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**THE RESPONSE OF SOME BARLEY VARIETIES (*HORDEUM VULGARE L.*) TO THE
 CURRENT CLIMATE CONTEXT IN DOBROGEA**

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Abstract: Barley (*Hordeum vulgare L.*) is one of the oldest cultivated plants. The research carried out focused on the response of some varieties (varieties) of autumn barley, grown in Dobrogea, on the varieties, from the point of view of the quality standards applied to the breweries. The contribution of the variety (variety) to the formation of the harvest and the determination of its quality, as well as the climate and soil conditions, as well as the application of certain variants of cultivation technology, are taken into account.
 The quality of barley grains used in the brewing process is regulated by Norms issued by the Ministry of Agriculture and the Ministry of Health. The respective norms establish the maximum content of foreign bodies that the barley harvest intended for beer can have, the maximum content of inert, mineral or organic bodies, the maximum content of weed seeds or seeds of other crop species, defects, attacked seeds, sprouted, moldy or undeveloped. Also, the barley grains used in the brewing process must meet sanitary standards and be food safe.
 The paper presents an analysis of six varieties of barley (*Hordeum vulgare L.*), present in culture in the Dobrogea region, Romania, with reference to the standards necessary to establish the quality of the harvests for industrialized barley (standards applicable to breweries), as well as identifying the manifestation of their genetic potential, in the current climate context. Also, the correlations between the obtained yield and each harvest quality index, separately, are presented. The research carried out aimed to determine the quality of autumn barley crops, grown in Dobrogea, established in the 2020-2021 agricultural year, by varieties, from the point of view of the quality standards applied to breweries. It is found that, in the climatic conditions of the agricultural year 2020-2021, malting barley had excellent qualities for breweries, with all varieties analyzed falling within the standards.

Introduction

The content of impurities in the varieties of barley and autumn barley grown in the 2020-2021 agricultural year in Dobrogea varied, on average, around 3.17% (2.9% for the Gabriela variety and 3.5% for the Artemis variety), from the point of view of the content of impurities, the barley from the analyzed varieties fell into the II grading class, according to SR 13477 - Barley for malt. The hectoliter weight of the analyzed barley varieties varied, on average, at approximately 69.32 kg/hl (68 kg/hl for the Emerald variety and 71 kg/hl for the Artemis variety). Analyzing the data presented in table 6, corroborated with the data presented in table 3, it follows that, from the point of view of the hectoliter mass, the analyzed varieties fell into grade 1, according to SR 13477 - Barley for malt. However, taking into account the fact that, from the point of view of the results obtained for the "impurities" parameter, it can be assigned Grade I only if it is subjected to conditioning operations.

Material and method

In the 2020-2021 agricultural year, observations were made on the climatic conditions as well as determinations on the production and quality of the fall common barley and barley harvest, from crops established in Tulcea County and within the Constanța County. The following varieties of barley and fall barley crops were harvested:

- Amethyst – fall barley
- Symbol – fall barley
- Emerald – fall barley
- Artemis – fall common barley
- Diana – fall common barley
- Gabriela – fall barley

In barley and fall common barley, the following quality parameters were monitored:

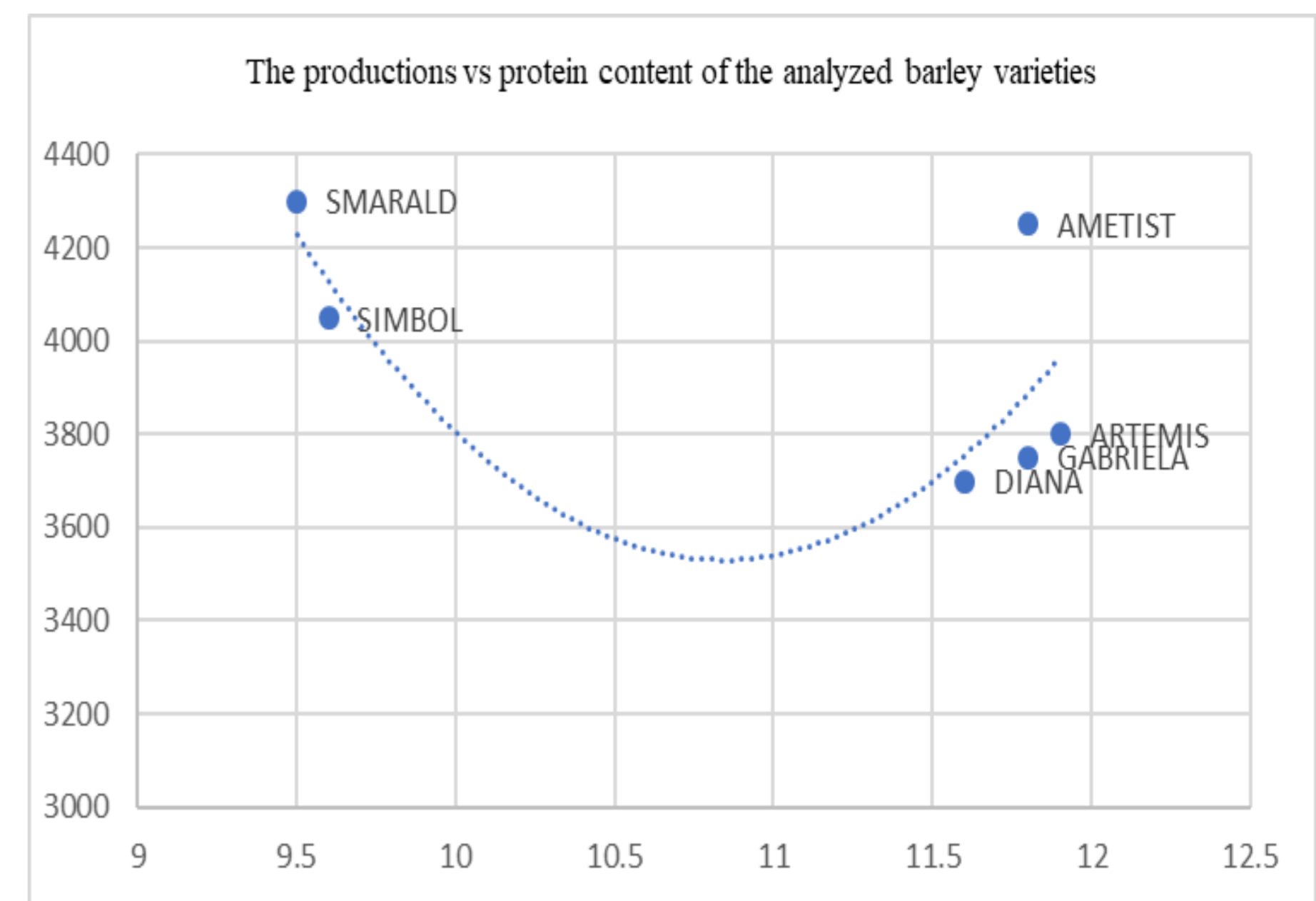
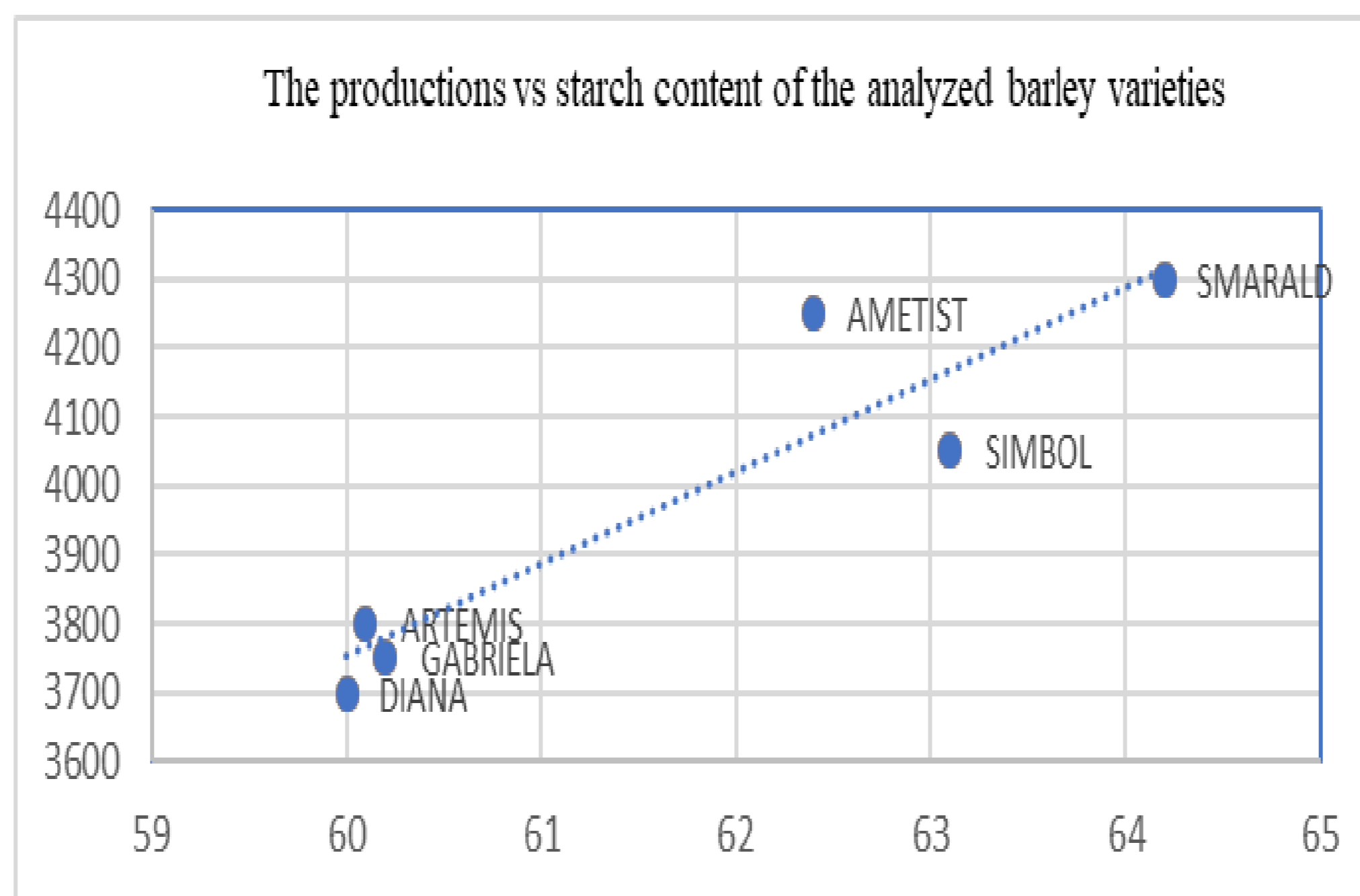
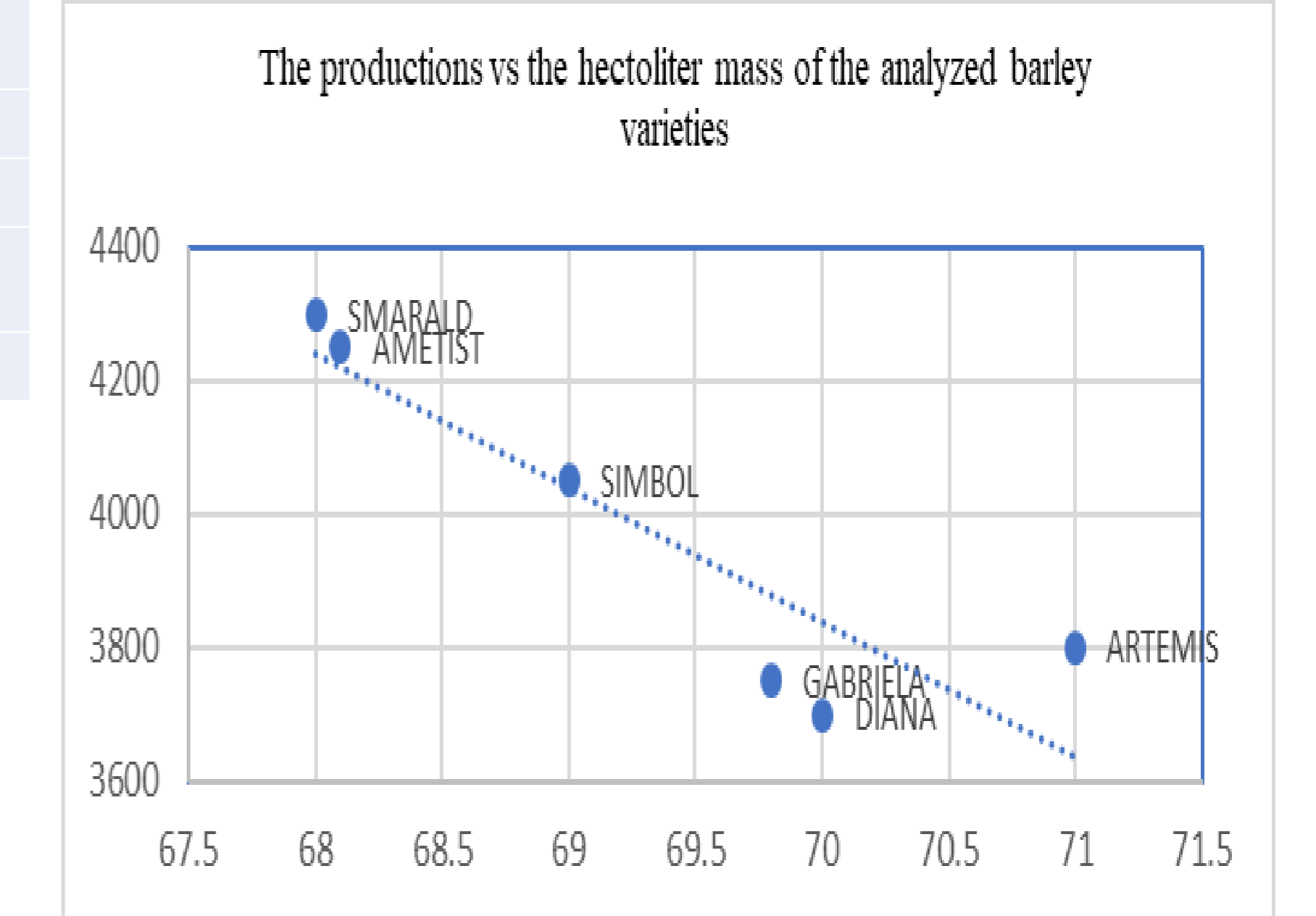
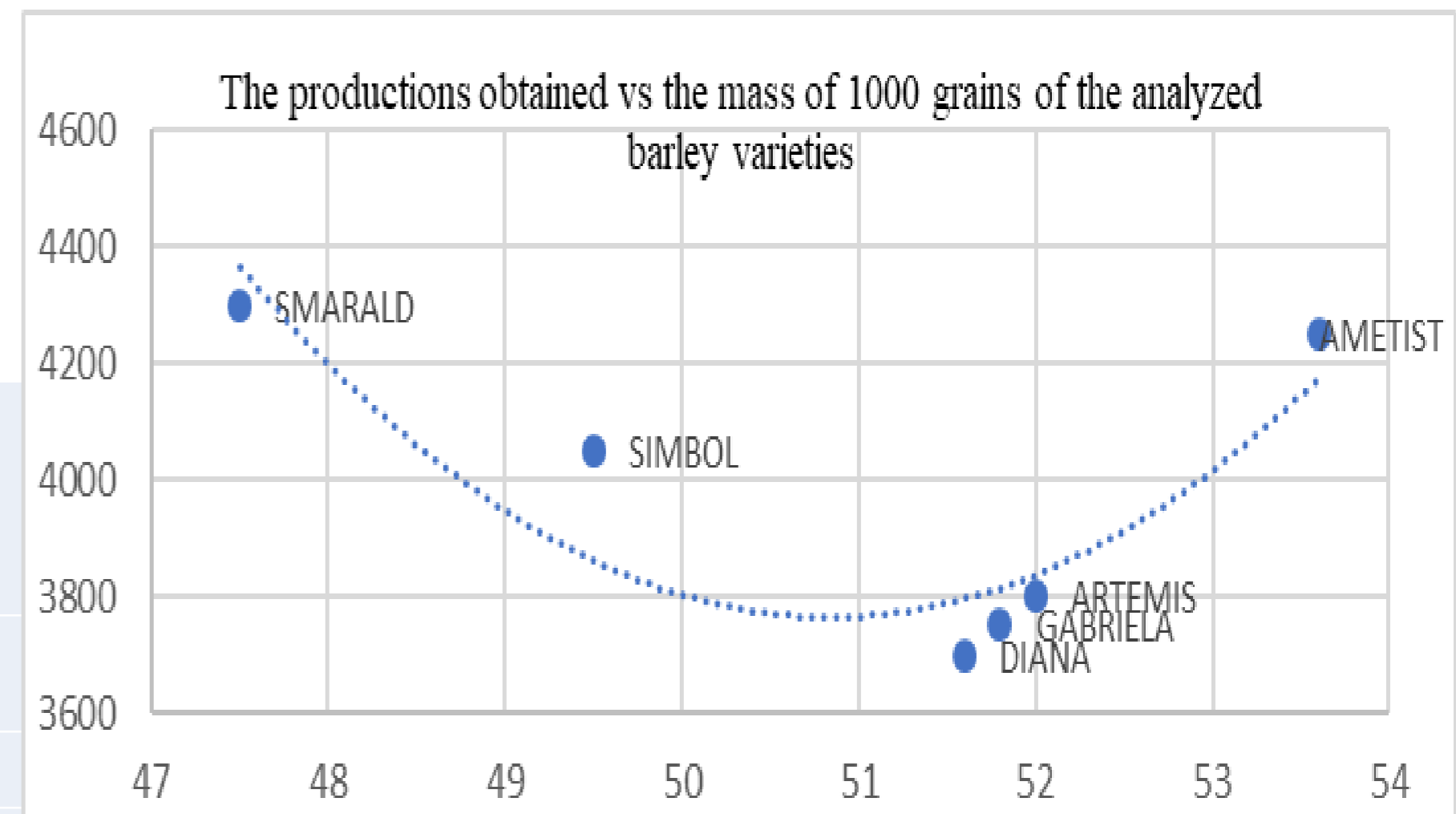
- Impurity content
- Weight of 1000 grains
- Hectoliter weight
- Starch content
- Protein content
- Moisture content
- Obtained productions

Results and discussions

Synthesis of the results obtained for the barley and fall barley varieties analyzed from the harvest of the 2020-2021 agricultural year in Dobrogea

Variety	Impurities content (%)	Mass of 1000 grains g	Hectoliter mass Kg/hl	Starch content %	Protein content %	Moisture content %	Productions Kg/ha
Amethyst	3	53.6	68.1	62.4	11.8	11.6	4250
Symbol	3.1	49.5	69	63.1	9.6	11.8	4050
Emerald	3.3	47.5	68	64.2	9.5	11.3	4300
Artemis	3.5	52.0	71	60.1	11.9	11.6	3800
Diana	3.2	51.6	70	60.0	11.6	11.5	3700
Gabriela	2.9	51.8	69.8	60.2	11.8	11.3	3750
Average	3.17	51	69.32	61.67	11.03	11.52	3975

The impurities content in the of barley and fall barley varieties grown in the 2020-2021 agricultural year in Dobrogea varied, on average, around 3.17% (2.9% for the Gabriela variety and 3.5% for the Artemis variety). Analyzing the data presented in Table, it results that, from the point of view of the content of impurities, barley and fall barley from crops established in the agricultural year 2020-2021 in Dobrogea fell into Grade II grading, according to SR 13477 – Barley for malt.



Conclusions

The quality of barley grains used in the brewing process is regulated by Norms issued by the Ministry of Agriculture and the Ministry of Health. The respective norms establish the maximum content of foreign bodies that the barley harvest intended for brewing beer can have, the maximum content of inert, mineral or organic bodies, the maximum content of weed seeds or seeds of other crop species, defective, attacked seeds, sprouted, moldy or undeveloped. Also, the barley grains used in the brewing process must meet sanitary standards and be food safe. Qualitative indicators are established, as well as microbiological conditions or content of toxic substances, residues or contaminants that may affect consumer health. The paper presents the standards required for establishing the quality of barley harvests intended for industrialization, with reference to the standards applicable to breweries, as well as determinations of quality indices for some varieties of barley and fall barley in Dobrogea. The research carried out was aimed at determining the quality of the autumn barley and sorghum crops, grown in Dobrogea, established in the 2020-2021 agricultural year, by variety, from the point of view of the quality standards applied to the breweries. It is found that, in the climatic conditions of the agricultural year 2020-2021, malting barley had excellent qualities for breweries, with all varieties analyzed falling within standards.

BIBLIOGRAPHY

- Draghici I. și colab, 1975 – Orzul, Editura Academiei Republicii Socialiste România, București;
- Dumitru D., și colab., 1997 – Agricultura României. Tendințe pe termen mediu și lung. Editura Expert, București;
- Hera Cr., 1999 – Agricultura durabilă performantă. Editura Agris, București;
- Roman Gh. V., Ion V., Epure Lenuta Iuliana, 2006 – Fitotehnie-Cereale și leguminoase pentru boabe. Editura Ceres, București;
- Săulescu N.N., 1986 – Relația dintre data înspicatului și producție în experiențele cu soiuri de orz. Probleme de genetică teoretică și aplicată, vol. XVIII;
- *** 2019 – Catalogul oficial al soiurilor (hibridurilor) de plante de cultură din România. București;
- *** faostat.org
- *** Manualul de gradare a semintelor de consum, 2017
- *** Colectia de Standarde de stat pentru controlul calității semintelor de consum
- *** Anuarul statistic al județului Constanța, 2020, 2021

