Original Research Article

Effect of Different Weather Relationship in barley (*Hordeum Vulgare* L.)in Different Sowing Dates and Varieties in Prayagraj Conditions

ABSTRACT

This field trial was conducted during the spring season 2021-2022, and was conducted in the forestry field of Sam Higginbottom University of Agriculture Technology and Science Prayagraj UP. The experiment set a factor of RBD with three replicates with two factors. The first factor consists of three 15 ° C sowing dates. October 30 and November 15 while the second factor consists of three varieties of barley; Parth, SHB832 and RD 2052 crops sown on 15 November recorded an increase in seed yield compared to 30 October and 15 October. In cases of maximum barley plant growth coefficients were recorded under November 15 compared to October 30 and October 15 and in the case of maximum growth of cultivars, plant height, number of tillers per plant, plant dry weight, spike length, grain height per plant, test weight, grain yield, straw crop, was scored with the November 15 variety RD 2052 compared to the October 15 and October 30 variety SHB 832. The November 15 sowing with the variety RD 2052 proved to be the most profitable and economically viable for cultivation. Barley under agroclimatic conditions in Prayagraj AP.

***Keyword*:** plant height, No of tillers, dry weight, test weight, grain yield, Straw yieldand harvest Index etc.

INTRODUCTION

Barley (*Hordeum vulgare* L.) is an ancient cereal crop that makes up 7% of global cereal production. It's a high-altitude, cool-season crop **(Bayeh and Berhane, 2011)**. Barley is one of the first domesticated crops and is considered sacred in India. In ancient writings and beliefs, barley was regarded a health-benefiting cereal **(Malcolmson, 2014)**. In certain sections of the country, barley-based sattu is considered to have a cooling effect on the body. This article briefly describes barley as a food. Barley has more soluble fibers called beta glucans than other cereal grains **(Shah et al., 2017)**.

Bournvita, Boost, Maltova, etc. are made from barley malt extracts. Uttar Pradesh, Rajasthan, and Haryana consume dried barley. Due to its perceived cooling impact on the human system, it is favored to wheat for reducing liver and plasma cholesterol via inhibiting Co-A reductase. It promotes hepatic fatty acid production **(Foster and prentice, 2018).**

Material and Method

The experiment was carried out at the Sam Higginbottom University of Technology and Agricultural Sciences' forest field, Prayagraj -211007 (UP) located in the eastern-central part of Prayagraj at 16 210°N latitudes and 36810°E longitude and 289.5 m altitude above the Mediterranean level. The current experiment was conducted during the spring seasons of 2021-22.

Prayagraj is located at an altitude of 78 meters above sea level at latitude 25.870N and longitude 81.150E. This area has a subtropical climate that prevails in the southeastern part of UP. With both extreme temperatures, i.e. winter and summer. In cold winter, the temperature is sometimes as low as 8-10°C in December-January and very hot summer with temperatures as low as 48°C in May and June. The average rainfall is about 1013.4 (cm) with maximum concentration during the months of July to September with occasional showers in winter. The field experiment was conducted in RBD where three cultivars and three sowing dates were repeated three times. Hordeum vulgar cultivars Parth, SHB 832 and RD2052 were planted in the spring season at 15-day intervals on three planting dates beginning on October 15, 2022, October 30 and November 15.

The seeds were sown at a rate of 100 kg/ha in rows 22.5 cm apart and 3-4 cm deep by manual digging. Fertilizers were used according to the agricultural package recommended for the experiment such as Nitrogen @ 120 kg/ha, P_2O_5 at 60 kg/ha, and K_2O at 40 kg/ha. Weeding was carried out manually about 45 days after sowing. The four irrigations (excluding rainfall) were given to the crop for proper growth and development from sowing to maturity. Irrigation was given at CRI, tillering, flowering and milking respectively. Weeds were controlled by spraying 2-4D herbicide @ 0.75 kg/ha after emergence 30-35 days after sowing.

Resultsand Discussion

Plant growth and yield parameters

Among all applied treatments, maximum plant height was exhibited in T_9 var. RD 2052 (10.60, 51.40, 114) at 30, 60, 90, DAS respectively and found to be lowest in T_1 var. Parth (8.26, 45.20, 106) at 30, 60, 90 DAS respectively**Table (1)**.

Table (1).The plant height as influenced by different date of sowing and varieties

Treatments	Plant height		
	30 DAS	60 DAS	90 DAS
Date of sowing			
15th Oct 2021	8.544	45.7	107.522
30th Oct 2021	9.244	48.389	110.156
15th Nov 2021	9.878	50.067	112.189
SEm±	0.071	0.22	0.202
CD (p=0.05)	0.215	0.667	0.61
Varieties			
Parth	8.978	47.178	108.778
SHB 832	8.867	47.356	108.744
RD 2052	9.822	49.622	112.344
SEm±	0.071	0.22	0.202
CD (p=0.05)	0.215	0.667	0.61

The number of tillers per plant was exhibited maximum in T9 var. RD 2052(6.0 9.33 and 10) at 30, 60and 90 DAS and found to be lowest in T1 var. PARTH (4, 6.33 and 7.33) at 30, 60and 90 DAS respectively.

Table (2).The number of tiller as influenced by different date of sowing and varieties

Treatments	No of tillers		
	30 DAS	60 DAS	90 DAS
Date of sowing			
15th Oct 2021	4.667	7.111	7.889
30th Oct 2021	5	7.667	8
15th Nov 2021	5	7.778	8.667
SEm±	0.286	0.221	0.263
CD (p=0.05)	N/A	N/A	N/A
Varieties			
Parth	4.111	6.556	7.778
SHB 832	4.556	7.222	7.667
RD 2052	6	8.778	9.111
SEm±	0.286	0.221	0.263
CD (p=0.05)	0.866	0.668	0.794

Dry Weight of Plants (g) was exhibited maximum in T9 var. RD 2052 (0.48, 8.50 and 21.9gm) at 30, 60, and 90 DAS respectively and found to be lowest in T2 var. PARTH (0.40, 6.6 and 18.30) at 30, 60, and 90 DAS respectively.

Table (3).Dry weight as influenced by different date of sowing and varieties

Treatments	Dry weight		
	30 DAS	60 DAS	90 DAS
Date of sowing			
15th Oct 2021	0.446	7.033	19.948
30th Oct 2021	0.477	7.578	20.4
15th Nov 2021	0.456	7.589	20.356
SEm±	0.012	0.19	0.314
CD (p=0.05)	N/A	N/A	N/A
Varieties			
Parth	0.444	6.867	19.067
SHB 832	0.437	7.144	19.651
RD 2052	0.497	8.189	21.986
SEm±	0.012	0.19	0.314
CD (p=0.05)	0.036	0.575	0.949

Test Weight (gm) was exhibited maximum in T9 var. RD 2052 (39.00gm) and found to be lowest in T1 PARTH (37 gm) respectively. Grain Yield (q ha^{-1}) was exhibited maximum in T9 var. RD 2052 (29.92 q ha^{-1}) and found to be lowest in T1 var. PARTH (27.13 q ha^{-1}) respectively. Straw Yield (q ha-1) was exhibited maximum in T9 var. RD 2052 (19.43 q ha^{-1}) and found to be lowest in T1 var. PARTH (15.20 q ha^{-1}) respectively. , Harvest index was exhibited maximum in T1 var. PARTH (64.93) and found to be lowest in T9 var. RD 2052 (60.28) respectively.

Table (4).The yield parameters as influenced by different date of sowing and varieties.

Treatments	yield parameters			
	Test weight	Grain yield	Straw yield	Harvest index
Date of sowing				
15th Oct 2021	37.778	27.823	16.382	63.11
30th Oct 2021	37.889	28.463	17.904	61.406
15th Nov 2021	37.889	28.438	18.487	60.607
SEm±	0.342	0.209	0.317	0.43
CD (p=0.05)	N/A	N/A	0.959	1.299
Varieties				
Parth	37.222	27.838	16.979	62.266
SHB 832	37.222	27.756	16.949	62.136
RD 2052	39.111	29.131	18.846	60.721
SEm±	0.342	0.209	0.317	0.43
CD (p=0.05)	1.033	0.631	0.959	1.299

The maximum GDD, HTU,PTU consumed by 15 Oct. growing GDD, HTU, PTU consumed by 15 nov. Growing crop and in case of varieties maximum consumed by Parth and minimum consumed by RD 2052 variety

Table (5). Meteorological indies is as influenced by different date of sowing and varieties

Treatments	Meteorological indies		
	GDD	HTU	PTU
Sowing dates			
15th Oct 2021	1,393.22	8,594.61	15,133.67
30th Oct 2021	1,356.89	8,153.71	14,694.18
15th Nov 2021	1,293.33	7,564.66	13,935.45
SEm±	1.294	2.361	2.387
CD (p=0.05)	3.912	7.138	7.219
Varieties			
Parth	1,361.56	8,123.48	14,600.51
SHB 832	1,347.00	8,100.25	14,586.10
RD 2052	1,334.89	8,089.25	14,576.70
SEm±	1.294	2.361	2.387
CD (p=0.05)	3.912	7.138	7.219

Conclusion

Based on the results of the current research, it can be deduced that the third date of sowing (15 November 2021) was the one that produced the highest growth and yield for barley.

It was carried out based on an experiment that determined that the treatment T9(D3V3) var. RD2052, for barley (*Hordeum vulgare* L.) on Prayagraj, was effective. It was also determined to be important for achieving the highest crop growth and production. Further research is required in this case to verify the Prayagraj results. RD 2052, a type of barley, excelled in terms of growth and output. We may advise farmers in the Prayagraj area to prefer using the RD 2052 variety and sowing barley in the second and third weeks of November for better outcomes and yield based on our research.

REFRENCE

Assefa F, Maqsood M, Akabar M,Yousaf N (2017) Effect of urea fertilizer on growth response of food barley. Int J Agric Biol 1:359_436

Aula L, Dhillon JS, Omara P. Wehmeyer GB, Freeman KW, Raun WR (2019) World sulfur use efficiency for cereal crops. Agron J 111(5):2485-2492

Bayeh M, Berhane Lakew (2011) Barley research and development in Ethiopia-an over view. In: Malatu B. Grando S (eds). Barley research and development in ethiopia. Proceedings of the 2nd notational barley research and development review workshop pp 28-30 HARC Holetta, Ethiopia. ICARDA, P.O.box 5466, Aleppo, Syria. Pp xiv +391

BMBRI, Quality factors in malting barley, http://www.Bmbri.ca.2005

Central Statistical agency,Report on area and production of crops. Statistical bulletin, CSA, Addis Ababa, Ethiopia, 2017

D.kumar, V.kumar, R.P.S. Verma, A.S. kharub, and I.Sharma "Quality parameter requirement and standards for malt barley-a review" Agricultural Review vol . 34, no. 4. Pp. 313-317, 2013.

Goupy P, Hugues M, Boivin P and MJ Amio. 1999. Antioxidant composition and activity of barley (Hordeum vulgare) and malt extract and of isolated phenolic compounds. *Journal of agricultural and food chemistry* 79:1625-1634

I, Punda, Barley Malt Beer, Agribusiness Hand Book, FAO, Rome, Italy, 2009

Idehan E, tang Y and S Shengman. 2017. Bioactive phytochemicals in barley. *Jouranal of food and Drug Analysis 25:*148.161

Klopfenstien CF. 1998. The role of cereal beta-glucose in nutrition and health. *Cereal foods World.*33:865-869

Kumar S, (2004) A M.Sc. Thesis submitted in Department of Agronomy, CSAUA and T.Kanpur

Malcolmson L, Lukie C, Swallow K, Strurzenegger T and Han J. 2014. Using Barley Flour to Formulate Foods to meet Health Claims. *Cereal Foods World* 59:235-242