

New potato varieties created at the National Institute of Research and Development for Potato and Sugar Beet Brasov

Hermeziu R.^{1*}, Hermeziu Manuela¹, Stefan Floriana Maria¹

¹National Institute of Research and Development for Potato and Sugar Beet Brasov, Romania

* Corresponding author: email: hermeziuum@hotmail.com

Abstract Potato breeding are oriented to obtain varieties with resistance to biotic and abiotic factors and with high yield capacity to satisfy the both quantitative and qualitative needs of consumers.

Productivity, quality and stability are achieved through crop improvement works to promote new varieties with advanced traits.

Among the achievements of National Institute of Research and Development for Potato and Sugar Beet in 2014 are registered the varieties Brasovia, Castrum, Marvis and Sarmis.

These varieties are medium early and there are obtained through sexual hybridization and individual clonal selection.

All mentioned varieties have a high yield capacity and resistance to black wart (*Synchytrium endobioticum*), middle resistance to different viruses (PVY⁰ and PLRV) and to late blight (*Phytophthora infestans*).

The consumption destination is for autumn-winter, being suitable for all kinds of culinary preparations, from salads to mash potatoes.

Key words

new potato variety, Braşovia, Castrum, Marvis, Sarmis, genealogy, characterization, yield capacity

The potato variety being a living organism which is multiplied vegetatively is developing its own and after a constant period declines due to viral degeneration and climate. Increasingly complex demands of consumers and the many new varieties from the market make a number of existing varieties to be replaced by others that respond better to the requirements. (6)

By Fodor (4) quoted Bodea (1) it is estimated that approval and acceptance of a large number of varieties provide an enhanced genetic diversity. Thus, appears the possibility to choose varieties easily adapted to the production conditions and which suffer less because of unfavorable factors.

Consumer requirements evolve over time with changing production technologies and with the modification of plants growing areas due to the climatic conditions. The potato has got to be grown in areas very different from country of origin, the most obvious example is potato cultivation in countries like India or Egypt.

Galfi (5) quoted Schick treaty "Die Kartoffel" shows that success depends on 4 factors:

- various initial material suitable with the breeding objectives;
- methods to improve the selected characters;
- breeder hand as qualified and experienced;
- suitable environment to grow the plants which are under selection.

Knowledge of genetic varieties and valuing the various hybrid combinations that combines qualities of resistance to pests and diseases with agronomic qualities of tubers represents the decisive step in achieving a diverse assortment of potatoes.

The breeding process is based on a careful study of existing genetic resources, old varieties, local populations or wild species. Wild species represent invaluable sources regarding some new characters that can be introduced in the future varieties to better respond to the new requirements. A number of old varieties have some valuable characters that can be reconsidered and after carefully controlled hybridization can lead to highly successful combinations. After a rigorous selection these combinations lead to new performant varieties regarding the resistance and the cultural value.

Materials and Method

All varieties are obtained by sexual hybridation followed by individual clonal selection, according to the classical scheme of potato breeding (3, 2).

The main steps of working method were:

- establish of genitors according to the physiological and technological qualities of the tubers;
- sexual hybridization, including seedlings, vegetative populations, descendants, comparative crops (3 years

in the network of National Institute for Testing and Registration of Varieties – ISTIS);
- obtaining license and registration in the National List of Cultivated Varieties.

The resistance to black wart was determined at Pojorata Centre Suceava. The starch content and processing quality were determined in the NIRDPSB Brasov laboratory. Also resistance to late blight and viruses were determined in the fields and laboratories of NIRDPSB Brasov.

Results and Discussions

Potato variety **BRASOVIA**

Genitors: Amelia x Impala

Morphological characters: The plant is well developed, with a large number of stems. The leaf with

intermediary opening, strong presence of leaflets, dark green color. Medium size of corolla, low frequency of white flowers. The tubers are round-oval with yellow skin and white-yellow flesh. The sprouts are medium, conical, with strong anthocyanin colouration and medium pubescence of base.

Physiological characteristics: Brasovia variety belongs to the group of middle varieties with a vegetation period of 100 days.

Resistance to pests and diseases: Is middle sensitive to late blight on foliage and tubers, middle resistant to PVY and leaf roll viruses and resistant to potato wart (*Synchytrium endobioticum*).

Culinary quality : It has a good culinary quality (class A/B) and a starch content of 13,25%. This variety is suitable for a range of uses.

High yielding in a wide range of soil types.



Fig.1 Brasovia variety: leaf, flower and sprouts (photo original)

Potato variety **CASTRUM**

Genitors: Christian x Dura

Morphological characters. The plant is tall with semierect port. The leaf with intermediary opening, strong presence of leaflets, light green color. Medium to low frequency of white flowers with corolla medium to little.

The tubers are round-oval with yellow skin and pale yellow flesh. The sprouts are ovoid, with red purple strong anthocyanin colouration and low pubescence of base.

Physiological characteristics: Castrum variety belongs to the group of middle varieties with a vegetation period of 110-120 days.

Resistance to pests and diseases: Is middle sensitive to late blight on foliage and tubers, very resistant to PVY and leaf roll viruses, resistant to potato wart (*Synchytrium endobioticum*).

Culinary quality: It has a good culinary quality (class B) and a starch content of 10,25%.



Fig.2 Castrum variety: leaf, flower and sprouts (photo original)

Potato variety **MARVIS**
Genitors: Amelia x Impala

Morphological characters: The plant is well developed, with medium number of stems. The leaf with intermediary opening, absent or very low presence of leaflets, light green color. Very low to low frequency of white flowers, with little to medium corolla.

The tubers are oval with medium yellow skin and pale yellow flesh. The sprouts are medium, conical, with

strong anthocyanin colouration and medium pubescence of base.

Physiological characteristics: Marvis variety belongs to the group of middle varieties with a vegetation period of 90-100 days.

Resistance to pests and diseases: Is middle resistant to late blight on foliage and tubers and also medium resistant to PVY and leaf roll virus and resistant to potato wart (*Synchytrium endobioticum*).

Culinary quality: It has a good culinary quality (class B) and a starch content of 14,75%.



Fig.3 Marvis variety: leaf, flower and sprouts (photo original)

Potato variety **SARMIS**
Genitors: Tresor x Impala

Morphological characters: Medium to intermediate type foliage structure, stems semi-upright. The leaf with intermediary opening, absent to very low presence of leaflets, light green color. Medium frequency of white flowers.

Tubers long oval, pale yellow skin and yellowish white flesh and shallow eyes.

Physiological characteristics: Sarmis variety belongs to the group of middle varieties with a vegetation period of 100 days.

Resistance to pests and diseases: Is moderately resistant to late blight on foliage and tubers, moderately resistant to PVY and leaf roll viruses and resistant to potato wart (*Synchytrium endobioticum*).

Culinary quality: Sarmis has a good culinary quality (class A / B) and a starch content of 14,0%.



Fig.4 Sarmis variety: leaf, flower and sprouts (photo original)

Table 1

Yielding capacity in network I.S.T.I.S. (3 years average)

Variety	Yield (kg/ha)/years							Yield average kg/ha	Difference from control	
	Târgoviște	Tg. Secuiesc	Sibiu	Satu mare	Rădăuți	Hărman	Bacău		kg/ha	%
Brașovia	21515	46063	41014	31608	32394	38163	26441	33885	4385	114,86
Castrum	19082	53135	43041	31488	28383	26072	33604	33544	4044	113,71
Marvis	17439	45642	42584	23539	32040	25508	28912	30809	1309	104,43
Sarmis	17849	55261	42774	23824	26753	25424	28003	31413	1913	106,48
Magic (2011-2012) Sante (2013)	19522	42497	39871	21919	26900	24896	30897	29500	0,0	100,0

Comparing yield data obtained in network ISTIS is observed that the new varieties exceeded the control varieties, Magic respectively Sante with percent between 4.43% Marvis variety and 14.86% Brasovia variety. From these percentages can be inferred production capacity in various environmental conditions and also ecological plasticity of varieties. Is recommended cultivation in favorable areas and in thermo-hydric risk areas using irrigation system.

Culinary quality was assessed in the Technology laboratory of NIRDPSB Brasov. Based on determined attributes and the score obtained (notes for desintegration, consistency, mealiness, humidity and granulation) a variety can fit in a class of use. Class A

include firm potatoes for salad but potatoes from this class can also be used for other dishes. Tubers of this type does not shatter, remain whole, are unmealy and have a fine structure. The taste is good and starch content is low. Class B tubers are reasonably firm, suitable for most culinary preparations. At boiling shatter a little, are a little mealy, slightly moist and have a fine structure. Due to the multiple uses and good taste this kind of varieties are greatly demanded by consumers.

After the determination of defining elements of culinary quality, the varieties Brasovia and Sarmis were placed in A/B class and Castrum and Marvis varieties in B class.

Table 2

Culinary quality of varieties Braşovia, Castrum, Marvis and Sarmis compared with standard varieties Magic and Santé

Character	Braşovia	Castrum	Marvis	Sarmis	Magic	Santé	Observations
Aspect	1,5	2,5	1,5	2,0	2,5	1,5	1-very showy 4-unshowy
Taste	3,0	3,0	3,5	2,5	3,7	3,0	1-excelent 4-less good
Color	4,5	4,0	4,5	4,5	4,0	4,5	1-white 6-intense yellow
Disintegration	1,0	2,0	1,5	1,0	1,7	1,5	1-remain whole 4- hard crush
Consistency	1,5	3,0	3,5	1,5	2,4	2,0	1-firm hearty 4-unhearty
Mealiness	2,0	2,0	1,5	2,5	2,1	1,5	1-unmealy 4-very mealy
Moistness	2,0	2,0	1,5	2,5	2,7	2,5	1-moist 4-dry
Granulation	2,5	2,5	2,5	2,5	2,3	1,0	1-fine 4-very coarse
Cooking type	AB	B	B	AB	B	A/B	
Rawdiscolouration	3,0	2,0	4,0	2,0	2,5	2,0	1-uncolored 9-blackened
Starch content	13,25	10,25	14,75	14,0	15,3	15,0	

Conclusions

The need to create new potato varieties in Romania is imposed by a number of factors, like quarantine pests and diseases *Globodera sp.*, *Clavibacter michiganensis* and *Ralstonia solanacearum*.

The presence of viral infection in our country is above the pressure existing in European countries with tradition in potato culture. Varieties developed in these countries have a short life due to the degeneracy viruses.

It is important to have adapted varieties to the climatic conditions to avoid stress and physiological injuries.

The varieties Braşovia, Castrum, Marvis and Sarmis are recommended to be cultivated in favorable and very favorable areas for potato. In the thermo-hydric stress areas is recommended to use irrigation to obtain satisfying production.

The potato varieties created in the last years at NIRDPSB Brasov have a good capacity of yield and are well adapted to the Romanian climatic and soil

conditions according to the tests in the network of State Institute for variety Testing and Registration (ISTIS).

References

1. Bodea D., 2001. Magic și Astral – early varieties of potato. Scientific papers (Anale) ICPC Braşov, vol. XXVIII, pp. 18-24.
2. Bozeşan I., 2002. Potato varieties created in România. ICDCSZ Braşov.
3. Chiru S., Gorea T., Adriana Cupşa, Mureşan S., Nicoleta Chiru, Boţoman Gh., Lucreţia Pop, 1992. Potato breeding. Results and perspectives. Scientific papers (Anale) ICPC, vol. XIX, pp. 30-40.
4. Fodor I., 1982. Increase yield potential by variety. Potato, variety and seed. I.C.P.C. Brasov.
5. Galfi N., Catelly T., 1995. Potato variety „Catellyna” created to SCPC Miercurea Ciuc. Scientific papers (Anale) ICPC, vol. XXII, pp. 43-408.
6. Hermeziu R., Bozeşan I., 1994. Aspects of keeping the collection varieties to I.C.P.C. Braşov, Scientific papers (Anale) ICPC, vol XXI, pp 50-55.

Table of Contents

Mousa Solgi, Kheirola Dastyari and Ebrahim Hadavi - The Evaluation Effects of Some Vegetative Propagation Methods and Plant Growth Regulators on Bulblet Production Rate in Crown Imperial (<i>Fritillaria imperialis</i> L.)	1
Apahidean Al. S., Apahidean Al. I., Brîndușa Aniela Rusu - Research on the behavior of autumn grown cauliflower cultivars	7
Apahidean, Al. S., Chiper Lidia-Ioana, Heitz Minerva, Căpușan Janina, Apahidean Al.I. - Study of autumn cabbage cultivation in the specific conditions of Iernut area, Mures county	12
Alexe Constanta, Lamureanu Gh., Pricop Simona - Aspects regarding the vegetative multiplication of Begonia x tuberhybrida plants	16
Brezeanu Creola, Robu T., Brezeanu P. M. , Ambarus Silvica - Promoting Breeding of New Mung Bean Genotypes for Sustainable Agriculture and Food Security	21
Bunta Gh., Toma I., Gorunoiu Gabriela, Pițu S. - The relationship between genotypes, diseases attack, yield and quality in winter wheat in western Romania	24
Conțiu Ioana, Lazăr V., Gocan Tincuța, Cantor Maria - Effect of preservative solutions on morpho-decorative characters of rose cut flowers obtained in soil less culture	34
Conțiu Ioana, Husti Anca, Macavei Laura, Cantor Maria - Evaluation of Pests and Diseases Level of Some Rose Cultivars in Soil less Culture	41
Becherescu Alexandra, Horgoș A., Popa D., Hoza Gheorghîța, Crețu Ioana Alina - Study on the impact of coverage mixture recipe and of some phytosanitary products upon <i>Agaricus bisporus</i> yield, in intensive bizonal system	45
Becherescu Alexandra , Horgoș A., Popa D., Hoza Gheorghîța, Ienciu Anișoara - Study on the impact of culture substratum and fertilization system upon the productive potential of some tomato hybrids cultivated in industrial greenhouses	52
Căprariu Al. D. , Apahidean Maria, Apahidean Al. I. - Research concerning the possibility of improve the onion (<i>Allium cepa</i> L.) Culture technology by direct sowing in Transylvania	59
Enache V., Baciu A.A. - The effect of low temperatures in Southern Oltenia on fruit plants	65
Enescu C.M., Loghin C.C., Ștefan V. - Wild privet (<i>Ligustrum vulgare</i> L.): A Multipurpose Species with an important role in Forest Land Reclamation	70
Giugea N., Mărăcineanu L.C., Popa C. - The possibilities of multiple characterization of the ecological potential of a viticulture region by graphic and numerical methods	74
Dinu Maria, Soare Rodica - Researches on the sweet potato (<i>Ipomea batatas</i> L.)	79

behaviour under the soil and climatic conditions of the South-West of Romania

- Dan Cătălina, Sestras F. Adriana, Bozdog C., Sestras E. Radu** - Estimation of genetic effects implied in apple inheritance of quantitative traits 85
- Fora C.G., Zellner M., Lauer K.F., Stanciu S., Moatăr M., Berar C.** - Monitoring of six *Agriotes* click beetles in areas suitable for the installing of shelterbelts in Banat's plain region 91
- Dobrei Alina Georgeta, Dobrei A., Iordănescu Olimpia, Nistor Eleonora, Balla G., Mălăescu Mihaela, Drăgunescu Anca** - Research concerning the correlation of soil with wines quality in some varieties of wine grapes in Miniș-Măderat vineyards 98
- Dobrei Alina Georgeta, Dobrei A., Nistor Eleonora, Sala F., Mălăescu Mihaela, Drăgunescu Anca, Camen D.** - Research concerning the qualitative potential of the wines obtained from different grape-growing ecosystems 103
- Hermeziu R., Hermeziu Manuela, Stefan Floriana Maria** - New potato varieties created at the National Institute of Research and Development for Potato and Sugar Beet Brasov 108
- Iordănescu Olimpia Alina, Costea Viorica Adriana, Blidariu Aurelia, Olaru Daniela** - Researches concerning vigor of growth by some peach varieties belonging world collection to this species in pedoclimatic conditions of Timisoara 113
- Madoșă E., Velicevici Giancarla, Ciulca Adriana, Avadanei C.** - Study regarding the variability of daffodil's (*Narcissus stellaris* L.) variability from „Bătești protected area” 118
- Alda S., Alda Liana Maria, Cristea T., Gogoasa I., Nita Simona, Negrea Adina, Gergen I.** - Researches regarding the analysis by atomic fluorescence X-ray of scandium content in soil 122
- Alda S., Alda Liana Maria, Cristea T., Gogoasa I., Negrea P., Danci M., Gergen I.** - Researches regarding rubidium content in soil and plants using analysis by atomic fluorescence X-ray 126
- Alecu Anca, Botu M., Burnaz R.** - Research on the way of manifestation of the physiological elements at the *Castanea sativa* Mill identified in the North of Oltenia 130
- Borozan Aurica Breica, Dogaru Diana, Bordean Despina Maria, Moldovan Camelia, Sandoiu I., Dumbrava Delia** - Filamentous fungi variation in the soils from grasslands populated with *a. Capillaris* l from Banat`s Mountains 136
- Dămureanu Andreea Ionela, Baci A.A.** - The influence of climatic factors on the vegetation development phases of peach species (partial observations) 141
- Cosmulescu Sina, Baci A., Gruia M.** - Influence of climatic factors on the phenology spring in Southern Oltenia (Romania) 147
- Cozma Antoanela, Petcu Mihaela, Velicevici Giancarla, Cretescu Iuliana** - Evaluation of physicochemical characteristics on commercially available carrot juice and carrot juice mixed with other fruit 158
- Cîrciu D.V., Manea D.N.** - Weeding levels in grain maize 162
- Glăman, Gh., Lăcătuș, V., Scurtu, I., Vînătoru, C., Floarea Burnichi, Minerva Heitz, Aurelia Diaconu, Gicuța Sbîrciog, Silvica Ambăruș, Luminița Nicoleta Cârstea** - Eating Romanian vegetables with Romanian taste. 166

Supply with Romanian vegetable seeds in the period 2015-2020

Cârciu G., Alda S., Cristea T., Drăgulescu Anca, Turc Alina, Molnar L. - Influence of pre-emergent crop on weeding rate and crop in winter barley	176
Cadar N. - Typological framing of forest from Lunca Muresului Natural Park	181
Cadar N., Chisăliță I., Merce O., Turcu D. O., Cântar I. C., Crăciunescu A., Visoiu D. - The establishment of shelterbelt against the snow cover of national roads in Arad county	186
Beinsan Carmen, Sumalan R., Sumalan Renata - Studies on postharvest quality of some quince genotypes	193
Beinsan Carmen, Sumalan R., Sumalan Renata - The influence of storage conditions on quality in some varieties of pears	197
Buzatu Gilda-Diana, Dodocioiu Ana-Maria - Research regarding agrochemical characteristics and heavy metals content in a vineyard soil	201
Cântar I. C., Chisăliță I., Cadar N., Merce O., Turcu D. - The impact of mining activities from Moldova Noua on forests	207
Cântar I. C. - Forest plantations on the tailing dumps from Moldova Nouă – periurban forest	216
Rățoi I., Toma V., Mihaela Croitoru, Cristina Emanuela Vladu - Research on fertigation culture watermelons on sandy soils	221
Nistor Eleonora, Dobrei Alina, Dobrei A., Camen D., Mălăescu Mihaela, Prundeanu H. - Anthocyanins and phenolics in Cabernet Sauvignon and Pinot noir wines	226
Nistor Eleonora^{1*}, Dobrei Alina¹, Dobrei A.¹, Camen D.¹, Mălăescu Mihaela¹, Prundeanu H. - Red wine benefits and side effects: a Review	230
Olaru Daniela Nicoleta, Iordănescu Olimpia Alina, Blidariu Aurelia, Mălăescu Mihaela, Moatăr Mihaela Maria, David I. - The behavior of some local walnut biotypes in the Western part of Romania	234
Olaru Daniela Nicoleta, Iordănescu Olimpia Alina, Dobrei A., Dobrei Alina, Moatăr Mihaela Maria, David I. - Research upon apricot fruit quality on rod with different generative branches, under green cutting application	238