Nemere variety - result of potato breeding research at Station for Research and Development of Potato Targu Secuiesc

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Abstract Potato, from the breeding point of view, presents the following biological physiological specific features: vegetative multiplication, heterogeneity of progenitors’, large plasticity, sterility, incompatible to hybridization, excessive sensibility to diseases. The first three specific features advantage the breeding process on a large scale, but the last two thus complicates the breeding activity and constitutes important problems to success.

The breeding of potato has as permanent objective the obtaining new varieties with high yield capacity, with high resistance to diseases and pest, with high quality, which have to give the satisfaction to consumers.

The creation of new potato varieties is a continue process, which has to take into account the change of ecological conditions, with increase of aggressively and pathogenity of diseases and pest, apparition of rases, stems, brotypes, pathotipes, as well as the continue increasing of consumers demands.

The variety is a main resource for increasing the yield, without supplementary costs and energy [1].

But, each variety, as any other biological material or production equipment, has a confined time and biological degeneration with a normal wear, according to pathogens evolution, change of climatically, technical and economical condition, as well as the demand of market [6]. To give satisfaction with priority to continuously demand of consumers and producers, potato breeding is a permanent activity, of long standing, with objectives in a permanent progress, well established, which have to be satisfy by genetics’ and breeders in the new creation [7].

The yield capacity, as hereditary feature, is very complex, having a great influence by climate and photoperiod [5, 8].

The precociousness is considered recessive by genetics’, having a strong correlation with yield capacity and it is conditioned by a large number of polymers genes [4].

The dry matter content, respectively starch, is a hereditary feature, which has a strong influence by geographical and agrotechnics conditions. This feature is polyfactorial, dominant. The hybride clones are heterozygote and those with high content of starch can be selected [2, 8, 9].

The potato breeding activity at the Research and Development Station for Potato – Targu Secuiesc, Covasna County, have been started since 1987, with very definite objectives, which give the possibility of homologation of 11 potato varieties, from which 8 varieties have breeding licenses [3].

In this paper is presented the methodology of obtaining, description of Nemere variety with destination for autumn-winter consumption and industrialization and specific production technology for autumn-winter consumption and industrialization.

Material and Research Method

All varieties are obtained by sexuat hybridization followed by individual clonal selection, according to the classical scheme of potato breeding – 12 years [3].

The main steps of working method were:
- established of genitors according to physiological and technological qualities of tubers with destination for processing;
- sexuat hybridization, followed by all steps: seedlings, vegetative populations, descendants, comparative crops for completion (3 years in the network of research units and 3 years in the network of National Institute for testing and Registration of Varieties / ISTIS) and selection for maintaining in the field of clonal selection on over 1000 m a.s.l. (Apa Rosie);
- homologation, obtaining license and registration in the National List of Cultivated Varieties.
**Gared** variety has a high yield capacity, have a starch content over 18%, are resisting to potato cyst nematodes (*Globodera rostochiensis*), and black wart (*Synchitrium endobioticum*) and viruses. The starch content and processing quality were determined in the laboratories of S.C.D.C. Targu Secuiesc, resistance to potato cyst nematodes at Fagaras Centre, resistance to black wart at Pojorata Centre Suceava and resistance to viruses at virology Laboratory (I.N.C.D.C.S.Z. Brasov).

**Results and Discussions**

*Nemere* potato variety was created at S.C.D.C Tg. Secuiesc, and homologated in 1999 and is patent pending.

**Genealogy of variety Gared:** M.P.I. 61-516-20 X CERTO

**Morphological characters:** the plant is vigorous with a large number of stems and belongs to foliage type. The leaves have a medium size with light – green color. The flowers have a medium size, having a violet color with white points. The tubers have a round shape with shallow eyes. The color of skin is yellow and the color of flesh is yellow. The sprouts have a conic shape with middle size and red – violet colors on the base of sprouts.

**Vegetation period:** *Nemere* variety belongs to the group of late varieties, with a vegetation period of 85 - 100 days.

**Yielding capacity:** it is a high-yielding potato variety with a yield of over 43.5 tones/ha.

**Culinary quality:** is good and belongs to C class.

*Nemere* variety is recommended for autumn - winter consumption and industrialization. The content of starch is over 20%.

**Resistance to diseases and pest:** *Nemere* variety is middle-tolerant to late blight on leaves and tubers, is resisting to leave roll virus (PLRV) and to virus (PVY). It is resisting to potato cyst nematodes (*Globodera rostochiensis*) and black wart (*Synchitrium endobioticum*).

![Nemere variety - field, sprout and tubers](image)

Fig. 1 *Nemere* variety - field, sprout and tubers
Specific production technology for autumn-winter consumption and processing of the Nemere potato variety

Main characteristics:

**Basic fertilization:**
- for a production of 25-30 t/ha (if humidity is ensured), the orientative dosage of N, P₂O₅ respectively K₂O applied in spring is 160-180 kg/ha s.s, 100-130 kg/ha s.a., respectively 150-200 kg/ha s.a. The variety reacts well to the fractionated administration of nitrogen in spring, 1/3 at planting, 2/3 at re-riding.

**Preparation of the germinative bed:**
- after a deep tillage (30-35 cm) in autumn, unfurmed, the following works will be carried out: in spring, after leveling the tillage, works will be carried out at a depth of 10-12 cm (on shallow compact soils), respectively 16-18 cm (soils worked deeply). All works will be carried out in conditions of optimal soil moisture.

**Planting**
- planting starts when soil temperature reaches 6-8°C, the planting depth is 3-6 cm (depending on the size of the planting material). The planting density is 53,300 holes/ha, and the distance between rows is 75/25 cm. The size of the ridge at planting is from small to medium-sized, having a height of 12-15 cm.

**Maintenance**
- 2-3 days before the potato springs, the final ridge of 25-30 cm is realized, and a treatment with residual herbicides based on metribuzin, prometрин, linuron, acetochlor is carried out. In the potato culture, uncontrolled weeds and the ones springing subsequently are treated post-emergently with products based on propaquizalop, haloxifop-R-methyl, fluazifop-P-butyl, quizalofop or they are eliminated by weeding or hand-weeding.

**Disease and pest control:**
- to control potato blight (Phytophthora infestans), the first treatment is applied at warning (using the AGROEXPERT SYSTEM). In the lack of this system, the first treatment is applied when the plants are 20-25 cm high, and the conditions are favourable for the attack. Approximately 5-6 treatments are applied to combat the disease. Due to the Gared variety’s relatively high resistance to the blight attack, the recommended dosage can be reduced by 20-40 %. The application of the maximum dosage is recommended when the climate conditions of temperature and humidity are very favourable and the infection pressure is very high.
- in the case of the Colorado Beetle (Leptinotarsa decemlineata) an average of 2-3 treatments are applied, depending on the attack rate. The first treatment is applied when the adults emerge from hibernation.

**Harvest**
- 15-20 days before the harvest the culture is prepared by killing the vines mechanically or chemically.

**Economical efficiency**
- 10-15 % growth of income per surface unit
- the variety’s resistance to diseases and pests, as well as the aspect of the tubers makes the variety recommended in all regions of the country.

**Application domain**
- autumn-winter consumption and industrialization

**Potential beneficiaries**
- potato cultivators in the whole country

**Conclusions**

The potato variety Nemere have a good capacity of yield, are very well adapted to soil and climate condition of Romania on the base of testing activity on the network of the National Institute for Testing and Registration of Varieties (ISTIS) before homologation.

Thanks to the high content of starch and good culinary and technological qualities.

The high resistance to viruses Y (PVY) and leaf roll (PLRV) permits the multiplication of seed potato a longer time and obtaining a more profitable yield.

The utilization of complex fertilizer (15:15:15) is efficient till N₁₅₀, P₁₅₀, K₁₅₀ level, when is possible to obtain maximum clear profit.

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**References**