STUDIES ON MULTIPLICATION OF POTATO PLANTING MATERIAL FROM SUPERIOR CATEGORIES UNDER FREE CONDITIONS OF VIROSES

STUDII PRIVIND ÎNMULȚIREA MATERIALULUI DE PLANTAT LA CARTOF DIN CATEGORII SUPERIOARE ÎN CONDIȚII LIBERE DE VIROZE

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Abstract: *Because the production of potato planting material can not practically ensure the entire material required for seed of an area or a country from economic considerations – a very large volume of specific works influence the cost of production of seed tubers up to unprofitable values - the only acceptable way of an economic perspective for high maintaining of production potential and phyto-sanitary standard is the re-propagation of planting material in a number of years with respect to specific technical and organizational measures to prevent the virus infections.*

Rezumat: *Datorită faptului că producerea materialului de plantat la cartof nu poate asigura în mod practic întregul necesar de material pentru sămânță al unei zone sau al unei țări, din considerente de ordin economic – volum foarte mare de lucrări speciale le influențează costul de producție al tuberculilor pentru sămânță, până la valori nerentabile – singura cale acceptabilă din punct de vedere economic de menținere ridicată a potențialului productiv şi a standardului fitosanitar o constituie reînmulțirea materialului de plantat la un număr de ani, cu respectarea unor măsuri tehnice şi organizatorice speciale de prevenire a infecțiilor virotice.*

Keywords: *potato, seed, potentially productive, standard, phyto-sanitary, re-propagation*
Cuvinte cheie: *cartof, sămânță, potențial productiv, standard, fitosanitar, reînmulțire*

INTRODUCTION

The multiplication of planting material is made in specialized firms in appropriate ecologic and organizational conditions.

This work is based on maintaining a lower level of virus infections, especially serious viral diseases of potato caused by leaf rolling virus and potato's Y virus.

The phyto-sanitary quality of potato planting material is caused by the virus infection level, for which a very important aspect in obtaining an appropriate planting material is to maintain a low level of them.

To prevent a virus infection in potato culture, we need to act on the two main causes that lead to it: sources of virus infection and vectors of viruses.

MATERIALS AND METHODS

The most straightforward way to follow is the production and multiplication of potato planting material in areas where at least one of these causes is naturally eliminated or is easily maintained at a very low level. These areas are most favorable for this activity, but they are restricted both in number and as surface. In Europe these areas include a band that starts in Northern France and continues into Belgium, Holland, Germany and Poland to the Baltic countries. The advantage of these areas lays primarily in the weak spread of vectors insects due

to winds, which blow from sea. In Romania these areas are located in mountain areas at altitudes above 900 m with natural conditions of isolation, with no sources of infection and host plants for vectors insects (MAN and col., 1987, MORAR, 1994).

Taking account of those presented above, we organized an experience regarding the growth of potato planting material from superior biological categories-basic-in free conditions of viroses - Păltiniş - 1420 m altitude.

The degree of viroses infection determined in the parcels of this experience coming from seed tubers brought from closed areas (Table 1) fall within the limits of certification for the specific organic production, regarding the total percentage of serious viroses and the percentage of light considered viroses:

Table 1

The degree of virus infection of potato plants from certified organic category produced by multiplication given the conditions in Păltiniş

Variety	Păltiniş			
	total	ras.fr.	xS	ym
1. Ostara	2.6	0.8	1.8	0.0
	2.4	0.6	1.8	0.0
2. Timp.de Bv	2.8	1.0	1.8	0.0
	2.0	1.2	0.8	0.0
3. Runic	1.8	0.6	1.2	0.0
	2.2	0.8	1.4	0.0
4. Robusta	1.8	0.6	1.2	0.0
5. Tempting	1.8	0.6	1.2	0.0
6. Dacia	1.1	0.3	0.8	0.0
7. Desiree	1.1	0.3	0.8	0.0
	2.0	1.1	0.9	0.0
8. Sante	1.8	0.6	1.2	0.0
	1.9	0.8	1.1	0.0
9. Nicoleta	2.3	0.5	1.8	0.0
	2.1	0.6	1.5	0.0
10. Amelia	2.9	1.0	1.9	0.0
11. Rozana	0.8	0.4	0.4	0.0
12. Productive	2.8	1.0	1.8	0.0

The material was produced within ICDCSZ Braşov, at corresponding quality indices, which were maintained in post-culture as well in the experience of material breeding, held in Păltiniş at 1420 m altitude – a most favorable area for conducting such activities, where aphides flights were reported, but very late – at the end of August, after vegetation ending, by not influencing the phyto-sanitary quality of plant tubers (IAGĂRU, 2005).

In this context, in the three experimental years for multiplication of potato planting material in the biological category - basic – deriving from closed areas, were not reported virus plants at the control performed on field. This material multiplied in Păltiniş was lowered to 400 m and multiplied in the agricultural area of Avrig city.

RESULTS AND DISCUSSION

On the territory of our country, the very favorable areas for multiplication of potato planting material are limited and because of the temperate continental climate are created favorable conditions for development of aphides. Maintaining a low percentage level of virus infections is difficult to achieve, and the efforts in this regard should be directed both on the sources and vectors.

Measures for maintaining virus infections at a lower level are different depending on the mode of viruses' transmission.

Once established the measures for preventing virus infections, was organized an experience for multiplication of potato planted material outside closed locations for the area of propagation of Sibiu county and not only.

Along with these restrictive measures in terms of producing virus infections there have been studied also experimental factors with technological character:

- potato varieties of different growing seasons (early, half-early, half-late)
- interruption of the vegetation period after a certain number of days.

To have a clear picture of the real possibilities for multiplication of potato planted material in the conditions of Avrig city an experience was organized in this regard with biological material-free of viruses coming from Păltiniş.

Table 2

The degree of virus infection of potato plants from certified organic category produced by multiplication for one year in conditions of Avrig

Variety	Avrig			
	total	ras.fr.	xS	ym
1. Ostara	1.8	0.6	1.2	0.0
	2.2	0.4	1.8	0.0
2. Timp.de Bv	1.3	0.7	0.6	0.0
	1.2	0.4	0.8	0.0
3. Runic	1.2	0.4	0.8	0.0
	0.8	0.2	0.6	0.0
4. Robusta	0.8	0.2	0.6	0.0
5. Tempting	1.3	0.5	0.8	0.0
6. Dacia	0.0	0.0	0.0	0.0
7. Desiree	0.8	0.2	0.6	0.0
	0.0	0.0	0.0	0.0
8. Sante	1.1	0.3	0.8	0.0
	0.9	0.3	0.6	0.0
9. Nicoleta	1.4	0.6	0.8	0.0
	2.6	0.8	1.8	0.0
10. Amelia	2.1	0.9	1.2	0.0
11. Rozana	2.2	0.4	1.8	0.0
12. Productive	0.8	0.2	0.6	0.0

After determination, in the experimental field organized in Avrig, of the degree of viroses infection in the plots for multiplication of potato planting material - certified biological category (Class A) - (Table 2) results the fact that it falls within the limits mentioned in

certification standards for this category in terms of total percentage of serious viruses and the percentage of mild considered viroses.

The results obtained are distinguished by the absence of potato Y virus, a small percentage of the amount of serious viroses that is situated at the threshold of acceptability at a single parcel, with the variety of *Timpuriu de Braşov*.

The following year, in the experimental field set up with material free of viruses coming from Păltiniş, the degree of infection is similar to that in the previous year indicating that from the general way of virus infection make exception two parcels where the viroses infection degree (VRFC) is sensitively bigger, one at the variety of *Timpuriu de Braşov* and the other at the *Desirée* variety.

Regarding the determination, in the experimental field organized in Avrig, of the degree of viroses infection in the plots for multiplication of potato planting material - certified biological category (Class A) - (Table 2) is shown the fact that it falls within the limits mentioned in certification standards for this category in terms of total percentage of serious viroses and the percentage of viroses considered mild.

One can also observe that in this city the degree of infection with viroses in plots coming from tubers brought from the field in Păltiniş is appropriate.

CONCLUSIONS

The variety of planted potato is important due to its sensitivity to viroses or its anatomical characteristics that may foster or impede the deep stings in leaves' phloem and thus the inoculation of persistent viruses.

The results presented in this work show that through application of technical and organizational rigorous measures under certain conditions, planting material of organic category class A and B can be obtained outside closed areas, appropriate to actual regulations for the certification of seed potatoes with a production capacity comparable to that of closed areas.

Currently, the production of seed potato from biological category *Certificated* is only held in counties with closed areas, but it is imperative that other counties as well should focus their researches on the organization of specialized areas (closed micro-zones) to obtain in mountain and hilly areas the seed potato from biological category *Certified* - Classes A and B.

The multiplication of seed potato outside closed areas has a series of economic benefits, both for traditional closed areas, and for counties that organize and put into practice such activities.

Obtaining the biological category class B, outside closed areas in the county of Sibiu is the solution for ensuring the needs of seed potato in the entire influence zone of the county and it creates the prerequisites for increasing the production through widespread use on planting of biological category class B in potato crops for consumption.

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