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PARTIAL RESULTS REGARDING THE EVOLUTION OF SOME POTATO GENOTYPES FOR CANOPY DEVELOPMENT AND YIELD COMPONENTS

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Current Trends in Natural Sciences

Abstract
At the National Institute of Research and Development for Potato and Sugar Beet – Brasov, Romania field experiments were carried out in order to collect data on quantitative traits (plant height, number tubers, tuber size, tuber weight) and yield of some new potato genotypes. It was used a complet randomized block design with four replicates. The number of steams varied between 14.5 steams / hill on genotype 1947/2 and 5.5 steam / hill on genotypes 1979/5 and 1901/12. The lowest value of the median leaf length was recorded at clone 21-1901/7 (56 cm) and the highest at clone 1947/2 (181 cm). Brasovia variety (control) has a poorly developed root system (48 g), also the genotypes 1891/7, 21-1895/1, 21-1901/7. Instead, genotypes 1901/6, 1927/1, 1971/9, 1965/16 have a high weight of the root system. Most spectacular production was provided by the line 1979/5 (77.90 t/ha), followed by the lines 1901/7 (45.55 t/ha) and 1939/2 (47.93 t/ha). The lines 1895/4, 1876/7, 1971/9, 1927/1, 1968/2, 1897/2, 1968/1 and 1947/2 also recorded significantly high productions.

Keywords: canopy, genotypes, potato, yield capacity

1. INTRODUCTION

Potato production provides food, employment and income as a cash crop (Scott et al., 2000) and helps in increasing food availability while contributing to a better land use ratio by raising the aggregate efficiency of agricultural production systems (Gastelo et al., 2014).

Potato produces the highest amount of energy per unit area and has the highest dry matter yield which may be 74.5% compared to wheat and 58% compared to rice (Ahmed et al., 2017).

The adoption of improved crop varieties is another important adaptation strategy. Using early-maturing varieties, which mature between 70 and 90 days, allows for more flexibility in planting and harvesting the crop (Bardhan, 2007, Also, traits like resistances and tolerances to biotic and abiotic stresses, such as heat and drought tolerance (Islam et al., 2016) are important in breeding program.

In potato crops, a good translocation of assimilates from the source to the tubers is decisive for the final production, along with an understanding of the patterns of that biomass allocation between the organs of the cultivated varieties and the effect of environmental conditions that improve the selection of materials for a location or general purpose (van Heemst, 1986; Tekalign and Hammes, 2005).

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The economic and social situation of Romania, developed within a market economy that requires farmers to obtain higher productions, entails competition and the introduction on the market of new varieties of potatoes. During the process of potato improvement in Romania, numerous varieties were created, which had a longer or shorter cultivation period, being always replaced by more performant ones. The variety, accompanied by a suitable planting material, is the main resource that leads to the achievement of production increases without a continuous and progressive increase in material and energy costs (Ianosi, 2002).
However, while countries with high-input agriculture (USA, France, Germany) can achieve average potato yields greater than 45 t/ha^{-1}, the average potato yields are 20 t/ha^{-1} worldwide (FAOSTAT, 2019; Koch et al., 2020). Potato is a key crop for global food security, as it gives rise to more nutritious food, more quickly, on less land than other cultivated food crops and even in severe conditions and additionally is the least vulnerable food crop to the unfavourable weather conditions and climatic change (Kruus et al., 2018; Kiiker 2020).

2. MATERIALS AND METHODS

Field experience was conducted in the fields of the Laboratory of Crop technology and good agricultural practices from NIRDPSB Brasov, Romania, in 2021, on a cambic chernozeum soil. The pre-crop was wheat and for current fertilizer was used 1000 kg/ha N:P:K:15:15:15+S.
The size of the plots was 9 m^2, the repetition is three-fold, the planting scheme is 75 × 30 cm, having 4 rows with 10 plants each one. Planting was done manually in May 3, 2021.
Treatments were applied for weed control (pre- and post-emergent), 2 treatments for Colorado beetle and 8 treatments for late blight control (alternating systemic products with contact). No irrigation was used.
Data on quantitative traits (plant height, number tubers, tuber size, tuber weight) and yield were collected. Significant differences were noted in all yields and quantitative traits.
Brasovia variety was taken as a control variant.
Potato tubers were harvested semi-mechanized on 5 October, 2021.
Results were subjected to statistical analysis, using one-way analysis of variance (ANOVA). Statistical differences with P-values under 0.05 were considered significant and means were compared by Duncan Multiple Range.

3. RESULTS AND DISCUSSIONS

Meteorological data

April month was colder than normal, with minimum negative air temperatures recorded for 10 consecutive days. Negative values were also recorded at ground level. The amount of precipitation that fell in April was 39.2 mm, which is 10.8 mm lower than the MAA. In May, the air temperature was lower by 1.3°C compared to the multiannual average, and the amount of precipitation was lower by 4.97 mm compared to the MAA value. June was a rainy month (106,1 mm), with precipitation in the first two decades even daily and with slightly higher temperatures than average (+0.8°C). in July the situation changed completely, registering much higher temperatures (+2.9°C) and a lower level of precipitation, by 28.7 mm compared to the multiannual average (Table 1).

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Table 1. ***Temperature average şi rainfall amount (October 2020 – September 2021) (Meteorological Station Ghimbav)***

Year/Month		Average air temperature °C)			Total rainfall (mm)		
		Accomplished	**MAA**	**Deviations**	**Realizat**	**MAA**	**Deviations**
2020	October	10.4	8.3	+2.1	76.8	38.9	+37.9
	November	2.2	3.1	-0.9	19.1	32.8	-13.7
	December	2.9	-2.2	+0.7	33.8	27.0	+6.8
2021	January	-1.0	-5.0	+4.0	22.6	25.5	-2.9
	February	0.9	-2.5	+1.6	7.2	23.9	-16.7
	March	1.6	2.6	-1.0	13.0	28.9	-15.9
	April	6.9	8.5	-1.6	39.2	50.0	-10.8
	May	12.3	13.6	-1.3	77.0	82.0	5.0
	June	17.3	16.5	+0.8	109.0	96.7	+12.3
	July	21.0	18.1	+2.9	71.1	99.8	-28.7
	August	18.5	17.5	+1.0	100.8	76.4	+24.4
	September	12.4	13.6	-1.2	32.0	52.5	-20.5
Winter period **(X-III)**		**2.8**	**0.7**	**+2.1**	**172.5**	**177.0**	**-4.5**
Summer period **(IV – IX)**		**14.7**	**14.6**	**+0.1**	**429.1**	**457.4**	**-28.3**

The number of steams varied greatly, between 22 steams/hill on genotype 1951/1 and 3.0 steam/hill on genotypes19-1876/7 and 21-1895/1. The number of stems per m^2 influences both the development of the foliage and the size of the tubers formed. The height showed a closer ratio between the clones, most of them being above the value of the plants registered at the control variety (79.5 cm). The lowest value of the median leaf length was recorded at clone 21-189/1 (12.67 cm), and the highest at clone 1968/2 (48 cm).

The tubers yield depends largely on the foliar surface achieved and its duration of photosynthetic activity. In the first period, the weight of the tubers correlates positively with the weight of the aerial part. This is also the case for the genotypes 1979/5, 1927/1, 1971/9, 1965/16, 1974/2 and 1941/8 (Table 2a.).

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Table 2a. ***Canopy development. Items at harvest I (Brasov, 8.07.2021)***

Genotype	Steam (no.)	Dif. (g)	Sig.	Plant lenght (cm)	Dif. (cm)	Sig.	Median leaf lenght (cm)	Dif. (cm)	Sig	Aerial part weight (g)	Dif. (g)	Sig.
1951/1	22.00	14.5	***	85.67	6.17	ns	24.67	-7.83	oo	425.00	31.00	ns
1979/5	4.00	-3.50	o	114.00	34.50	***	28.67	-3.83	ns	868.67	474.67	***
1957/8	6.00	-1.50	ns	72.67	-6.83	ns	24.67	-7.83	oo	409.00	15.00	ns
1901/12	6.00	-1.50	ns	110.67	31.17	***	30.67	-1.83	ns	600.67	206.67	ns
1897/2	4.67	-2.83	ns	78.67	-0.83	ns	28.00	-4.50	ns	676.00	282.00	*
1891/7	5.00	-2.50	ns	64.00	-15.50	oo	23.67	-8.83	***	372.00	-22.00	ns
1930/3	6.00	-1.50	ns	76.00	-3.50	ns	29.67	-2.83	ns	625.00	231.00	ns
1968/1	7.67	0.17	ns	93.67	14.17	*	24.67	-7.83	oo	873.67	479.67	***
19-1876/7	3.00	-4.50	oo	57.67	-21.83	ooo	18.00	-14.50	ooo	387.67	-6.33	ns
21-1901/7	4.67	-2.83	ns	56.00	-23.50	ooo	25.67	-6.83	oo	240.67	-153.33	ns
21-1895/1	3.00	-4.50	oo	65.67	-13.83	o	12.67	-19.83	ooo	276.67	-117.33	ns
1895/4	6.00	-1.50	ns	71.67	-7.83	ns	28.00	-4.50	ns	325.67	-68.33	ns
1901/11	9.00	1.50	ns	110.00	30.50	***	38.50	6.00	*	559.00	165.00	ns
1972/1	9.00	1.50	ns	129.00	49.50	***	40.00	7.50	**	679.50	285.50	*
1982/4	14.50	7.00	***	142.00	62.50	***	37.00	4.50	ns	718.00	324.00	*
1927/1	13.00	5.50	**	160.00	80.50	***	41.50	9.00	***	949.00	555.00	***
1971/9	12.00	4.50	**	130.00	50.50	***	39.00	6.50	*	1198.50	804.50	***
1948/2	12.00	4.50	**	121.50	42.00	***	39.00	6.50	*	780.00	386.00	**
1968/2	9.00	1.50	ns	114.50	35.00	***	48.00	15.50	***	648.00	254.00	*
1965/16	5.50	-2.00	ns	146.50	67.00	***	47.50	15.00	***	1566.00	1172.00	***
1947/2	16.00	8.50	***	181.00	101.50	***	40.50	8.00	**	1295.50	901.50	***
1941/8	4.00	-3.50	o	169.50	90.00	***	43.50	11.00	***	1032.00	638.00	***
1939/2	7.00	-2.00	ns	166.00	52.00	***	44.50	12.50	***	1225.00	285.50	*
1927/3	5.50	-2.00	ns	131.50	52.00	***	45.00	12.50	***	679.50	285.50	*
1939/4	10.00	2.50	ns	149.50	70.00	***	41.50	9.00	***	1159.50	765.50	***
1901/6	16.00	8.50	***	120.00	40.50	***	36.00	3.50	ns	892.50	498.50	***
Brasovia (Mt)	7.50	-	-	79.50	-	-	32.50	-	-	394.00	-	-
DL5%	3.28			8.96			4.23					
DL1%	4.38			11.95			5.65					
DL0,1%	5.70			15.56			7.35					

Potato production is directly proportional to the weight of the root system and the active leaf area. There is a positive correlation between the vegetative mass and the depth of penetration of the roots. The development of the root system is largely determined by variety, but is also influenced by climatic and agrotechnical conditions. Early varieties have a more superficial and less developed root system than semi-late and late varieties.

Brasovia variety (control) has a poorly developed root system (48 g), also the genotypes 1891/7, 21-1895/1, 21-1901/7. Instead, genotypes 1901/6, 1927/1, 1971/9, 1965/16 have a high weight of the root system.

The genotype 1901/6 is distinguished by the large number of tubers (28.5 tubers) and their high weight (2075.5 g). Clone 1948/2 also showed a positive correlation between the number of tubers and their weight (Table 2b.).

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Table 2b. ***Canopy development. Items at harvest I (Brasov, 8.07.2021)***

Genotype	Under ground part weight	Dif. (g)	Sig.	Tuber no./hill	Dif. (cm)	Sig.	Tubers weight/hill	Dif. (g)	Sig.
1951/1	63.00	15.00	ns	23.00	3.50	ns	1287.67	595.17	*
1979/5	119.00	71.00	***	20.67	1.17	ns	1781.67	1089.17	***
1957/8	54.00	6.00	ns	21.67	2.17	ns	764.00	71.50	ns
1901/12	63.67	15.67	ns	20.67	1.17	ns	781.00	88.50	ns
1897/2	82.67	34.67	*	24.00	4.50	ns	617.67	-74.83	ns
1891/7	43.00	-5.00	ns	14.00	-5.50	ns	811.67	119.17	ns
1930/3	69.67	21.67	ns	27.67	8.17	ns	1257.67	565.17	*
1968/1	110.00	62.00	***	15.00	-4.50	ns	987.00	294.50	ns
19-1876/7	54.67	6.67	ns	15.00	-4.50	ns	397.67	-294.83	ns
21-1901/7	40.67	-7.33	ns	15.00	-4.50	ns	586.67	-105.83	ns
21-1895/1	44.00	-4.00	ns	14.00	-5.50	ns	871.00	178.50	ns
1895/4	73.67	25.67	ns	14.00	-5.50	ns	582.67	-109.83	ns
1901/11	98.50	50.50	**	28.00	8.50	ns	1115.00	422.50	ns
1972/1	103.50	55.50	**	30.00	10.50	*	876.00	183.50	ns
1982/4	110.50	62.50	***	40.00	20.50	***	1351.50	659.00	*
1927/1	142.00	94.00	***	35.50	16.00	**	1579.00	886.50	**
1971/9	139.00	91.00	***	34.50	15.00	**	821.50	129.00	ns
1948/2	121.50	73.50	***	44.50	25.00	***	2855.50	2163.00	***
1968/2	83.00	35.00	*	31.50	12.00	*	1977.50	1285.00	***
1965/16	149.50	101.50	***	28.00	8.50	*	1720.50	1028.00	***
1947/2	109.00	61.00	***	43.00	23.50	***	1983.00	1290.50	***
1941/8	94.00	46.00	**	16.00	-3.50	ns	1069.00	376.50	ns
1939/2	103.50	40.50	*	27.00	4.50	ns	1405.00	654.50	*
1927/3	88.50	40.50	*	24.00	4.50	ns	1347.00	654.50	*
1939/4	86.50	38.50	*	37.00	17.50	***	1135.50	443.00	ns
1901/6	142.00	94.00	***	48.00	28.50	***	2075.50	1383.00	***
Brasovia	48.00	-	-	19.50	-	-	692.50	-	-
DL5%	31.98			9.47			506.87		
DL1%	42.64			12.63			675.83		
DL0.1%	55.52			16.44			880.09		

To the second assessment the number of steams varied between 14.5 steams / hill on genotype 1947/2 and 5.5 steam / hill on genotypes 1979/5 and 1901/12. The lowest value of the median leaf length was recorded at clone 21-1901/7 (56 cm) and the highest at clone 1947/2 (181 cm) (Table 2a.).

The tubers yield depends largely on the foliar surface achieved and its duration of photosynthetic activity. The weight of the tubers correlates positively with the weight of the aerial part. This is also the case for the genotypes 1979/5, 1927/1, 1971/9, 1965/16, 1974/2 and 1941/8 (Table 3a.).

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Tabel 3a. ***Canopy development. Items at harvest II (Braşov, 27.07.2021)***

Genotype	Steam (no.)	Dif. (g)	Sig.	Plant lenght (cm)	Dif. (cm)	Sig.	Median leaf lenght(cm)	Dif. (g)	Sig.	Aerial part weight (g)	Dif. (g)	Sig.
1951/1	12.00	4.50	**	85.67	6.17	ns	24.67	-7.83	oo	425.00	31.00	ns
1979/5	5.50	-2.00	ns	114.00	34.50	***	28.67	-3.83	ns	868.67	474.67	***
1957/8	7.00	-0.50	ns	72.67	-6.83	ns	24.67	-7.83	oo	409.00	15.00	ns
1901/12	5.50	-2.00	ns	111.67	31.17	***	30.67	-1.83	ns	600.67	206.67	ns
1897/2	10.50	3.00	*	78.67	-0.83	ns	28.00	-4.50	ns	676.00	282.00	*
1891/7	6.00	-1.50	ns	64.00	-15.50	oo	23.67	-8.833	***	372.00	-22.00	ns
1930/3	7.00	-0.50	ns	76.00	-3.50	ns	29.67	-2.83	ns	625.00	231.00	ns
1968/1	8.50	1.00	ns	93.67	14.17	*	24.67	-7.83	oo	873.67	479.67	***
19-1876/7	7.00	-0.50	ns	57.67	-21.83	ooo	18.00	-14.50	ooo	387.67	-6.33	ns
21-1901/7	6.50	-1.00	ns	56.00	-23.50	ooo	25.67	-6.83	oo	240.67	-153.33	ns
21-1895/1	5.67	-1.83	ns	65.67	-13.83	o	12.67	-19.83	ooo	276.67	-117.33	ns
1895/4	5.67	-1.83	ns	71.67	-7.83	ns	28.00	-4.50	ns	325.67	-68.33	ns
1901/11	12.00	4.50	**	110.00	30.50	***	38.50	6.00	*	559.00	165.00	ns
1972/1	10.00	2.50	ns	129.00	49.50	***	40.00	7.50	**	679.50	285.50	*
1982/4	12.00	4.50	**	142.00	62.50	***	37.00	4.50	ns	718.00	324.00	*
1927/1	7.50	0.00	ns	160.00	80.50	***	41.50	9.00	***	949.00	555.00	***
1971/9	12.00	4.50	**	130.00	50.50	***	39.00	6.50	*	1198.50	804.50	***
1948/2	10.00	2.50	ns	121.50	42.00	***	39.00	6.50	*	780.00	386.00	**
1968/2	7.50	0.00	ns	114.50	35.00	***	48.00	15.50	***	648.00	254.00	*
1965/16	8.50	1.00	ns	146.50	67.00	***	47.50	15.00	***	1566.00	1172.00	***
1947/2	14.50	7.00	***	181.00	101.50	***	40.50	8.00	**	1295.50	901.50	***
1941/8	5.50	-2.00	ns	169.50	90.00	***	43.50	11.00	***	1032.00	638.00	***
1939/2	8.50	-1.50	ns	166.00	52.00	***	44.50	12.50	***	1225.00	285.50	*
1927/3	6.00	-1.50	ns	131.50	52.00	***	45.00	12.50	***	679.50	285.50	*
1939/4	9.00	1.50	ns	149.50	70.00	***	41.50	9.00	***	1159.50	765.50	***
1901/6	18.00	10.50	***	120.00	40.50	***	36.00	3.50	ns	892.50	498.50	***
Brasovia (Mt)	7.50	-	-	79.50	-	-	32.50	-	-	394.00	-	-
DL5%=	11.34			5.09			2.70			249.49		
DL1%=	15.12			6.78			3.60			332.65		
DL0,1%=	19.69			8.83			4.69			433.19		

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Tabel 3b. Canopy development. Items at harvest II (Brasov, 27.07.2021)

Genotype	Under ground part weight	Dif. (g)	Sig.	Tuber no./hill	Dif. (cm)	Sig.	Tubers weight/hill	Dif. (g)	Sig.
1951/1	63.00	15.00	ns	23.00	3.50	ns	1287.67	595.17	*
1979/5	119.00	71.00	***	20.67	1.17	ns	1781.67	1089.17	***
1957/8	54.00	6.00	ns	21.67	2.17	ns	764.00	71.50	ns
1901/12	63.67	15.67	ns	20.67	1.17	ns	781.00	88.50	ns
1897/2	82.67	34.67	*	24.00	4.50	ns	617.67	-74.83	ns
1891/7	43.00	-5.00	ns	14.00	-5.50	ns	811.67	119.17	ns
1930/3	69.67	21.67	ns	27.67	8.17	ns	1257.67	565.17	*
1968/1	110.00	62.00	***	15.00	-4.50	ns	987.00	294.50	ns
19-1876/7	54.67	6.67	ns	15.00	-4.50	ns	397.67	-294.83	ns
21-1901/7	40.67	-7.33	ns	15.00	-4.50	ns	586.67	-105.83	ns
21-1895/1	44.00	-4.00	ns	14.00	-5.50	ns	871.00	178.50	ns
1895/4	73.67	25.67	ns	14.00	-5.50	ns	582.67	-109.83	ns
1901/11	98.50	50.50	**	28.00	8.50	ns	1115.00	422.50	ns
1972/1	103.50	55.50	**	30.00	10.50	*	876.00	183.50	ns
1982/4	110.50	62.50	***	40.00	20.50	***	1351.50	659.00	*
1927/1	142.00	94.00	***	35.50	16.00	**	1579.00	886.50	**
1971/9	139.00	91.00	***	34.50	15.00	**	821.50	129.00	ns
1948/2	121.50	73.50	***	44.50	25.00	***	2855.50	2163.00	***
1968/2	83.00	35.00	*	31.50	12.00	*	1977.50	1285.00	***
1965/16	149.50	101.50	***	28.00	8.50	*	1720.50	1028.00	***
1947/2	109.00	61.00	***	43.00	23.50	***	1983.00	1290.50	***
1941/8	94.00	46.00	**	16.00	-3.50	ns	1069.00	376.50	ns
1939/2	103.50	40.50	*	27.00	4.50	ns	1405.00	654.50	*
1927/3	88.50	40.50	*	24.00	4.50	ns	1347.00	654.50	*
1939/4	86.50	38.50	*	37.00	17.50	***	1135.50	443.00	ns
1901/6	142.00	94.00	***	48.00	28.50	***	2075.50	1383.00	***
Brasovia (mt)	48.00	-	-	19.50	-	-	692.50	-	-
	DL5%=31,98			DL5%=9,47			DL5%=506,87		
	Dl1%=42,64			DL1%=12,63			DL1%=675,83		
	DL0,1%= 55,52			DL0,1%=16,44			DL0,1%=880,09		

At the assessment of July 27, 2021, there is a decrease in biomass (leaves + stems) in favor of the accumulation of tuber production, the process being determined by the climatic conditions specific to the year, area and earliness of the genotype.

It can be noted a balance of the weight of the aerial part with the number, respectively with the weight of the tubers for the genotypes 1979/5, 1965/16, 1947/2 and 1901/6.

The production of tubers is determined by the number and size of tubers, the highest values being recorded in the genotypes 1948/2, 1965/16, 1947/2 and 1901/6 (Table 3b.).

The most spectacular production was provided by the line 1979/5 (77.90 t/ha), followed by the lines 1901/7 (45.55 t / ha) and 1939/2 (47.93 t / ha). The lines 1895/4, 1876/7, 1971/9, 1927/1, 1968/2, 1897/2, 1968/1 and 1947/2 also recorded significantly high productions (Table 4).

We consider that the main causes of lower production in some lines are the deficit of water in the soil during the growth of the tubers and the uneven distribution of precipitation during the vegetation period.

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Table 4. Total yield tuber/ha (t/ha)

Genotype	Tub. > 60 mm	Tub. 35-60 mm	Tub. <35 mm	Yield (t/ha)
1968/1	26.85	14.92	0.87	42.65
1947/2	21.64	16.93	1.65	40.21
1901/6	3.12	28.55	2.61	34.27
1901/11	21.04	18.09	0.74	39.87
1951/1	20.11	24.30	1.62	46.03
1972/1	7.19	35.14	5.70	48.03
1939/4	7.96	21.68	2.61	32.25
1895/4	24.20	17.48	0.85	42.52
19-1876/7	18.71	22.61	2.77	44.10
1979/5	47.35	29.53	1.02	77.90
1941/8	18.71	22.95	1.38	43.04
1982/4	5.29	25.75	2.05	33.09
21-1901/7	19.19	25.39	0.97	45.55
1939/2	28.08	17.59	2.26	47.93
1971/9	11.94	28.23	2.21	42.39
1901/12	11.35	21.19	1.79	34.34
21-1895/1	12.39	16.05	0.69	29.13
1927/3	5.40	18.14	0.79	24.33
1968/2	20.42	19.30	0.47	40.19
1891/1	7.65	10.75	0.21	18.61
1930/3	12.63	16.97	0.51	30.11
1965/16	25.77	12.13	0.46	38.35
1948/2	4.72	18.29	2.47	25.49
1897/2	13.10	25.95	1.27	40.31
1957/8	13.13	21.44	1.09	35.67
1927/1	18.08	23.71	1.53	43.33
Brasovia (mt)	4.71	17.44	1.50	23.65
DL 5%	14.80	11.95	1.66	16.24
DL1%	19.74	15.93	2.22	21.65
DL 0.1%	25.70	20.75	2.89	28.20

4. CONCLUSIONS

The inventory of genetic resources and the enhancement through various genotypes that combine the qualities of disease and pest resistance with the agronomic qualities of the tubers is a decisive step in obtaining varieties that meet the increasingly sophisticated market requirements, the demands of processors and end of consumers.

The number of steams varied greatly, between 22 steams/hill on genotype 1951/1 and 3.0 steam/hill on genotypes19-1876/7 and 21-1895/1 at first assessment and between 14.5 steams/hill on genotype 1947/2 and 5.5 steam / hill on genotypes 1979/5 and 1901/12 to the second assessment.

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The lowest value of the median leaf length was recorded at clone 21-189/1 (12.67 cm) and the highest at clone 1968/2 (48 cm) at first assessment and the lowest value at clone 21-1901/7 (56 cm) and the highest at clone 1947/2 (181 cm) to the second assessment.
The weight of the tubers correlates positively with the weight of the aerial part to the first assessment for the genotypes 1979/5, 1927/1, 1971/9, 1965/16, 1974/2 and 1941/8 and to the second assessment for the genotypes 1979/5, 1927/1, 1971/9, 1965/16, 1974/2 and 1941/8
High yield was provided by the line 1979/5 (77.90 t / ha), followed by the lines 1901/7 (45.55 t/ha) and 1939/2 (47.93 t/ha).

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