A field experiment entitled “Effect of sowing dates on growth, yield attributes and yield of four wheat varieties” was conducted during winter season of 2016-17 on sandy loam soils of Poz-e-Ishan Research Farm of Agricultural Faculty of Baghlan University. The experiment was laid out in split plot design viz. four dates of sowing comprised of (16<sup>th</sup> November, 01<sup>st</sup> December, 16<sup>th</sup> December and 31<sup>st</sup> December 2016) as main plot treatments and four varieties (Solh 02, Gul 09, Muqawim 09, Kabul 013) as sub plot treatments with four replications. The highest plant height, number of effective per plant, test weight and grain yield of wheat was recorded with all varieties sown on 16 Nov-16, which was statistically identical with all treatments sown on 01 Dec-16 but significantly higher over rest of date of sowing. Among wheat varieties Kabul 013 and Gul 09 produced significantly higher plant height, number of effective per plant, test weight and grain yield of wheat over rest of the varieties.

**KEY-WORDS:** Date of sowing, wheat varieties, growth and yield

## 1. INTRODUCTION

Wheat (*Triticum aestivum* L.) being world first ranked grain crop is the mainstay of the agricultural economy and also known as ‘King of cereals’. And also wheat is the second most important staple food crop of the world after rice. Wheat is the staple crop, accounting for about 83% of total cereal consumption in Afghanistan (Mail, 2010). A large part of the Afghan wheat crop is grown in the Northern provinces with the majority of the crop being dependent on seasonal precipitation. The 5-year average wheat grain yield production is 4.26 million tons. Harvested area is estimated at 2.55 million hectares (Geerts and Raes 2009, FAO 2002). Wheat, being a winter cereal, requires particular environmental conditions for better growth and yield (Dabre *et al.*, 1993) and is more venerable if exposed to high temperatures during reproductive stages (Kalra *et al.*, 2008). Too early

sowing produces weak plants with poor root system, which leads to irregular germination, frequent death of the embryo and decomposition of endosperm due to activities of bacteria or fungi (Paul, 1992). While, late planting affects germination, growth, grain development (Haq & Khan, 2002) and produces poor tillering due to winter injury in low temperature (Tahir *et al.*, 2009).

Timely sowing of wheat provides optimum growing period for the crop growth which can accumulate more biomass and finally results in higher grain and biological yield. Therefore by keeping the above facts in consideration, this investigation was taken during winter season of 2016-17 to find out the effect of sowing dates on growth, yield attributes and yield of wheat.



## 2. OBJECTIVE

To study the Effect of sowing dates on growth yield attributes and yield of four wheat varieties.

## 3. METHODOLOGY

The field experiment was conducted during winter season of 2016-17 on sandy loam soil with pH of 6.5 and organic matter 0.8% at Poz-e-Ishan Research Farm of Agricultural Faculty of Baghlan University in Afghanistan, to study effect of sowing dates on growth, yield attributes and yield of four wheat varieties. The experiment was laid out in split plot design viz. four dates of sowing comprised of (16<sup>th</sup> November, 01<sup>st</sup> December, 16<sup>th</sup> December and 31<sup>st</sup> December 2016) as main plot treatments and four varieties (Solh 02, Gul 09, Muqawim 09, Kabul 013) as sub plot treatments with four replications. All operations were performed as per crop recommendation. The row spacing was maintained 20 cm ×10 cm. The data on growth, yield attributes and yield of all varieties were recorded from different treatments.

## 4. RESULTS AND DISCUSSION

### 4.1 Effect on growth

The plant height of wheat was significantly higher with Kabul 013 and Gul 09 varieties over rest of the varieties. The date of sowing also affected the plant height of wheat; the plant height of wheat was higher with all varieties sown on 16-Nov-16 and were identical with all the varieties sown on 01-Dec-16 but significantly higher over the varieties sown in rest of

date of sowing. These findings are in line with Madhu et al. (2018), who observed the highest plant height of wheat was measured with all the varieties sown on 15 November and the lowest plant height was found in 30 December. They also found significant differences among varieties in respect of plant height at harvest stages of the crop. Rout Satapathy (1994) observed higher plant height when wheat was sown on 21<sup>st</sup> November and 1<sup>st</sup> December than the preceding and succeeding dates of sowing.

### 4.2 Effect on yield

The number of fertile tillers is dependent on seeding rate and environmental conditions during tiller development. Among the varieties Kabul 013 produced highest number of effective tillers per plant, which was identical with Gul 09 and but significantly higher over rest of the varieties. All the varieties which were sown on 16-Nov-16 produced higher number of effective tillers per plant, which was identical with all varieties sown on 01-Dec-16, but significantly higher over rest of dates of sowing. This finding is with conformity with Rout Satapathy (1994) who recorded higher number of effective tillers when wheat was sown on 21<sup>st</sup> of November and 1<sup>st</sup> of December. Naik *et al.* (1991) reported that dates of sowing significantly influenced the plant height and yield attributes. The crop sown on 18<sup>th</sup> November produced significantly taller plants coupled with maximum number of effective tiller per plant.

**Table 1: Effect of wheat date of sowing and varieties on plant height (cm) at harvest**

Date of sowing	Varieties				Mean
	Solh 02	Gul 09	Muqawim 09	Kabul 013	
16-Nov-16	95.87	96.67	93.60	98.97	96.28
01-Dec-16	93.62	94.68	92.56	97.00	94.46
16-Dec-16	85.80	89.61	86.78	90.28	88.12
31-Dec-16	83.87	87.45	82.62	87.28	85.30
<b>Mean B</b>	89.79	92.10	88.89	93.38	
<b>Factors</b>		<b>CD at 5%</b>		<b>SEm ±</b>	
Date of sowing		2.48		0.76	
Varieties		2.86		0.99	
Varieties at same level of date of sowing		N/A		1.53	
Date of sowing at same level of varieties		N/A		1.88	

The highest test weight of wheat obtained with Kabul 013, where it was identical with Gul 09 but significantly higher over rest of the varieties. The date of sowing had also significant effect on test weight of wheat. All the varieties which were sown on 16-Nov-16 had higher but identical test weight with all varieties

sown on 01-Dec-16, but significantly higher test weight over varieties sown in rest of dates. These finding are in line with Mukherjee (2012) who concluded that, sowing at November 15, significantly influenced the test weight and entire yield attributing character and was



statistically at par with November 30 sowing, and significantly better to other dates of sowing.

The higher grain yield of wheat was obtained from Kabul 013 varieties, where it was statistically at with Gul 09 but significantly higher over rest of the varieties. Date of sowing had significant effect on grain yield of wheat. It was observed that all the varieties which were sown on 16-Nov-16 produced higher but identical grain yield with all the varieties sown on 01-Dec-16, but significantly higher grain yield of wheat over rest of the varieties sown in rest of dates of sowing. With delay in each dates of sowing the grain yield of wheat was reduced. The significantly higher yield of wheat with varieties sown on 16-Nov-16 and

01-Dec-16 wheat can be justified owing to favourable temperature requirement as per crop need boosting crop growth in the form of higher photosynthate accumulation and resulting higher yield parameters and final yield of wheat crop. These findings are in compare with Behera (1994), who reported that higher temperature during later part of the crop growth in delayed sowing caused forced maturity of the crop and resulted in lower test weight, less filled grains and ultimately the lower grain yield. Kumar *et al.* (1994) obtained highest mean yield with early sown wheat whereas, poorer grain and straw yield were obtained from the late sown wheat.

**Table 2: Effect of wheat date of sowing and varieties on number of effective tillers per plant at harvest**

Date of sowing	Varieties				Mean
	Soh 02	Gul 09	Muqawim 09	Kabul 013	
16-Nov-16	4.00	4.25	3.50	4.50	4.06
01-Dec-16	3.75	4.00	3.25	4.25	3.81
16-Dec-16	3.00	3.50	2.75	3.50	3.19
31-Dec-16	2.75	3.25	2.75	3.25	3.00
<b>Mean B</b>	3.38	3.75	3.06	3.88	
<b>Factors</b>	<b>CD at 5%</b>		<b>SEm ±</b>		
Date of sowing	0.45		0.14		
Varieties	0.46		0.16		
Varieties at same level of date of sowing	N/A		0.28		
Date of sowing at same level of varieties	N/A		0.31		

**Table 3: Effect of wheat date of sowing and varieties test weight (g)**

Date of sowing	Varieties				Mean
	Soh 02	Gul 09	Muqawim 09	Kabul 013	
16-Nov-16	35.85	37.31	35.29	36.69	36.28
01-Dec-16	35.66	36.83	33.61	36.86	35.74
16-Dec-16	34.83	35.65	33.46	36.90	35.21
31-Dec-16	32.95	33.59	32.20	34.74	33.37
<b>Mean B</b>	34.82	35.84	33.64	36.30	
<b>Factors</b>	<b>CD at 5%</b>		<b>SEm ±</b>		
Date of sowing	1.02		0.32		
Varieties	0.74		0.26		
Varieties at same level of date of sowing	N/A		0.63		
Date of sowing at same level of varieties	N/A		0.55		

**Table 4: Effect of wheat date of sowing and varieties on grain yield (kg/ha)**

Date of sowing	Varieties				Mean
	Solh 02	Gul 09	Muqawim 09	Kabul 013	
16-Nov-16	4906	5328	4682	5783	5175
01-Dec-16	4762	4894	4547	5142	4836
16-Dec-16	4241	4399	3958	4521	4280
31-Dec-16	4059	4193	3971	4302	4131
<b>Mean B</b>	4492	4703	4289	4937	
<b>Factors</b>	<b>CD at 5%</b>			<b>SEm ±</b>	
Date of sowing	401			124	
Varieties	364			126	
Varieties at same level of date of sowing	N/A			247	
Date of sowing at same level of varieties	N/A			252	

## 5. CONCLUSION

To obtain the higher yield of wheat crop under situation of Baghlan province, Afghanistan. The optimum date of sowing for wheat varieties of Solh 02, Gul 09, Muqawim 09, Kabul 013 found to be 16-Nov-16, however 01-Dec-16 is also suitable. Among the varieties Kabul 013 had higher but identical growth, yield attributes and yield of wheat with Gul 09 but significantly higher over rest of the varieties.

## 6. Recommendations

To obtain the higher yield of wheat crop under situation of Baghlan province, Afghanistan. Kabul 013 is recommended to be sown on 16-Nov-16.

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