

Analysis of Some Varieties of Winter Barley (Hordeum Vulgare) for Beer in the Climatic Conditions of Dukagjini Plain



Agriculture

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Abstract

The object of study is the analysis of some varieties of winter barley (*hordeum vulgare*) for beer in the region climatic conditions of Dukagjini plain. Comparison of varieties has been a total of 4 cultivars of barley: Bingo, Vannes, Barun and Rex. Analysis of breeding and production are carried out in the region of Dukagjini: Peja Dukagjini Plain (in Arëbnesh, the Kosovo Institute of Agriculture research farm). Experiment was set according to the method of randomized blocks in three replication. In the laboratory at the Agricultural Institute of Kosovo, and close laboratory brewery in Peja. Cultivation analysis and production were analyzed yield (kg / ha), weight (1000 seeds in grams) hectoliter weight (kg), protein content (%), moisture (%), and Starch. The amount of protein in barley grain is one of the most important factors on which depend on the quality of beer production. In the amount of protein in barley grain with lots of variety characteristic, significantly influences the climate and agronomic factors of production, soil conditions during the vegetative season. Kosovo's agro-climatic and pedagogical data, compared with the yields obtained in the culture of winter barley show not using cultivated cultivars genetic potential to us. obtained results regarding showed that there were differences statistical significant different levels for all cultivars investigated traits involved in the plot compared to the standard (Rex).

Introduction

Study in Analysis of some varieties of winter barley (*Hordeum vulgare*) for beer in the climatic conditions of Dukagjini plain. Barley in Kosovo is a culture that is planted every year to meet the necessary requirements of manufactures for high yield, quality and many other factors necessary for high yield, quality and many other factors for malt as raw material for the production of beer, it is necessary cultivars research new to growing conditions in the Dukagjini Plain [Costa j. M. - Boller 2001], [Macgregor AW. 1991]. Dukagjini Plain has very good agronomic conditions for the cultivation of this crop. Barley is a plant in Europe occupies an important place in the structure of the cultivated plants. In our country, the years of transition, there was a significant reduction of the area planted with barley. Changing the structure of the variety that has come as a result of planting new varieties, has necessitated a study of the suitability of these varieties associated with different climatic conditions in Kosovo [Thomson JR. 1979], [Van Gastel AJG, Bishaw Z, Niane AA, 2005]. This adaptability not only see the impact of climatic conditions in different varieties manufacturing capabilities, but also on the impact of climatic factors in the qualitative barley destined for the production of beer [Alley MM 1997], [Bertholdsson N. O. 1999]. Planting barley cultivars in these two years is based on a study that determines the impact of climatic factors, temperature moisture on barley for beer production qualities. For this reason it was thought up this study, which will get underway to study the suitability of the main varieties of barley for beer in Kosovo. In these circumstances it is important to conduct studies for the evaluation of different varieties of barley on the main characteristics that define the quantity and quality of beer production [Papastylianou I. 1995]. From various studies it appears that the main characteristics of

manufacturing malt from barley seeds are protein content and their energy to come on earth. These features of seeds affected by growing conditions particularly in the grain formation stage [Gaqesha S, 1990].

To determine the amounts of fertilizer to surface units to be fed barley, special care had on the solvency of the soil, climatic conditions that prevail in the region [MM, Pridgen TH, Brann DE, Hammons JL, Mulford RL, 1997] , [Conry M.J. 1997]. Cultivars currently more prevalent in Dukagjini are Rex and Zllatko. In these circumstances it is important to conduct studies for the evaluation of different varieties of barley on the main characteristics that define the quantity and quality of beer production [Anderson OD, Haleford NG, Forde J, Yip RE, Shewry PR, 1988, Munck L, 1991]. From various studies it appears that the main characteristics of manufacturing malt from barley seeds are protein content and energy vegetation. The purpose of this study is to survey the response of the 4 varieties of barley (Bingo, Barun, Vannes, and Rex as comparator) during the vegetation environmental impact in two years 2011 and 2012 [Jenner CF, Logue SJ, Sedgley M, 1998]. Investigations of these barley varieties based on environmental effects and laboratory research.

Materials and Methods

Investigations were made during 2011 and 2012. The experiment was set according to the method of randomized blocks Fisher in three repetitions. Plots were organized lines and cultivated terrestrial surface property owned by the Kosovo Institute of Agriculture in location Arbnes, 6 km far from Peja. Type of soil, brown earth, and height over sea is 488 meters. Before planting barley culture soil samples are taken and analyzed [Anonym. 1995], [Schelling K, Born K, Weissteiner C, Kühbauch E, 2003]. The surface of each experimental plot was 10 m²

(10 m length x 1 m width). Barley seed planting is done at 3 - 5 cm depth.

Planting of plots is made with experimental Hege 80 planter.

Environmental effects on grain yield and quality parameters of winter barley, research carried out as follows [Bhuta, W, M, 2007], [Mckenzie, R.H. Middleton, A.B. & Bremer, E. 2005].

- laboratory determination of agro-chemical parameters of soil
- Yield – is specified in each version of experimented through analytical measurement accuracy scales to 1 gr [Kunze W, 2004].
- Weight hectoliter – defined by special scales bonerit.
- Absolute weight – analytical scales.
- Proteins - Kjeldahl's method.
- Humidity – Brabender device for measuring moisture in digital.

Results and discussion

Research laboratory

In laboratory conditions the barley cultivars were investigated following parameters:

Analysis of the soil in two areas, (Table 1.), Weight of 1000 seeds, hectoliter weight and yield

(Table 2.). Results of Humidity %, Protein % and Starch %.

Table 1. Analysis of soil in the area of Peja

Locality	Depth of profile	pH-water	CaCO ₃ %	N-Mineral mg/100 g		Humus %	Nutritional elements mg/100g			
				N-NH ₄	N-NO ₃		P ₂ O ₅	K ₂ O	Ca	Mg
Pejë	0-40 cm	5.6	5	0.431	0.382	4.2	15.8	26.8	204.7	17.2
		Neutral	average carbonates			secondary	secondary	rich	higher	higher

Data on physical and chemical characteristics of the soil are presented in (Table 1.) as indicated by the (Table 1.) chemical parameters are pH-water neutral, CaCO₃ average carbonates, humus secondary, P₂O₅ secondary, K₂O rich, Ca higher, Mg higher. On the basis of the parameters of the data are made and forwarded vegetative varieties investigated.

Table 2. Weight of 1000 seeds, weight hectoliter and yield

Cultivar	Locality Pejë	Weight of 1000 seeds (gr)	Weight hectoliter (kg)	Yield Kg/ha
Bingo	2011	54.20	58.85	5280
	2012	42.9	59.70	5798
Vanessa	2011	54.10	61.30	5350
	2012	48.17	58.02	6117
Rex	2011	41.90	64.56	4800
	2012	43.47	59.76	5798
Barun	2011	43.90	55.50	5100
	2012	45.73	59.55	5702

Analyses of all varieties are carried out immediately after barley harvest.

Also, from the table above, it is indicated that there were differences between cultivars of barley tested in winter compared to standard cultivars.

The fall of barley cultivars with high weight of 1000 seeds was found at Vanesa cultivar (54.10.17 g) (Table 2.), (Figure1) while the lowest weight of 1000 seeds is found at cultivar Rex (41.90 g and 43.47 g) (Table 2, Figure1). Weight hectoliter the highest is cultivar Rex 64.56. In Table 3 are given the results of % humidity, protein, and starch percent.

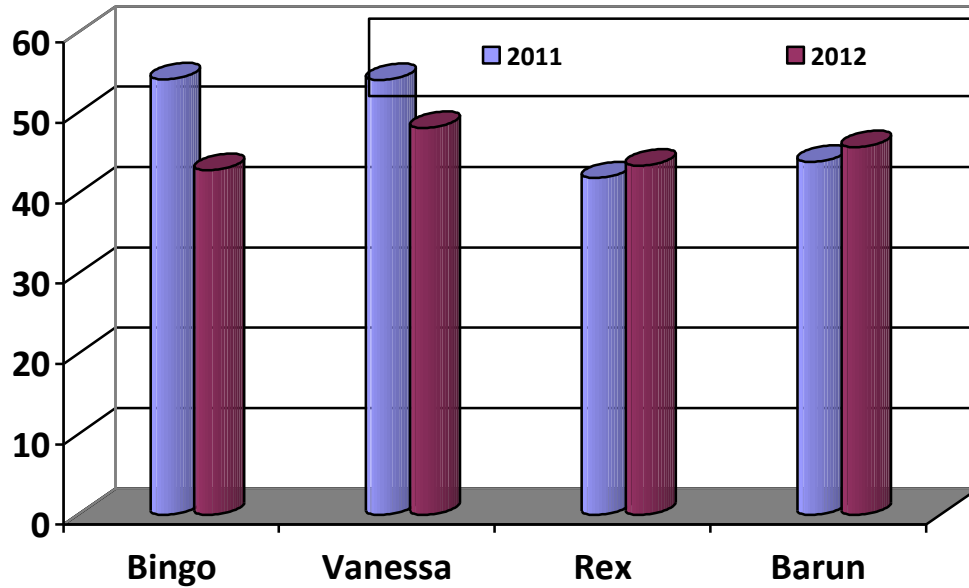


Figure 1. Weight of 1000 seeds

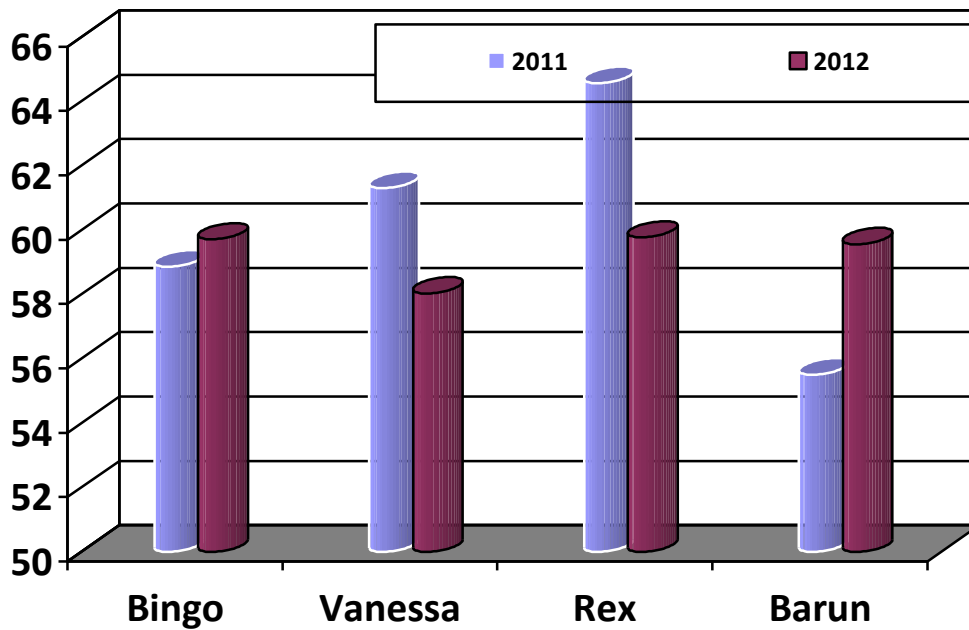


Figure 2. Weight hectoliter

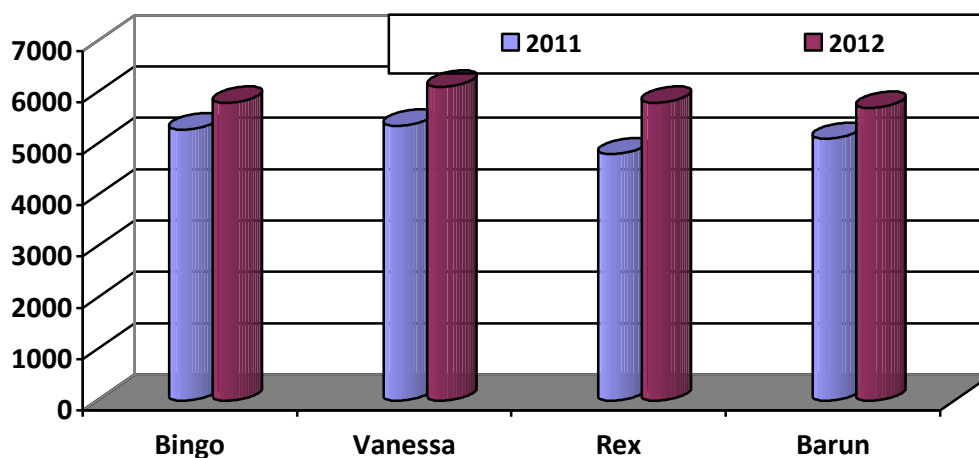


Figure 3. Yield

Table 3. Presentation of the results of Humidity %, Protein % and Starch %

Cultivar	Locality Pejë	Humidity %	Proteins %	Starch %
Bingo	2011	11.6	13.4	60.1
	2012	10.0	13.73	62.5
Vanessa	2011	12.1	12.7	60.1
	2012	11.1	12.9	63.6
Rex	2011	10.8	13.2	60.2
	2012	10.0	13.73	62.5
Barun	2011	11.4	12.9	60.3
	2012	11.26	13.4	61.4

Variety results presented in (Table 3.) show us that in this year humidity was lower, proteins are higher and starch is higher. Rex Varieties are higher Proteins, while Vanessa Proteins are lower.

Conclusions

- On the basis of the analysis of some varieties of winter barley (*hordeum vulgare*) for beer in the region climatic conditions of Dukagjini plain, (Arëbnesh - Peja) we can conclude the following:
 - The investigated cultivars with high production potential.
 - Planting performed in optimal time.
 - Soil analysis performed previously, as the content of essential nutrient elements (N, P, K).
 - Adequate and balanced use of fertilizer nutrients by the content of nutrient elements in soil and planned performance.
 - Higher yields this year in research have Zllatko plots in Dukagjini (Peja).
 - In the area of Dukagjini (Arëbnesh) 2012 Vanesa gave higher yield 6117 kg / ha compared to the 2011 5350 kg / ha other varieties have also shown positive results, so my high yields generally given plane Kosovo Dukagjini.
 - Circulation herbal respected in order to eliminate the possibility of potential attacks from damaging winter of Biological Agents (ADB),
 - Integrated Application Protection to the culture of wheat and barley but also before culture.

- Phase of vegetation development of barley varieties in the research, we can conclude that roughly approximate.
- Agro-ecological conditions and production sites have been found very suitable for the cultivation of barley, but always taking into account the application of an agro-ecological high.
- Use adequate and balanced nutrient fertilizers according to the content of nutrient elements in the earth, and planned yield
- Application of Integrated Protection of barley culture but also the first culture
- Using modern mechanist

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