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RESPONSE OF YIELD AND ITS COMPONENTS OF SOME BARLEY VARIETIES ARS TO SOWING DATE UNDER EL-BAIDA, LIBYA CONDITIONS

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ABSTRACT

Two filed experiments were conducted during the growing seasons 2008/2009 and 2009/2010 at Agricultural Research Station in Omar Al-Mukhtar University to investigate the response yield and its components of two six rows barley varieties (Wadi El-Koof and Giza 123) and one two rows Varity (Giza 128) three sowing dates (mid Nov., mid Dec. and mid Jan.) at El-Baida, Libya condition.

The obtained results indicated that the effect of sowing dates was significant on spike weight and biological yield in both seasons, and it was significant on main stem height in the first season, as well as was significant on tillers number/m^2, grain yield/ha and harvest index in second season, but it was insignificant on spikes number /m^2, grain number /spike, straw yield/ha and seed index in both seasons. Sowing date of mid December gave the highest grain yield/ ha compared to other sowing dates.
Result showed that barley varieties significant differed in spike number/m2 and spike weight in 2009/2010 season only and significant differed in all other traits in both seasons. The interaction effect between sowing dates and barley varieties was insignificant on all studied characters in both seasons.

INTRODUCTION

The rate of development of barley was dependent upon the response of genotypes (cultivars) to maximize potential crop yield and crop components under rain fed conditions. Crop growth must be early enough for the avoidance of water stress and high temperature during grain filling and sufficiently late to reduce the risk of winter damage at a thesis. The barley life-cycle prior to a thesis can be divided into 3 phases: the leaf initiation phase (LI), the spikelet initiation phase (SI), and the spikelet growth phase (SG) Kernich *et al.*, (1997). During these phases the pattern of development determiner (i) potential tiller number through the leaf number on the main culm (determined during the LI phase), ii potential number of spikelets per spike during SI phase and iii, survival of both tillers and spikelet primordial, which determine grain number per unit area during SG phase. Given the importance of optimizing the length of the growing period, and the influence of each phase in determining the number of grain and crop dry matter per unit of area, it is necessary to identify firstly of variation for the crop components, and secondly whether varying the details in spikes and crop yield would lead to an increased yield potential. (Kitchen and Rasmusson, (1983) and Miralles and Richards, 2000)

In this study we aimed to quantify the spikes and crop yields components responses of barley to cultivars under different times of seeding at El-Baida conditions in Libya.

MATERIALS AND METHODS

Two trials were conducted at El-Baida during 2008-2009 and 209-2010, seasons to study the effect of three sowing dates (Mid Nov., Mid Des. and Mid Janu.) on yield and its components of three barley varieties i.e Wadi El-Koof as Local varieties and Giza 123 (six rows) as well as Giza 128 varieties (two rows) under El- Baida condition, Libya. The experiment was laid out in split plot design with four replication. The main plots were occupied by sowing dates and barley varieties were distributed in the sub plots. The sup plot area was 6 m^2 (2×3m) simulated (21 43 N; 32 46, altitude 490m). Soil was medium to heavy cracking clay loams (vertisols) 0.6 to > 1m deep. The trials were located on the University of Omar Mukhtar Farmer's, the N and P status was characterized by determining the concentration of both in the soil at the depth 0-30 cm. Nitrogen and Phosphorus applied at the rate of 250 Kg/ha in the form of diammonium phosphate 18: 46. Soil was tilled in mid of Nov., 2009, barley crop cultivars Wadi El-Koof as a local and Giza 123, Giza 128 introduced cultivars from Egypt.

Seeding rate was 80Kg/ha drilling in rows 10cm apart. Weed control was necessary at all plots, and was achieved by hand removal. Salvage irrigation of the dry land trial was necessary because of drought condition plus rainfall during the growing period of both the seasons. During barley growth stages data were the record as follows:

- Main stem height (cm).
- Tiller number/m^2
- Number of spike / m^2
- Spike weight (g)
- Grains number / spike
- Biological yield (t/ha)
- Grain yield (t/ha)
- Straw yield (t/ha)
- Seed index (1000 grains in a gram)
- Harvest index = grain yield / biological yield

Results were submitted to analysis of variance with least significant differences (LSD) test P>0.05. according to Gomaze and Gomaze (1984)

RESULTS AND DISCUSSION

Average of main stem height, tillers number /m^2, spikes number/ m^2, spike weight, grains number / spike, biological yield (t/ha), grain yield (t/ha), straw yield (t/ha), seed index and harvest index of barley variety as affected by sowing dates in 2008/2009 and 2009/20010 seasons are shown in Tables 1 and 2.

The obtained results showed that the sowing dates had a significant effect on spike weight and biological yield t/ha in both seasons and it had significant effect on main stem height in first season, but significantly affected tillers number/m^2, grain yield/ ha and harvest index in the second season. On the other hand, the effect of sowing dates was insignificant on tillers

number/m^2 , grain yield/ha and harvest index in 2008/2009 season, but on main stem height in 2009/2010 season, as well as on spikes number /m2, grains number/ spike, straw yield / ha and seed index in both seasons.

However, sowing barley plants at mid December gave the highest values of main stem height 73.81 cm. in 2008/2009 season and grain yield /ha 0.96 ton in 2009/2010 season as well as spike weight 1.79 and 2.72 g and biological yield/ha 3.11 and 4.22 tons in 2008/2009 and 2009/2010 seasons, respectively. Compared to all other sowing dates under study in this trend, planting barley plants at mid November gave the highest tillers number/m2 211.00 and harvest index 23.67 as compared with all other sowing dates in 2009/2010 season. On the contrary sowing barley plants at mid January gave the lowest values of main stem height 50.60 cm in 2008/2009 season, tillers number 196.00, spike weight 2.17 g, grain yield/ha 0.57 ton and harvest index 18.68 in the second season, but biological yield /ha 2.83 and 3.05 ton as compared with other sowing dates in 2008/2009 and 2009/2010 seasons, respectively.

The increase in main stem height due to planting date of mid December may be attributed to increasing cell enlargement which led to raising stem length, but it had the optimum light and temperature to activate the tiller initiation. Also increasing spike number/m^2 sowing to mid December may be due to increasing tillers number/m^2. The increase in grain caused by sowing at December may be attributed yield to the increase in spikes number /m^2, grains number/ spike and spike weight. These results are in harmony with those of (Oscarsson *et al,* 1998), (Auskalnis, 2002), (Razzaque *et al.*, 2004), (Sebutis and Magyla, 2004) and (Sharma 2007).

Table (1): Effect of sawing dates and variety of barley on growth and yield components characters at El-Baida area during 2008/2009 and 2009/2010 seasons

Treatments	Main stem height(cm)		Tillers number /m^2		Spike number/m^2		Spike weight(g)		Grains number/spike	
	1st season	2nd season	1st season	2nd season	1st season	2nd season	1st season	2nd season	1st season	2nd season
Sowing dates (S)										
Mid Nov.	64.30	61.21	165.40	211.00	121.80	155.30	1.36	2.49	30.90	34.81
Mid Dec.	73.81	60.03	185.90	208.00	139.00	168.20	1.79	2.72	33.50	34.91
Mid Jan.	50.60	60.84	176.80	196.00	130.00	164.00	1.45	2.17	33.90	30.93
F	**	N.S	N.S	**	N.S	N.S	**	**	N.S	N.S
L.S.D	5.29			15.48			0.22	0.36		
Barley varieties (B)										
Wadi El-Koof	66.62	63.43	178.00	208.00	165.00	135.60	1.58	2.68	39.50	33.87
Giza 123	61.20	60.37	178.00	204.00	155.00	119.50	1.56	2.44	30.10	31.92
Giza 128	60.71	58.80	174.00	203.00	164.00	130.00	1.45	2.26	28.60	34.88
F	N.S	N.S	N.S	N.S	N.S	**	N.S	**	N.S	N.S
L.S.D						11.02		0.27		
Interaction S×B										
F	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S

Table (2): Effect of sawing dates and variety of barley on growth and yield components characters at El-Baida area during 2008/2009 and 2009/2010 seasons

Treatments	Biological yield t/ha		Grain yield t/ha		Straw yield t/ha		Seed index		Harvest index	
	1st season	2nd season	1st season	2nd season	1st season	2nd season	1st season	2nd season	1st season	2nd season
Sowing dates (S)										
Mid Nov.	2.98	3.97	0.80	0.94	2.18	3.03	34.22	35.29	26.84	23.67
Mid Dec.	3.11	4.22	0.82	0.96	2.29	3.26	34.18	35.12	26.36	22.74
Mid Jan.	2.83	3.05	0.77	0.57	2.06	2.48	35.41	35.09	27.20	18.68
F	*	*	N.S	*	N.S	N.S	N.S	N.S	N.S	*
L.S.D	0.15	0.58		0.21						1.73
Barley varieties (B)										
Wadi El-Koof	2.98	4.04	0.89	0.88	2.09	3.15	35.75	36.67	27.14	24.10
Giza 123	2.99	3.41	0.77	0.79	2.22	2.61	34.23	34.22	27.02	21.89
Giza 128	2.82	3.70	0.77	0.78	2.05	3.00	33.41	34.61	27.32	21.38
F	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S
L.S.D										
Interaction S×B										
F	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S

Results recorded in Tables 1 and 2 indicate that barley varieties significantly differed in spike number /m^2 and spike weight in the second season only, but it's not significantly differed in all other studied traits in both seasons. However, barley variety Wadi EL-Koof gave the heights values of spike number/m^2 135.60 and spike weight 2.68 g as compared with other used varieties, while the difference between variety Wadi EL-Koof and variety Giza 128 was insignificant in spike number/m^2 in 2009/2010 season. Also variety Wadi EL-Koof gave the highest grain yield/ha 0.89 and 0.88 ton as compared with other two varieties in 2008/2009 and 2009/2010 seasons, respectively, while the differences in grain yield/ha between the three varieties did not reach to the level of significance in both seasons. However, the increase in grain yield recorded by variety Wadi EL-Koof may be due to this variety gave the highest number of spikes/m^2 and spike weight which raising grain yield. These results are in harmony with those of (Kiniry *et al,* 1989), (Norman and Arkebauer 1991), (Soon and Arshad 2004) and (Razzaque and Ratiquzzaman 2006)

The obtained results showed that the interaction effect between sowing dates and barley varieties was insignificant on all studied traits in both seasons. These results suggested that the three studied barley varieties did not responded to different sowing dates in both season. Therefore, from these results it could be recommended that sowing any variety from studied varieties at any studied sowing dates gave insignificant differences of grain yield under El-Baida, Libya condition.

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استجابة المحصول ومكوناته في بعض أصناف الشعير لميعاد الزراعة تحت ظروف البيضاء ليبيا

طيب فرج حسن و آمال جمعة مفتاح.
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أقيمت تجربتين حقليتين بمحطة أبحاث جامعة عمر المختار خلال موسمي الزراعة ٢٠٠٨ / ٢٠٠٩ و ٢٠٠٩ / ٢٠١٠ لدراسة استجابة صنفين من شعير ذو ستة صفوف (وادي الكوف وجيزة ١٢٣) وصنف ذو صفين جيزة ١٢٨ لمواعيد الزراعة في منتصف شهر نوفمبر ومنتصف ديسمبر أو منتصف شهر يناير عند الزراعة بمعدل ٨٠ كجم / هكتار بالبيضاء ليبيا .

أظهرت النتائج ان تأثير مواعيد الزراعة كان معنويا علي وزن السنبلة والمحصول البيولوجي في كلا الموسمين وكان تأثيرها معنويا علي طول الساق الرئيسي في الموسم الأول فقط وكان تأثيرها معنويا علي عدد الأفرع/ م٢ ومحصول الحبوب / هكتار ودليل الحصاد في الموسم الثاني فقط.

ولكن كان تأثير مواعيد الزراعة غير معنوي علي عدد حبوب السنبلة ومحصول القش/هكتار ودليل البذرة في كلا الموسمين.وقد أعطي ميعاد الزراعة في نصف ديسمبر اعلي محصول حبوب/ هكتار مقارنة بالمواعيد الأخري في الموسم الثاني.

أوضحت النتائج أن أصناف الشعير اختلفت معنويا في عدد السنابل/ م٢ ووزن السنبلة في الموسم الثاني فقط ولكن كان اختلافها غير معنوي في باقي الصفات المدروسة في كلا الموسمين. وقد سجل الصنف وادي الكوف اعلي قيم لكلا من عدد السنابل/ م٢ ووزن السنبلة مقارنة بالأصناف الاخري.

أظهرت النتائج أن تأثير التفاعل بين مواعيد الزراعة و الأصناف كان غير معنوي علي الصفات المدروسة في كلا الموسمين.

قام بتحكيم البحث

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