BREEDING AND MULTIPLICATION OF ROMANIAN POTATO VARIETIES

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INTRODUCTION

Romanian potato breeding comparative with other European countries is recently, in concordance with the late introduction of this plant in the crop structure. Breeding for new potato varieties appears like a necessity of the extension of potato in different ecological zones and great importance of this plant in human alimentation, fodder and material for processing.

Potato breeding has as task the creation of new performance varieties for a determined period.

The basic objectives of breeding consist in creations of varieties for consumption and industry with high production capacity, resistant to diseases and enemies (late blight, viruses, wart diseases, nemathods) combined with superior quality.

To satisfied these requirements potato breeding is continue and long term activity with objectives in permanent progress, well determinate.

The multiple goals and the diversity of cultivation impose the multiplication of large number of varieties. To obtain free viruses material there are used different methods. The most modern with possibility for improving is the multiplication "in vitro", starting from meristems culture and from "in vitro" systems the most utilized in potato are multiplication from microcuttings, microtubers and minitubers.

MATERIAL AND METHODS

As biological material are used genitors with known heredity represented by wild species from genus *Solanum* and varieties from the species *Solanum tuberosum*. Genitors are selected function on principal characters taken in study.

Like method is used the sexuat hybridization followed by individual clonal selection. For crossing there are selected genitors with constant characters. The use of wild species to gain populations which will be selected to make retrocrossing with cultivated varieties is done to improve the cultural characters by maintaining the resistance and quality characters. Starting from reduced populations with selection percentage 25-23% it came at many populations with selection percentage 4-7%.

The seed production methodology had to consider some implications:

- regarding the vegetative multiplication the characters are transmitted unchanged to all individuals which are the results from single descent obtained from botanical seed. All plants from one variety are identical being vegetative descent of one genotype;
- by vegetative multiplication the planting material is affected by virotical infection and physiological l stress and the initial production capacity is reduced. The result of degeneration process is diminished by changing periodically the planting material.

RESULTS AND DISCUSSION

The new Romanian varieties have to answer to the international requirements regarding the yield capacity, the resistance to diseases and enemies, quality and suited for processing.

The commercial aspect and the tradition for red skin varieties are main factors in the creations of new varieties.

To improve the breeding activity it was adopted a strategy for short, medium and long term having priority objective the creation of competitive new varieties based on genetic and cytological research combine with the participation of all domains depending on these activity.

The necessity to create new varieties in Romania is impose due the following factors:

- introduction restriction for new varieties susceptible to pathogens like *Synchitrium endobioticum* which produce wart disease;
- the presence of quarantine enemies as *Globodera sp., Clavibacter michiganensis (Ring rot of potato), Ralstonia solanacearum (Brown rot of potato);*
- to create potato varieties adapted to varied climate condition to avoid stress and physiological depreciation;

- Presence of high viruses infection above the limit existing in the European countries with tradition in potato crop. The varieties created in these countries had a short life due to virotical degeneration;
- Creation of resistant varieties (especial for late blight) which can assure a good protection for environment and avoid the increasing of costs;
- Creation of potato varieties to satisfy the specific demand of clients on cultural aspect (red skin, oval shape, shallow eyes);
- Creation of potato with a good storage capacity;
- Creation of varieties suitable for industry and processing (pommes frites, chips, flakes, starch).

The performances of romanian potato varieties from the national seed potato system:

Table 1. The potential yield

Variety	DACIA	ROCLAS	CHRISTIAN	ALIZE	TAMPA	RUXANDRA
Potential yield (tones/hectare)	90,6	65,9	70,6	80,7	77,4	72,6

Table 2. Resistance to late blight and to most important potato viruses (field resistance to PVY and PLRV)

Variety	DACIA	ROCLAS	CHRISTIAN	ALIZE	TAMPA	RUXANDRA
Late blight on foliage	VS	MR	MS	MS	MS	R
Late blight to tubers	MR	MR	MS	MS	R	R
Potato virus Y (PVY)	VR	MR	MR	VR	VR	VR
Potato leaf roll virus (PLRV)	R	R	S	MR	R	R

Legend: VS – very susceptible; S – susceptible;
MS – medium susceptible; MR – medium resistant;
R – resistant; VR – very resistant.

Table 3. The main quality features

Variety	DACIA	ROCLAS	CHRISTIAN	ALIZE	TAMPA	RUXANDRA
Skin color	y	y	r	r	y	Y
Flesh color	y	y	y	y	y	Y
Eye dept	S	MD	VS	MD	MD	MD
Tuber shape	o	o	o	ro	o	O
Starch content (%)	16,0	17,0	16,5	20,0	16,5	21,5
Destination	1	2	1	3	3	4

Legend: Skin color: y – yellow; r – red.
Flesh color: y – yellow.
Eye depth: VS – very shallow; S - shallow; MD – medium to deep.
Tuber shape: o – oval; ro – round to oval.

1. Early and summer consumption.
2. Early and summer consumption and processing (chips).
3. Autumn and winter consumption and processing (starch).
4. Processing (chips and starch).

Neglecting the breeding activity had bad implications, especially by introducing new diseases and enemies through some varieties not adapted which can create an ecological lack of balance. The Romanian varieties created in specific conditions respond very well in western Europe due the suited for processing (Ruxandra, Tampa, Alize) but more in East and South-East Europe existing big possibilities to extend them in these countries especial the early varieties (as Dacia, Christian, Roclas).