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RESEARCHES CONCERNING THE ASSESSMENT OF THE AGROPRODUCTIVE POTENTIAL OF NEW VARITIES OF CHERRY IN THE CLIMATE CONDITIONS IN NORTH OF ROMANIA

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Abstract
Cherry is a fruit species of particular economic importance, given by the nutritional, technological and commercial attributes of the fruits, which finds optimal conditions of the agroproductive potential in N-E.
The study aimed to assess the sensitivity to frost and the effect of low temperatures on the viability of fruit buds on 11 cherry varieties (4 foreign and 7 native) during 2017-2018.
Since the first part of 2018, observations and determinations have been made regarding the tree vigor (the trunk area cm), the length of annual growths and their number on the tree, the main fructification phenophases and the behavior towards the limiting factors of production (germ, drought, specific diseases of the cherry tree). As a result of the observations made, it was found that the limiting factors, namely the climatic conditions, did not directly influence the varieties studied.

Keywords: agroproductivity, cherry, temperature, viability.

1. INTRODUCTION

Cherry is an extensive species on very small areas in Romania, totalizing together with the sour cherry only 7,760.55 ha, the county of Iaşi holding the highest share (1.275 ha).
It has a lower temperature range of only 10 ° C, with the lower limit of 18 ° C, and the upper one with average values, 28 ° C, not supporting the heat, during which even in the wettest soils the leaves wither.
It has a frost resistance limit of -30 ° C. Precipitation claims are averages, ranging from 500 to 900 mm, but are the most sensitive species to excess soil moisture. The vegetation period is between 180 and 240 days and is provided in all areas of the country.
The distribution of the areas of maximum thermal favorability is quite limited in scope, in the Black Sea area and Teleorman County, but also in the counties of Iasi and Botosani.
The most unfavorable areas are the west of the Transylvanian Plain, the eastern Plateau of Tarnavas and Getic Subcarpathians.
The need for precipitation is ensured in many areas of the country, but the most unfavorable area is represented by Dobrogea and the eastern part of the Romanian Plain.

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Fost favorability of the species is highest in almost the entire country, except in Harghita County where culture is not recommended.
The most favorable soil texture is in the south and east of the Romanian Plain, but also in Dobrogea and Somes Plain, and the pH in the central and western parts of the Romanian Plain, Barlad Plateau and Someşan.
The histogram of global favorability is distributed to low values in which culture is excluded, but with very few settlements because of the effect of frost (Fig.1). However, up to about 2, the number of cases is very low.

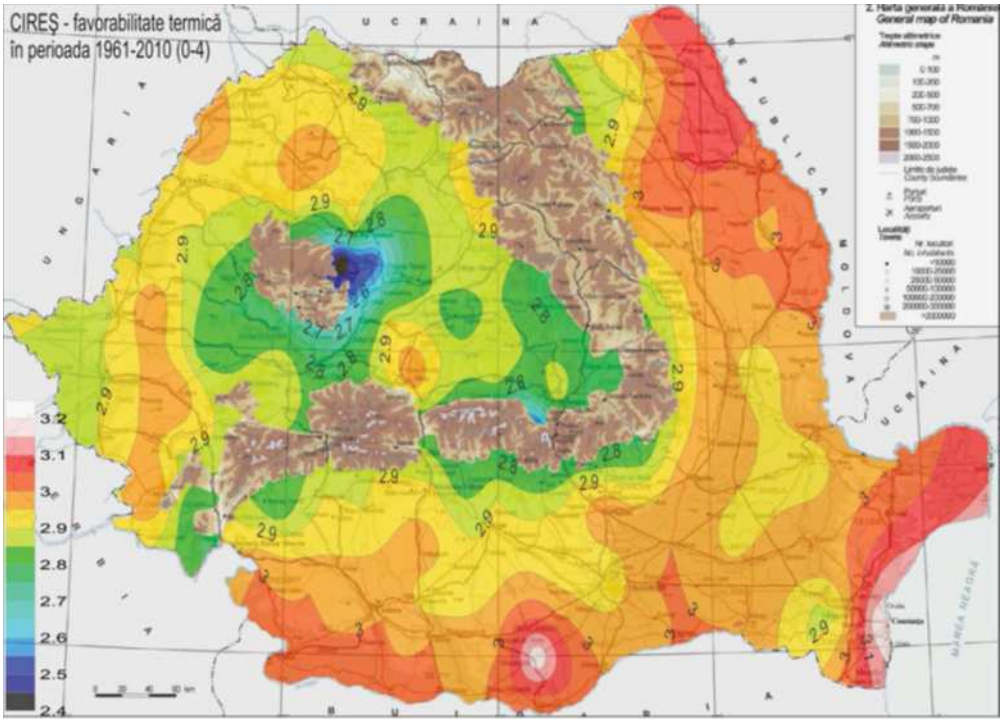

Fig. 1 Spatial distribution of thermal favoring areas in cherry species in Romania, delineated on the basis of climatic data from 1961-2010 (notes 0-4)

Most of the settlements are situated in favorable and very favorable areas for the cherry crop. The counties with the highest average grades are: Ilfov, Vaslui, Botosani, Salaj and Dambovita. At the opposite pole there are Harghita, Maramures and Covasna counties.

2. MATERIALS AND METHOD

Research on the estimation of the agro-productive potential of some cherry varieties was carried out in 2018 in a cherry plantation within SCDP Iaşi.
Observations were made on 11 varieties of cherry, assessing the sensitivity to frost, the effect of low temperatures on the viability of the fruit buds and the vigor of the trees.
The analysis of climatic conditions during the observation period was carried out through the AgroExpert weather station.

3. RESULTS AND DISCUSSIONS

The study period was characterized by low rainfall, unevenly distributed, without hailstorms with prolonged drought periods in April (11.8 mm), May (11 mm), August (2.4 mm) and September

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(17.4 mm), considered to be a deficient month in this respect, and in June and July there was an excess of precipitation, the values of deviation from the multiannual averages being between +90.87 mm and +114.67 mm (Table 1).

Table 1. Temperatures recorded at the meteorological station of SCDP Iasi

Month	Year 2018				
	TEMPERATURES			RAINFALL	HUMIDITY %
	AVERAGE	MINIMUM	MAXIMUM		
January	-0.98	-14,4	9,1	17,6	79,45
February	-2.03	-18.4	10.5	27.8	86.1
March	5.33	-17	18.6	71.2	78.45
April	15.3	1.5	29.5	11.8	54.6
May	18.48	4.8	32.2	11	58.38
June	20.44	7.2	34.3	164.6	71.8
July	20.67	8.5	32	140.8	80.19
August	22.67	11.4	33.8	2.4	66.48
September	16.57	2.1	31.1	17.4	68.5
October	12.32	2.4	26.7	2.4	65.34
November	2,46	-12,3	18,8	22,8	88
December	-1,41	-13,5	7,2	40,4	90,26

The largest quantities of water are required in May, June, July, which is during the active growth phase of shoots and fruits, when 20 mm precipitation is achieved, sufficient for this phase.

The winds in this area are heading along the Bahluiet Valley.

The highest winds are blowing from the northwest, especially winter and south-eastern, especially in the spring.

Winds blowing from the west bring water masses loaded with water vapor main cause to the rainfall that occurs here.Higher winds, when accompanied by rain, are damaging fruit plantations.

The study aimed to assess the sensitivity to frost and the effect of low temperatures on the viability of fruit buds to the varieties studied under the climatic conditions of winter 2018.

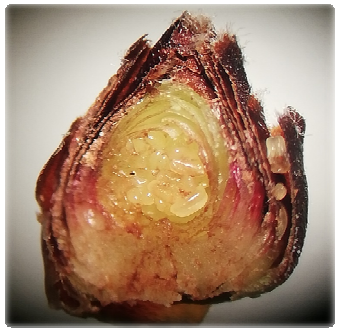

Fig 2. Bud section

Fig 3. Flower section

In performing the buds analysis, account must be taken of:

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- the analysis period - between November and January, before the campaign was launched;
- analyzing the varieties studied;
- taking samples is done by harvesting the fruits, labeling and transporting them in water.
- the samples brought to the laboratory are processed as follows: removing the wood from the current year, each bud is sectioned in such a way that 1/3 or 2/5 is removed by a longitudinal skew cut with a razor blade or knife (= 30-40%) of the bud; the severed buds are examined under a 24-40x binocular magnifier. In the case of differentiated shoots, in this vertical cut-out plan there appear 2-3 floral primordial round-oval shapes, inside of which are well seen the circular or semicircular pollen sacks of green color;
- the total number of examined buds is recorded and counted how many buds are viable and the amount is expressed as a percentage (Table 2 and Figure 4)

Table 2. Data on viability of fruit formations in cherry varieties

CHERRY Species Varieties:	Buds tested	Live buds	Affected buds	Viable buds %
Golia	35	35	0	100
Maria	35	35	0	100
Catalina	35	33	2	95
Marina	35	33	2	95
Bucium	35	35	0	100
Cetatuia	35	35	0	100
George	35	35	0	100
Kordia	35	34	1	97
Hudson	35	35	0	100
New Star	35	34	1	97
Regina	35	33	2	95

Starting with the first part of 2018, observations and determinations were made on tree vigor (trunk cm area), the length of annual growths and their number on the tree, the main fructification phenophases and the behavior towards the limiting factors of production (germ, drought, specific diseases of the cherry tree).
In the last decade of January 2018 and the first decade of February 2018, observations were made on the number and type of the formations of the fruit.
The number and type of fruit formations were determined by identifying and counting at least 3 trees of each variant along the length of the shingle before performing the cuttings and fructification cuts.
The predominant fruit formations in the varieties studied are the medium branches and the bouquets of May.

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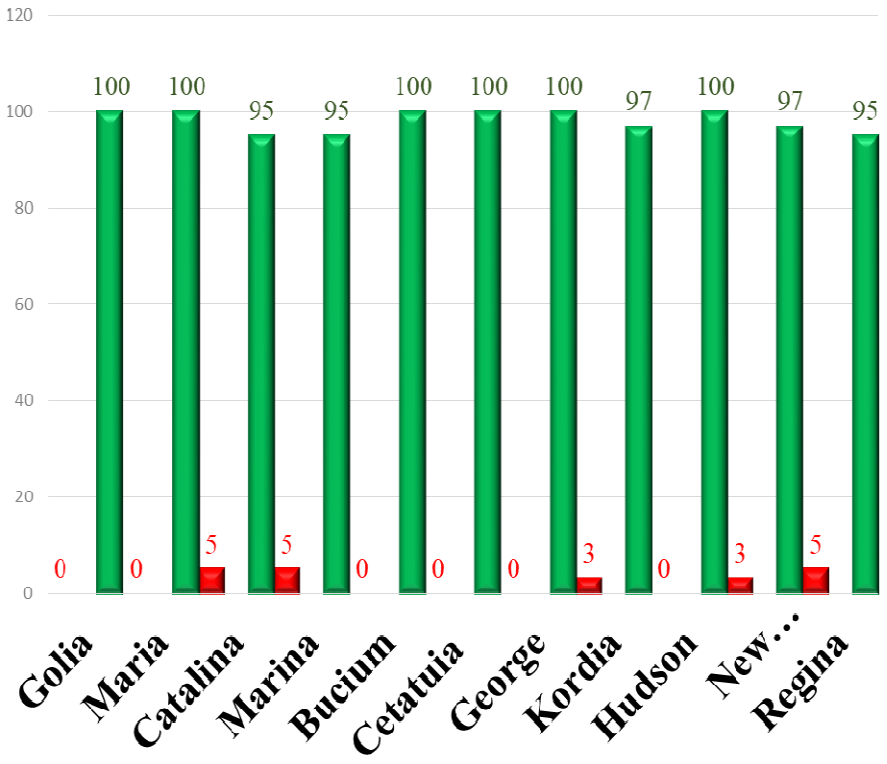

Fig. 4. Viability of buds expressed in percentages

Table 3. Data on the fruit formations of cherry varieties studied

No.crt	Variety	Shingle length (m)			Number of medium branches (pcs)			Number of bouquets (pcs)		
		v1	v2	v3	v1	v2	v3	v1	v2	v3
1	Regina	1.8	2	1.9	8	16	12	38	41	58
2	Kordia	1.95	1.55	1.4	6	5	4	18	25	15
3	Cetă□uia	2.4	1.8	1.6	11	5	7	39	26	20
4	Hudson	2.1	2.15	1.7	9	6	8	56	48	37
5	New Star	2.15	2.3	2.2	11	13	10	35	62	45
6	Marina	2.4	2.2	2.3	15	6	7	58	66	56
7	Bucium	2.1	1.9	2	6	10	4	22	16	20
8	Golia	1.9	1.85	1.65	6	4	6	21	18	40
9	Maria	1.6	1.75	1.85	12	6	4	52	18	22
10	Cătălina	1.75	1.4	1.6	7	5	3	27	30	17
11	George	1.9	2.4	2.3	8	11	5	36	28	26

4. CONCLUSIONS

In conclusion we can add that the limiting factors, respectively the low temperatures did not directly influence the varieties studied.

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During this period no significant loss of fruit buds was recorded, since the minimum negative temperatures, respectively -13.5 ºC, did not affect any of the studied species.
By analyzing the viability of buds of cherry varieties, a percentage of 5% was obtained which does not affect the production of fruit this year.
The analysis of the fruit formations shows that cherry varieties taken into account predominantly bear fruit in medium branches and bouquets of May, with some varieties being observed differences between the number of buds of medium and medium branches and bouquets of May.
The good productivity of these varieties leads to the recording of some fruit productions that ensure the profitability of the crop.

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