

USING *IN VITRO* TECHNIQUES FOR PRODUCTION OF FREE OF DISEASES POTATO MINITUBERS

Chiru N., Chiru S.C., Ivanovici D.E., Nistor A., Bozeşan I.

National Institute of Research and Development for Potato and Sugar Beet
Braşov, Romania, 500470, Fundăturii 2

INTRODUCTION

The cultivar, as biological resource, is one of the most important factor in realization of big production, constantly and economically, but like any product has a short period of economical efficiency. Biological degeneration, moral depreciation, pathogens appearance and evolution, modification of technical and economical conditions, market demands, are main elements which conditionate the maintenance in production for shorter or longer time.

Genetically, physiologically and agro-technical particularities of the potato impose with necessity the assurance of a phyto-sanitary corresponding plant material, for all the country cultivated aria. The assurance of such a material is imperiously necessary, because in the past 10 years in Romania, from 275,000 – 280,000 ha cultivated with potato, the varieties with potential (genetic resistance to viruses and mildew), which needs less treatments against aphids, mildew, Colorado beetle, are not representative, and average production obtained is 12 – 14 to/ ha, below the European standards (36,5 to/ ha) (Chiru, 2005). It is essential to modernize the potato production using *in vitro* plantlets. This method is relevant, because it pursues identification and resolving of some fundamental problems, having as goal the improvement of the conventional method of producing seed potato and consequently the improvement of *in vitro* multiplication method of potato cultivars suitable for a durable agriculture to the Romanian conditions: cultivars with genetic resistance to viruses and mildew, which needs less treatments against diseases and pests, cultivars more tolerant to hydro-thermic stress, cultivars with high water and fertilizers coefficient (Tican et. al., 2008).

In vitro propagation of potato using *in vitro* obtained tubers or *in vitro* plantlets which produce minitubers in greenhouses, is the most used method in potato seed production program in Romania. The obtained minitubers represents pre-base or base seed which can be directly planted in the field. Using minitubers in this program reduces the time to produce free of diseases potato seed (Rusu et. al., 2008; Bozesan et. al., 2008).

The goal of this research is to compare the influence of planting mode (pots or directly in soil) on minitubers size and number.

MATERIAL AND METHOD

As biological material we used two Romanian cultivars, Roclas and Christian and Dutch cultivar Ostara. Free of viruses initial material was obtained by meristem culture using the known method. After regeneration, the plantlets were tested with ELISA test for six most important known potato viruses: PLRV, PVY, PVA, PVM and PVX, *in vitro* and in the greenhouse. *In vitro* plantlets were planted in insect-proof greenhouse, directly in soil on parapets and in pots, 200 plantlets/ m², in a mix soil, manure and sand, proportion 1:1:1. The harvest has made after 95 day from planting.

RESULTS AND DISCUSSIONS

The analyses of variance of number of harvested tubers, shows a significant difference of the plantlets grown directly in soil (486 minitubers of Roclas cultivar, 524 minitubers of Christian cultivar and 594 minitubers of Ostara) compared with ones cultivated in pots (124 minitubers of Christian cultivar, 182 minitubers of Roclas cultivar, 183 minitubers of Ostara cultivar) (Fig.1)

Tubers size is also influenced by planting mode. To cultivars planted directly in soil the percent of big tubers formation is between 21 – 27 %, comparing with the cultivars planted in pots (6 – 18,9 %) (Fig.2)

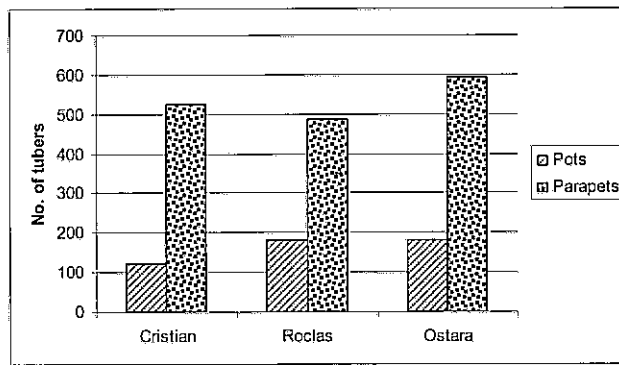


Figure 1. Minitubers obtained from the three cultivars planted in pots and directly in soil on parapets

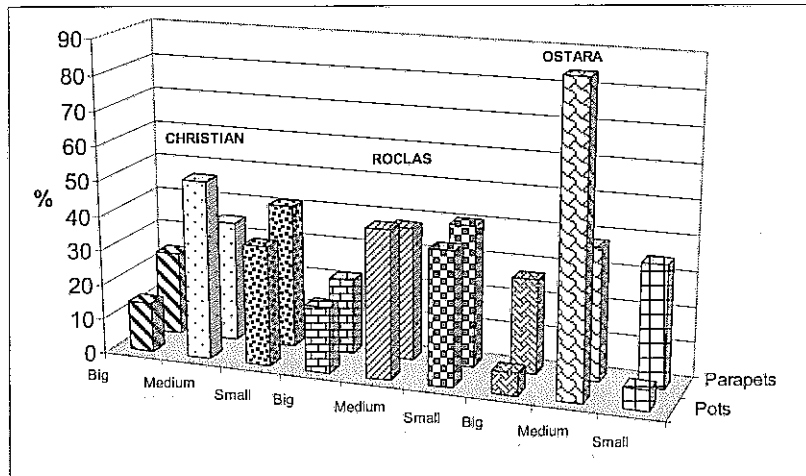


Figure 2. The structure on size of planted cultivars

CONCLUSIONS

The obtained data shows that the plants resulted from potato micropropagation process planted in greenhouse directly in mixed soil can be used for rising production quality of potato minitubers and also utilize them on large scale in seed potato production program.

REFERENCES

- Bozeşan I., Hermeziu R., Chiru N., Rusu S.N., Bădărău C.L., 2008. Modern system for varieties creation and seed production in Romania. 17thTriennial Conference of the European Association for Potato Research, EAPR 2008, July 06-10.07.2008, Braşov, Romania. Editura Universităţii Transilvania din Braşov-editură acreditată de CNCIS, adresa nr.1615/29.05.2002. pag.344-347.
- Chiru S., 2005 – Producerea cartofului pentru samanta in contextul integrării Romaniei in U.E.. In: Cartoful in Romania , vol 15 nr1,2,1-2.
- Rusu S.N., Molnar Z., Chiru N., Bădărău C.L., 2008. Technological solution of cultivation and phytosanitary control, economical efficiently, used for production prebasic clonal material to potato, 17thTriennial Conference of the European Association for Potato Research, EAPR 2008, July 06-10.07.2008, Braşov, Romania. Editura Universităţii Transilvania din Braşov-editură acreditată de CNCIS, adresa nr.1615/29.05.2002. pag.324-331.
- Tican A., Chiru N., Ivanovici D.E., Sand C., 2008. Behavior of romanian potato varieties Christian and Roclas on microtubers production. 17thTriennial Conference of the European Association for Potato Research, EAPR 2008, July 06-10.07.2008, Braşov, Romania. Editura Universităţii Transilvania din Braşov-editură acreditată de CNCIS, adresa nr.1615/29.05.2002. pag. 562-565.