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Testing for the presence of potato pathogens of viral, bacterial and viroid diseases

Dmitry Alexandrovich Kurpatov[1] and Anastasia Alexandrovna Solyanik[2]

Abstract

The article considers a complex method of selecting parental lines, which significantly reduces the time of selection of parental lines and their introduction into culture.

[1]Laboratory of immunodiagnostic of the potatoes, Research and practical center of NAS of Belarus for potato fruit and vegetable growing, Samokhvalovichi, Belarus.

[2]Laboratory of biochemistry and agrochemical research, Research and practical center of NAS of Belarus for potato fruit and vegetable growing, Samokhvalovichi, Belarus.

Corresponding author: Dmitry Alexandrovich Kurpatov
E-mail: dima9987@yandex.ru

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Introduction

The problem of reducing the quality of seed potato material, inevitably resulting from vegetative reproduction, can be solved only in case of the creation and use of healthy lines and clones of seed potatoes that match the variety and are tested for the absence of disease (1).

Material and Methods

In the world practice, the most common method of determining the virus is linked immunosorbent assay (ELISA), proposed by Clark and Adams, further enhanced by other researchers. The principle of the ELISA test is based on the determination of the complex "antigen-antibody" by introducing one of the components of the enzymatic reaction of the label with the subsequent detection using an appropriate substrate, changing their color. Today, ELISA is increasingly being used due to a number of advantages. These include high sensitivity which allows determining the concentration of 0,05 ng/ml, the minimum volume of the material, the storage stability of the ingredients, the simplicity of the reaction, the presence of both the instrumental and the visual records, the ability to automate all reaction stages, and the relatively low cost of diagnostic kits.

Recently, however, the more sensitive technique of polymerase chain reaction (PCR) is used for the determination of latent viral infection. The principle of the method is based on the detection in the material of specific DNA (RNA) fragments of different biological objects, their selective synthesis and further amplification and detection of the reaction products – amplicons (2).

Results and Discussion

Using the complex method of testing consisting of a consistent implementation of the diagnosis of potato plants by ELISA and PCR on the plants index obtained in the laboratory of the selected clones in the field, makes it possible to identify healthy ancestral lines before the introduction of tissue culture (3). Thus the entire cycle of selection of clones together with their complex diagnostics, comprising indexing ELISA and PCR prior to introducing healthy clones in vitro culture, takes nine to ten months, instead of 2 years in the previously used **Fig. 1**.

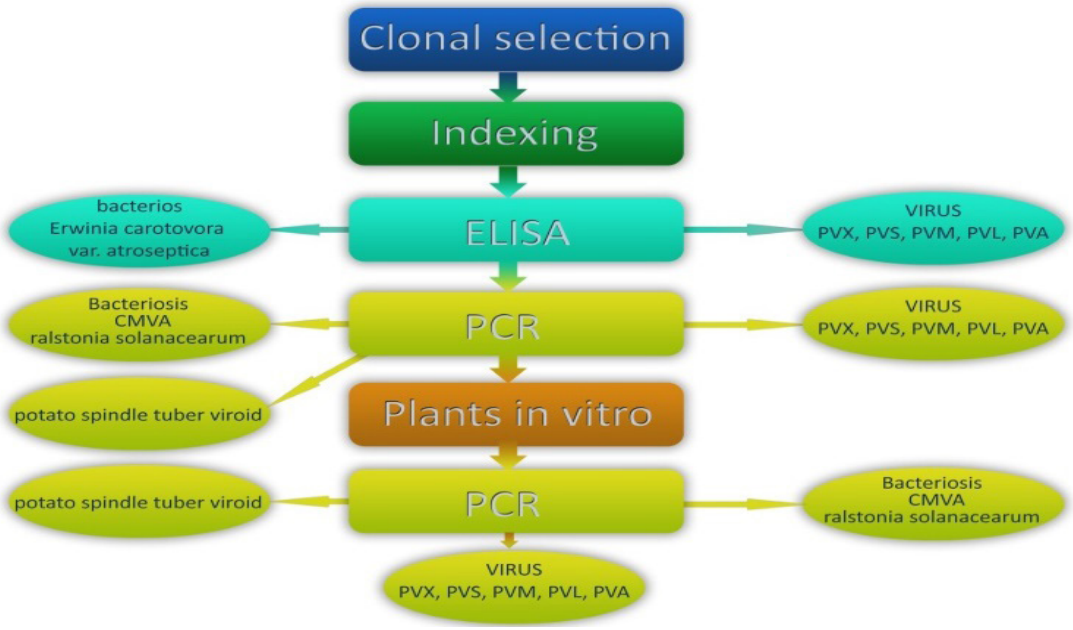

Figure 1. The selection of healthy lines potato indexing method.

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