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RESEARCH ARTICLE

TO TAKE NURSERY TRANSPLANT OF POTATO WITHOUT VIRUS IN THE STATE OF *IN VITRO.*

Esmagul K. E., Urinbaeva U. M. Kazyhanova A.O and Smagulova A. E.
Kazakh state women`s teacher training university almaty Kazakhstan.

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Abstract

The sown area of potatoes in Kazakhstan, according to the Ministry of Agriculture is 189 thousand hectares, the average yield of 16-17 thousand tons hectare, but in recent years due to improved production technology yields increased steadily, reaching in recent years, up to 20 thousand tons. One of the important conditions for obtaining high yields is the use of the improved disease-free planting material obtained using biotechnological methods.
The aim of our work is the standardization of the nutrient medium for the cultivation of apical meristem and obtaining virus-free test-tube plants. Test-tube plant graftage, planting on nutrient medium with phytohormones.
The effect of different phytohormone concentrations on root and tuberization.

Introduction:-

Potato is one of the most important consomed crops. It is the second most important food after the bread, because it consists of protein (2%), mineral salts(1%) which any useful for the human organism, potassium, phosphorus, iron and other different nutritious elements, vitamins as (S,B_1,B_2,B_6,D,RR,K,E), carotenoids.

One of the most difficult problem that seed agriculture of potato has is to destroy viral infections[1].The basic system of seed agriculture of potato is to renew the sort and to change the sort of the potatoes. Reconstruction of seed agriculture becomes owing to the harmful virus illnesses of the potato production. The seed agriculture without virus production materials were determined as a branch by itself in many countries. Potatoes are grown in 185 thousand hectares in Kazakhstan. According to it, the total index of output of potato consisted of 3 million tons.

The main ways of purging from mushroom illness, bacteria, potato virus are: To treat potatoes from illness by biotechnological method.

1. Thermotherapy in which the p otatoe tobers are heated at high temperature.
2. To cut out cells which are at the top meristem part of potato in orderto produce an artificial nutritious sphere by adding chemical substances which stops the growth of viruses.

On the basis of this method, if the cells which are at the top of meristem
part of dividing cells of potato tubers are grown in the sphere of artificial cells and cleaned from infection of virus exciter, the impurities (inhibition), which stop developing of infection of virus exciter in that sphere, give the

Corresponding Author:- Esmagul K. E.
Address:- Kazakh state women`s teacher training university almaty Kazakhstan

opportunity to taken sprout to dispose from virus. To join these two methods together means to grow top meristem cells after thermotherapy tubers in artificial sphere[2].

All the virus illnesses are divided into two parts which affet potato crops. They are mosaic and hepatitis. If the potato is sick of mosaic illness, yellow-green spots will appear in soils and branches of potatoes or leaves will be gathered, there will be appeared black holes consisted of dead cloth on the branches.

The viruses which spread the illness Mozaika are on the leaves and branches of the plant, but they do not appear on the head of the plant. After entering the body of the plant, the virus speed of spread will be various, it depends on their features of sort, nutritious things and growing area.
Many scientists determined that [5] when the virus enters the plant of potato by insects, it goes from leaves to potato tubers after 8-10 days. If growing time of the potatoes increases, there was defined its stamina to virus Y, so all the agricultural works directed to fast growing of the plant influences to the inhibition of the virus[6]. That is why, B.Boinyanskiy [7] informed that the quantity of 2,2 – 0,22% starch and protein of damaged plant are reduced by virus in an usual manner.
Icterus symptoms include stolbur, disease of shrinking leaves, disease like broom and so on.

The branches of potatoes which are ill with these disease become thin and yellow. The viruses of icterus disease are usually spread by insects.

Mosaic twisting of leaves disease can be shown at the top part of young leaves by a weak mosaic and from appearing of twisting (bending), curling and waving. The difference of twisting of leaves are not appeared by chlorosis and harden of leaves. M(K) goad is provided by action of damaged plant and Aphidinea (peach Aphidinea). The beginnings of pests are stored in the tubers. If the plant is damaged with viruses M, X, S, reduce of productiveness will be 15-45 %. The composition of starch will be decreased untill 2-3 %.

Virus is stored in tubers, and during the growing process it is spread by cultivate tools and insect pest.Wrinkled mosaic disease the leaves of sick potato become twisted,harder, yellow spots go on them. To grow damaged tubers are the results of non common colour of the surface of leaves from the beginning, plumping of tissue, hardening of branches, bending down of sides.

Black coloured spots appear on the leaves. Lower leaves shrivel earlier than upper leaves. The virus Y and mixed infection viruses Y, X, S, M will be reason of disease [8]. The viruses may be hidden on the plants as alfalfa, corn, cabbage and on seeds.

The virus Y is infected with the help of branches and by reaction of damaged and undamaged plants.Striped mosaic disease exciter: virus of Y (Solanum virus 2 Smith.). The storage of disease is sick tubers. External notes are: disease is noticed as mosaic on the lower part of the plant, moves to the top slowly, then stripe necrosis and spots are appeared. The leaves can be broken down sharply, become brown or they may be hanged on the main branch which are dried, thin or lifeless.

A black spots are appeared among the lines of the leaves of sick plants. Stripes mosaic is together with wicked mosaic. After the disease there are dead spots between thread on the lower surface of leaves, and dead lines appear on the thread. The branches and shoots become weak and break quickly. Sick plants become dry before the time. Damage is by tubers. Aphidineas (peach Aphidinea) are spreader in the fields.

Twisting of leaves disease uses produced bending of leaves of the middle part. The upper leaves are damaged this year, lower leaves bend on the second and third years. The lower leaves become thicker and harder. In the middle sheet the middle part of the leaves are bent, it is the reason of illness of virus L, this very virus goes mainly with the viruses X, S, M in the plant potato. The colours of leaves of sick plants are grey green and yellow. The lower leaves are stacked in layers as a boat [9]. The leaves become hard, flacky and breakable because of gathering of starch. The plant will not grow, it will not blossom and productiveness will be reduced to 70 % at once.

The exciter virus L is spread by Aphidinea which feed on potatoes. The virus is saved in the tubers [10].The technology of taking seedling materials of potato without virus begins with cultivating tubers with heat the hypothesis which was agreed by many people states that inhibition of increasing of viruses in temperature 34-40^{o}C

is related with changing of process. Due to the conditions of viruses in the tubers, they are cultivated with heat from 7 days till 7 weeks. The tubers are cultivated with things which inhibited viruses but increase growing speed of plants. In order to divide meristem upon white, 3-5 mm long seedlings will be used. Seedlings are washed up, sterilized, their apexes are divided in the boxes. It is not be possible to divide 50-100 mkm amount of meristem in the process, so first leaves are taken with them, that`s why its quantity is stretched to 500 mkm. Although, there will be viruses in the explants, otherwise growing ability of apex will increased.

The apexes are grown and developed in nutritious, agrarian sphere. After appearing of 0,3-0,5sm long shoots, they are removed to another nutritious place for better grow thand rooting very well. After growing 5-7 leaves, plants are inculcated, everyplant placed on test-tubes with the same composition. One plant is stored to test for virus. The plants without viruses are based on cured lines. They are micro inculcated systematically in order to increase speed of cured plants from virus. After inculcating plants grow quickly than meristem and their roots will be powerful and leaves will be more abindant. Due to micro inculcating in test-tubes, 2-3 thousand plants can be grown in 2-3 months.

The advantages of taking clean materials without viruses are concerned to these:

1. Possibilities of cultivating plants with heat;
2. Possibilities growing with meristem;
3. To have tests which are used well, high sensibility in finding viruses;
4. To grow and increase in the condition of cured material
5. The quantity of cured material should be enough to renew first material every year.

These agreement can not be used in various corn. At the present time all the valuable sorts of potatoes are cured by this method, but this technology is not introduced at first seed household in our country [2].

Methods and materials:-

As the object of research, there were taken sorts of the potatoes of Akkol, Aksor which were grown *in vitro* and plant was taken.

To disinfect research materials the plant was placed in a sterilized laminar box and it was regenerated.

Results and Discussion:-

The seedling was planted in MC nutritiou s field, inculcated half which grown by ethyl way of shoots. To the MC field are taken various vitamins, microelements and macroelements, carbondrates and various controllers. Macro elements N, P, K, Ca, Mg were taken in the form of salts (NH_4NO_3, KNO_3, $CaCl_2$, $MgMO_4$, KH_2PO_4). From growing control gibberilliandger was used. At the end, the growing of roots of the plants continuous and micro tubers were taken. All the plants will be grown at +25°C and 100O lk under the light. Our task is to check young shoots for virus .

Picture-1:- The potato seed planted for the second time

We don`t have test system for defining viruses M, S, Y, X, У and others and we can`t send plants to the laboratories which test for viruse.

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