

COSIANA – NEW ROMANIAN POTATO VARIETY

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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 traits performance.

Among the achievements of National Institute of Research and Development for Potato and Sugar Beet in 2015 was registered the variety Cosiana.

The variety is obtained through sexual hybridization and individual clonal selection. As vegetation period enroll in the group of middle varieties.

Cosiana has a high yield capacity, is resistant to black wart (*Synchytrium endobioticum*), middle resistant to late blight (*Phytophthora infestans*) and to different viruses (PVY⁰ and PLRV).

The variety is conceived for autumn-winter consumption, being suitable for most culinary preparations, from salad to mash potatoes.

Key words: potato, breeding, cultivar description, yield capacity, culinary quality

Potato it is now the fourth most important world food crop, surpassed only by wheat, rice, and maize. In five centuries, this diverse and adaptable plant has spread from its original South American heartland in the high Andes to all elevation zones in temperate regions of all the continents, and, lately, its production has been increasing most rapidly in the warm, humid, tropical Asian lowlands during the dry season (Van der Zaag, 1984).

According to FAO (2008) the potato should be a major component in strategies aimed at providing nutritious food for the poor and hungry. It is ideally suited to places where land is limited and labour is abundant, conditions that characterize much of the developing world. The potato produces more nutritious food more quickly, on less land, and in harsher climates than any other major crop - up to 85% of the plant is edible human food, compared to around 50% in cereals.

Breeding work in potatoes is concerned to increased yield, to obtain resistance to pest and diseases and environmental stresses.

Approval and then introducing in production of a large number of potato varieties, means an increased genetic diversity and an opportunity to choose varieties better adapted to unfavorable factors (Bodea, 2001).

Potato breeding activities undertaken under NIRDPSB Brasov are permanently orientated to obtain varieties with high yield capacity and quality skills.

MATERIAL AND METHODS

COSIANA it's a new medium late potato variety suitable for cultivation in all traditional areas.

The variety is obtained by sexual hybridization followed by individual clonal selection, according to the classical scheme of potato breeding (Chiru et al., 1992, Bozesan, 2002).

The main steps of working method were:

- establish of genitors according to the physiological and technological qualities of the tubers (Figure 1)

- 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 Station, 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.

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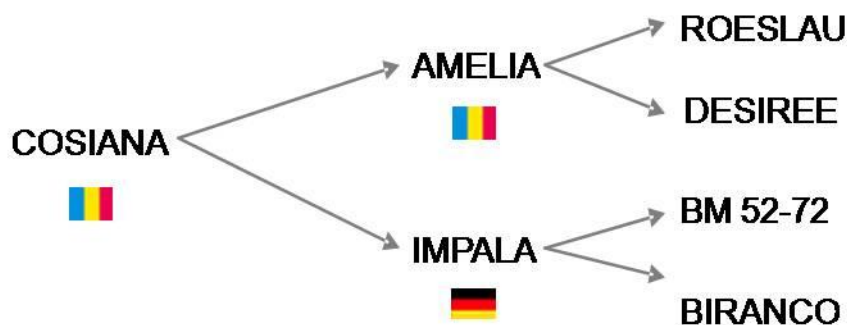


Figure 1 The genealogy of Cosiana variety

RESULTS AND DISCUSSIONS

The results obtained in ISTIS network after 3 years of examination have led to approval of Cosiana variety in 2016, currently waiting the patent.

Variety description

Morphological characteristics:

- maturity: medium
- the plant is tall to very tall, with large number of stems and erect port

- sprout has a conical shape, with a close type of growth, with strong pilosity and a medium number of rootlet (*figure 2*)

- the leaf is opening, with medium perimeter, large number of leaflets and green color

- the variety has a medium frequency of the flowers. The flower has red purple color and a large size of the corolla. Corolla has a strong anthocyanin coloration on the inner face and the proportion of blue in anthocyanin coloration on the inside is medium

- the tubers is round-oval, with medium shallow eyes, red skin and pale yellow flesh



Figure 2 Cosiana variety – tuber with sprouts, leaf and flower

Resistance to pests and diseases

The breeding program developed to the NIRDPSB Brasov imposed the restrictive condition that all clones to be resistant to potato wart (*Synchytrium endobioticum*), biotype 1, to control this extremely dangerous pathogen. According to the test performed to Pojorâta station, Cosiana variety is resistant to potato wart.

Cosiana variety is middle resistant to late blight (*Phytophthora infestans*) on foliage and tubers and also medium resistant to PVY and leaf roll viruses.

Yielding capacity

Yield is a complex heritable trait, being greatly influenced by environmental conditions and photoperiodicity.

Potato variety Cosiana proved a good yield capacity (60 t/ha), being adapted to Romanian climatic and soil conditions (Picture 2), as shown in tests carried out in ISTIS network, were it was tested prior approval (Table 1).

In ISTIS network Cosiana variety exceeded by 4 to 8% the control varieties, Sante and Redsec varieties in 2013 and Sante and Roclas varieties in 2014-2015. From these percentages may be deducted the yielding capacity in different environmental conditions and also the ecological plasticity of the variety. Evaluation was done in six centers: Târgu Secuiesc, Sibiu, Satu Mare, Rădăuți, Luduș (2014-2015), Hărman, Bacău (2013).

Table 1

Yielding capacity in I.S.T.I.S. network (2013-2015)

ISTIS station	2013			2014			2015		
	Cosiana	Sante	Redsec	Cosiana	Sante	Roclas	Cosiana	Sante	Roclas
Tg. Secuiesc	69537 (140%)	49704 (100%)	55003 (111%)	63461 (120%)	53828 (107%)	50305 (100%)	36263 (80%)	45473 (100%)	32139 (71%)
Sibiu	43756 (95%)	45955 (100%)	56208 (122%)	55601 (109%)	55060 (108%)	51242 (100%)	35887 (100%)	35815 (100%)	31258 (87%)
Satu Mare	26189 (118%)	22262 (100%)	25199 (113%)	20754 (91%)	22703 (100%)	22743 (100%)	22596 (121%)	18685 (100%)	25706 (138%)
Rădăuți	24053 (89%)	21357 (100%)	29543 (123%)	25759 (128%)	25866 (128%)	20207 (100%)	16783 (97%)	17256 (100%)	21575 (125%)
Luduș	-	-	-	45780 (123%)	43244 (117%)	37104 (100%)	28905 (96%)	30203 (100%)	33901 (112%)
Hărman	23891 (95%)	25225 (100%)	24156 (96%)	48449 (105%)	44045 (95%)	46317 (100%)	41642 (101%)	41375 (100%)	40708 (98%)
Bacău	20633 (77%)	25225 (100%)	27931 (104%)	-	-	-	-	-	-
Average	31436 (104%)	30236 (100%)	34247 (113%)	39947 (108%)	38530 (105%)	36867 (100%)	30346 (96%)	31468 (100%)	30881 (98%)



Figure 3 Cosiana variety in 2015 at NIRDPSB Brasov

Culinary quality

The variety belongs to an intermediate category (class B/C) and has a starch content of

15,75%. Cosiana variety is suitable for a range of uses, including chips and pommes frites (Table 2).

Table 2

Culinary quality of variety Cosiana compared with standard varieties Rustic and Roclas

Character	Cosiana	Rustic	Roclas	Observations
Aspect	2,5	2,5	1,5	1-very showy 4-unshowy
Taste	3,0	3,0	2,0	1-excelent 4-less good
Color	2,5	4,0	4,5	1-white 6-intense yellow
Disintegration	3,5	1,5	1,0	1-remain whole 4- hard crush
Consistency	2,5	1,5	1,0	1-firm hearty 4-unhearty
Mealiness	3,0	2,0	2,5	1-unmealy 4-very mealy
Moistness	2,0	2,0	2,0	1-moist 4-dry
Granulation	3,0	1,5	2,0	1-fine 4-very coarse
Cooking type	B/C	A/B	A/B	
Raw discolouration	2,0	3,0	4,0	1-uncolored 9-blakened
Starch content	15,75	18,85	15,75	

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 *Rastolnia solanacearum*.

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

Cosiana variety is a relatively late variety, with a high yield capacity associated with some superior agronomic property.

Very good resistance to the important viruses make possible to produce seed without much difficulty.

It is recommended to be cultivated in favorable areas and in thermo-hydric stress areas to use irrigation to obtain satisfactory production.

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

ACKNOWLEDGMENTS

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