RESEARCH ON THE PRODUCTION ELEMENTS IN SEED MATERIAL IN THE MOUNTAIN-HILL AREA OF SIBIU

CERCETĂRI PRIVIND ANALIZA ELEMENTELOR DE PRODUCȚIE LA MATERIALUL ÎNMULȚIT ÎN CONDIȚIILE ZONEI COLINAR-MONTANE A SIBIULUI

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Abstract: *Mass multiplication of seed potatoes may be achieved in specialized areas or farms, outside the traditionally closed areas, and is based on maintaining a low level of viral infections, especially the dangerous ones, caused by potato leaf roll virus and Y virus. In our country the seed potato renewal is made on a very limited extent. This is due to many causes, especially the economical and managerial ones. Considering also the fact that we carry out our activity in a hill-mountain area (South-East of Transylvania) where whether is colder and with heavier precipitations, providing very favourable conditions for potato cultivation, we intend to emphasize the area's potential for the organization of potato production and multiplication, thus helping the farmers.*

Rezumat*: Obținerea înmulțirilor în masă la cartoful pentru sămânță se poate realiza și în zone sau ferme specializate de înmulțire, în județe din afara zonelor închise tradiționale și se bazează pe menținerea la un nivel scăzut al infecțiilor virotice, îndeosebi a virozelor grave ale cartofului, cauzate de virusul răsucirii frunzelor și virusul Y al cartofului. În țara noastră reînnoirea cartofului pentru sămânță se face într-o proporție foarte mică. Acest fapt se datorează multor aspecte, dintre care subliniem cele economice și organizatorice. Ținând cont de aceasta și de faptul că ne desfășurăm activitatea într-o zonă colinar-montană (sud – estul Transilvaniei), unde climatul mai răcoros și cu precipitații mai bogate creează condiții foarte favorabile culturii cartofului, ne-am propus să evidențiem potențialul zonei pentru organizarea producerii și înmulțirii cartofului pentru sămânță, venind astfel în sprijinul fermierilor..*

Key words: *production, viral infection, resistant varieties, altitudes, multiplication microzones*
Cuvinte cheie: *producție, infecție virală, soi rezistent, altitudine, microzone de înmulțire*

INTRODUCTION

Considering the importance of the potato crop in the Sibiu area and neighbour regions, as well as the producers tradition we have drawn our attention in research to solve aspects as:

- providing the complete need of seed potatoes from virus free areas;
- promoting for cultivation Romanian varieties;
- improving the zoning of potato varieties according to their resistance to climatic and virotic degeneration.

MATERIALS AND METHOD

According to the fact that a profitable crop needs the choice of an appropriate variety (BOZEȘAN, 2000) we chose:

- 9 new Romanian potato varieties: Robusta, Rozana, Runica, Timpuriu de Brasov, Amelia, Nicoleta, Productiv, Tentant, Dacia;
- 3 older potato varieties, imported and due to qualities still maintained in growing: Ostara, Sante, Desiree;

- as witness to comparing results, we decided for the average rate of the experience.

The experiments conducted in order to analyze the main factors in determining the phytosanitary and biological value for the planting material we applied completely the technology for cultivating the seed potato and we strictly observed the following technological links:

- the base was the biological category of the planting material for each variety;
- planting has been operated as early as possible;
- density of planting was 65000 plants/ha (70X22 cm);
- the size of the tubers used for planting was homogeneous (45-55 mm).

In order to analyze the possibility of obtaining outside the closed areas of potato planting material with correct phytosanitary and biological value, we organized an experiment in three locations as follows: the base biological category material produced at Braşov is propagated in the agricultural are of Avrig and Sibiu for a period of time of two years in order to obtain the biological categories class A and class B that will constitute the planting material for the farmers.

During the experiment we also observed:

1. The evolution of aphids in seed potato crops in the fields: Păltiniş, Avrig, Sibiu;
2. Researching the possibilities of seed potato propagation outside the closed areas.

RESULTS AND DISCUSSION

Diagram of the Structure of the Obtained Production in the Experiment Field of Păltiniş

The structure of the obtained production in the experimental field of Păltiniş for the year 2001 shows that all the experiment varieties including all species behaved well in the potato planting material propagating process (fig. 14). Analysing the results (fig. 15) for later species in the three years of experiment it is evident that production is determined by the amount of seed tubers followed by tubers with a diameter bigger than 55 mm and is less determined by the tubers below standard.

Diagram of the Percentage of Seed Obtained in the Experiment Field of Păltiniş

The percentage of seed obtained in the year 2001 (fig. 16) doesn't show significant differences in the species comprising 57,4% (Ostara) and 64,6% (Timpuriu de Brasov). In 2002 the percentage of obtained seed kept at a favourable level between 56,6% (Runica) and 70% (Dacia). The same is true for 2003 with the exception of Tentant with a percentage of seed less than 50%.

The obtained results concerning the percentage of seed with later species show the same capacity in the context of a specific technology to form an important percentage of seed tubers (fig. 17.).

Results Obtained in Analyzing Productivity Elements of the Păltiniş Material Propagated in Sibiu and Avrig in 2002

The analyses of the results of the two places have been done by comparison of the productivity elements, of total yield, of total number of tubers, of fractions and of percentage of seed:

Diagram of the Yield Structure in the Experiment Field in Sibiu and Avrig

Yield structure in the fields Sibiu and Avrig in 2002 and 2003 shows a similar good behaviour of all the experimented species in the propagation process of the potato planting material (fig. 18).

Results analyses walk the same pass described earlier with special evidence for high productivity rates for the Sante, Nicoleta, and Amelia species (fig. 19).

Diagram of the Percentage of Seed in the Field of Sibiu and Avrig

For the early species in 2002 in Sibiu the percentage of seed is over 55% excepting Ostara (fig. 20).

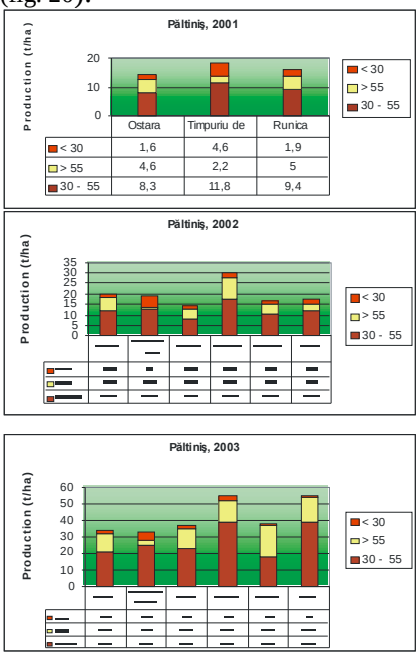

Fig. 1 4. Structure of production obtained with early species in Păltiniş 2001- 2003

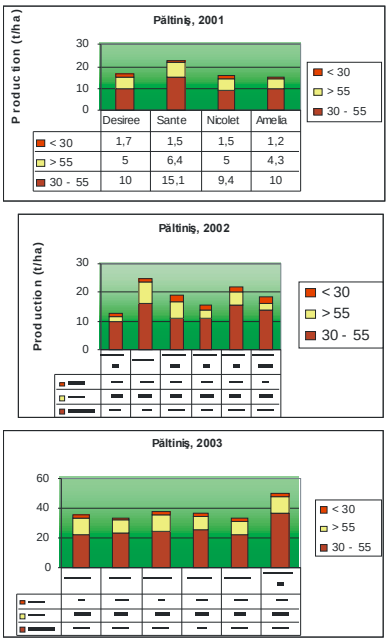

Fig. 15. Structure of production obtained with later species in Păltiniş 2001 - 2003

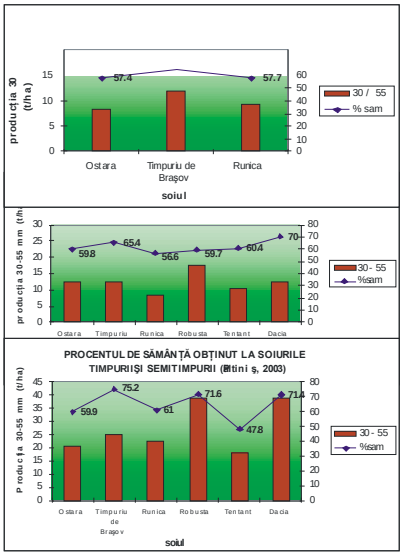

Fig. 16. Percentage of seed obtained with early species in Păltiniş 2001-2003

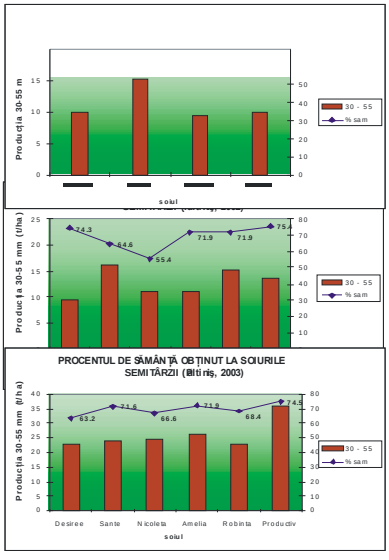

Fig. 17. Percentage of seed obtained with later species in Păltiniş 2001-2003

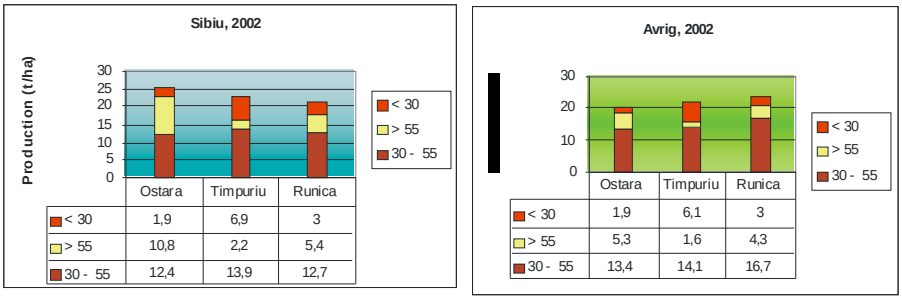

Fig. 18. The yield structure for early in Sibiu and Avrig 2002

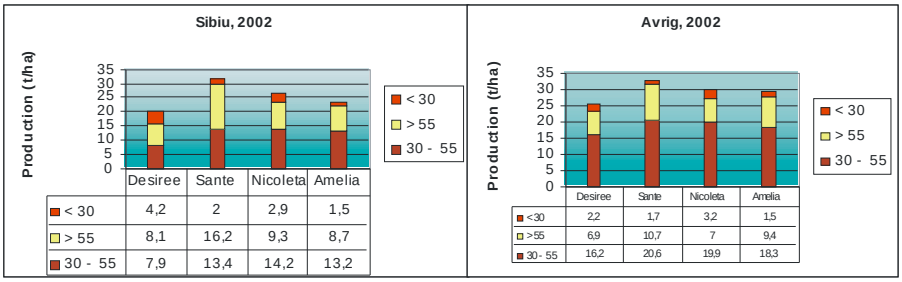

Fig. 19. Yield structure for later species in Sibiu and Avrig 2002

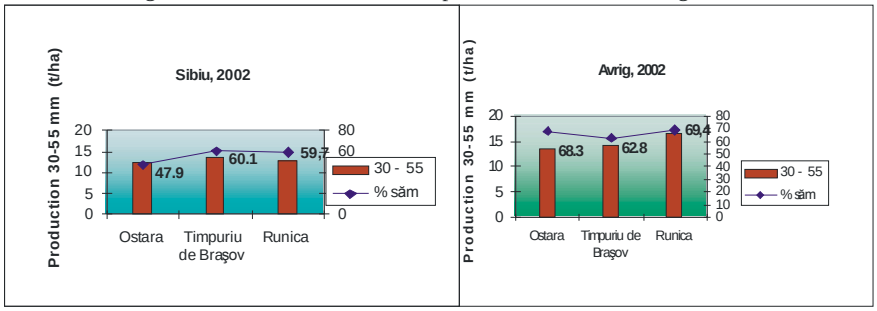

Fig. 20. Percentage of seed for the early species in Sibiu and Avrig in 2002

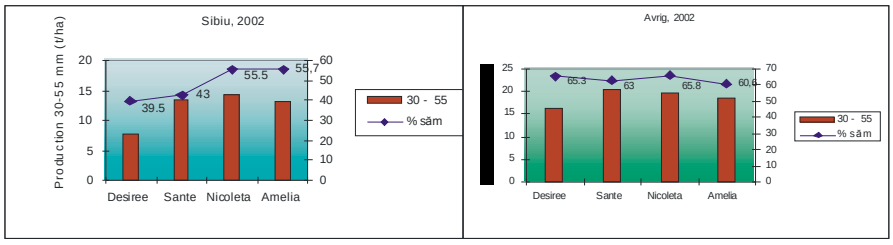

Fig. 21. Percentage of seed for the later species in Sibiu and Avrig in 2002

Significant differences between species have been registered for the later species in 2002 in Sibiu (fig. 21).

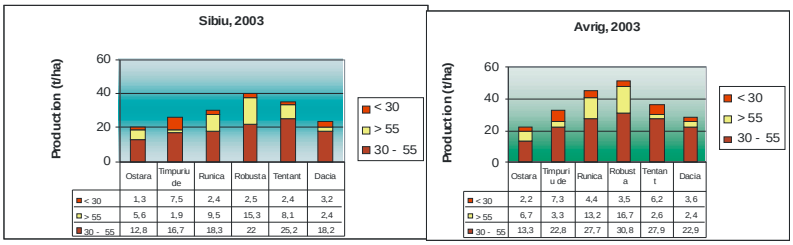

Fig. 22. Yield structure for early species in Sibiu and Avrig for 2003

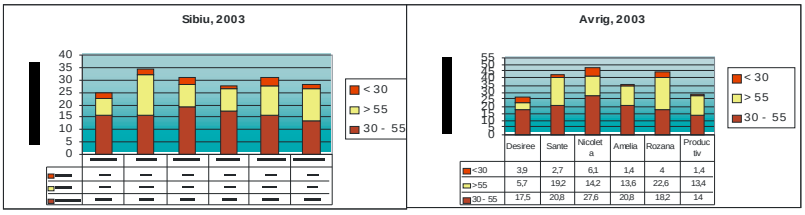

Fig. 23. Yield structure for later species in Sibiu and Avrig for 2003

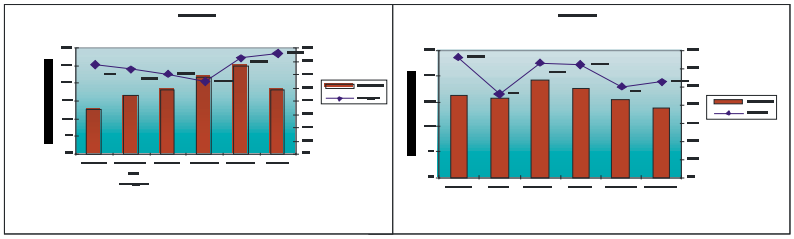

Fig. 24. Seed percentage for early species in Sibiu and Avrig 2003

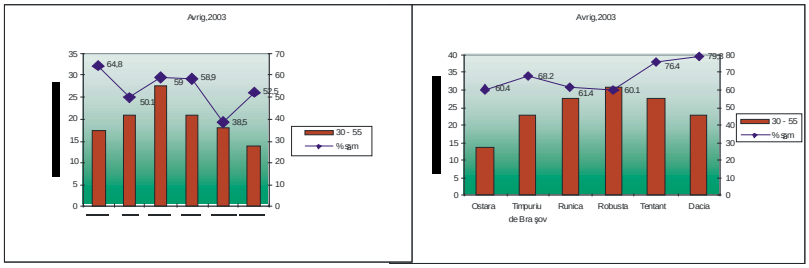

Fig. 25. Seed percentage for later species in Sibiu and Avrig 2003

Results of Productivity Analyses of the Păltiniş Material Propagated in Sibiu and Avrig in 2003

The analyses of the results in the two places in 2003 have been done by comparison of productivity elements of Sibiu and Avrig.

Diagram of Yield Structure in the Experiment Fields Sibiu and Avrig

The results of 2003 concerning the Păltiniş material show for Sibiu a yield structure that is mostly determined by the seed tubers with significant differences between the analysed species (fig. 22).

The results for later species follow the earlier presented trend. The Sante, Nicoleta, Robinta, Productiv, Amelia species can be named for their high productivity rates (fig. 23).

Diagram for Seed Percentage in the Experiment Fields in Sibiu and Avrig

The seed percentage for early species in 2003 in Sibiu show rates over 55% excepting Ostara (fig. 24). As for later species in 2003 in Sibiu there are significant differences between species (fig. 25).

CONCLUSIONS

Lately, the necessity arose for creating specialized species according to use groups. Thus the need to select species with a great number of tubers, Timpuriu de Brasov and Nicoleta; species that are industrialized and require equal shaped tubers, but also species with big size tubers very asked on the market (Amelia, Robusta);

According to productivity result analysis for all the varieties experimented at Păltiniş, Sibiu and Avrig the conclusion is positive with special mention of Robusta, Dacia, Ostara and Tentant for early species and Sante, Productiv, Robinta, Amelia, Nicoleta for later species;

The Romanian potato varieties have a high biological production capacity given by the existing equilibrium between the number of tubers and their size, characteristics usually in a negative balance (small tubers and many or the reverse);

Referring to seed percentage from the three experiment fields we mention positively Timpuriu de Brasov, Dacia, Robusta and Ostara for early species and Sante, Amelia and Productiv for later species;

At Păltiniş – 1420 m in the virus free area could be organized the production and propagation of the biological category Class B seed potato on a 3 ha surface that could be increased;

Biological category Class B can be produced in the low area o Sibiu county (Avrig – 420 m) in favourable climatic conditions, moisturized and chilly, on a 55 ha surface on fields with highly favourable for potato growing;

Providing the need for seed potato on local basis for the whole potato cultivated surface in the county of Sibiu expensive would be reduced and important savings would be made each year.

BIBLIOGRAPHY

1. BÎLTEANU GH., " Fitotehnie, vol. II "., Editura Cores, Bucureşti, 1993.
2. BLACKMAN R. L., EASTOP W. F., "Aphid in the World's Crops. An Identification Guide John Wiley and Son Chichester", London, 1985
3. BOZEŞAN I., "Soiul – factor important în realizarea unor producţii mari în condiţii de irigare", 2000, Rev."Cartoful în România",nr.3,vol. 10;
4. BOZEŞAN I., "Cultura cartofului în zonele de munte", 2003, Revista "Cartoful în România", nr.3, vol. 13, 13-16
5. BUIUC M., "Estimarea radiaţiei solare pe teritoriul României în Studii şi Cercetări – Fundamentarea meteorologică şi hidrologică a resurselor energetice neconvenţionale", Institutul de Meteorologie şi Hidrologie, Bucureşti, 1984.
6. DRĂGULESCU, C., - Cormoflora judeţului Sibiu, Editura Peleanus, Braşov, 2003
7. GOREA T., CATELLY T., MAN S., GROZA H., DRAICA C., Contribuţia soiului şi a materialului de plantat la creşterea producţiei de cartof, 1982, Buletin Informative A.S.A.S., vol. 15.
8. IAGĂRU, P., PSENICICA S., IAGĂRU, R., - Sistemul producerii şi reînnoirii cartofului pentru sămânţă în judeţul Sibiu", Lucrările Conferinţei "Ştiinţe, procese şi tehnologii agro-alimentare", Ed. Univ. Lucian Blaga, Sibiu, 2002.
9. IAGĂRU POMPILICA, IAGĂRU ROMULUS „*The management of implementing quality devices in producing potato seed material in montain and submontaine regions of Romania"* Conferinţă internaţională Eficienţă, Legalitate, Etică în Economiile Postaderare Lucrările celei de a XVI-a sesiune de comunicări Alma Mater Sibiu ISBN 973-632-312-9, 978-973-632-312-6, 2006.
10. IAGĂRU POMPILICA, „Cercetări privind producerea de material de sămânţă la cartof în condiţii de zone libere de viroze" Teză doctorat Universitatea din Craiova, 2005.