Potato (*Solanum tuberosum*) production in Brazil is historically dependent on the import of basic seed potatoes to renew seed stocks which degenerate rapidly because of infection with aphid-transmitted viruses. Up until the mid-1990s, the major threat was from *Potato leafroll virus* (PLRV), but since then, it has been *Potato virus Y*. However, in the mid-2000s, PLRV-like symptoms were again being increasingly recorded in potato crops (cvs. Asterix, Atlantic, Agata and Cupido) at incidences of 10 to >60%, mostly in Southeast, Central and Northeast Brazil, but PLRV was not always detected. Epidemics were associated with warm seasons and very high infestations of whiteflies (>20 adults on lower leaves) but no aphids, leading to speculation of a possible transmission of a new strain of PLRV by whitefly. The whitefly-transmitted (*Bemisia tabaci, Trialeurodis vaporariorum*) crinivirus, *Tomato Chlorosis Virus* (ToCV), has now been shown to be associated with these PLRV-like symptoms in the county of Cristalina, state of Goiás (GO). PLRV-like symptoms in potato plants experimentally infected with ToCV had also been observed by others in the USA, under greenhouse conditions. However, in Spain, symptomless ToCV-infected volunteer potato plants were found. The first report of ToCV in Brazil was from field-grown tomatoes from the county of Sumaré, state of São Paulo (SP). In tomato plants, ToCV causes symptoms resembling PLRV infection. In many states, tomato crops may be grown alongside or overlapping with potato crops. Increasing spread of ToCV to potato has been recorded. In 2012, PLRV-like symptomatic potato plants from two other major potato-producing states tested positive for ToCV: (1) state of Minas Gerais, cv. Agata, 11 samples tested using ELISA (DSMZ, Germany), confirmed by real-time PCR (performed at SASA, Scotland); and (2) state of SP, county of Itapetininga, cv. Atlantic, six of eight plants, by ELISA and grafted or transmitted by whitefly to *Datura stramonium*. This year, ToCV has also been detected in GO State (Cristalina) and in SP (Paranapanema). As yet, yield losses caused by ToCV are not known. Since ToCV and its vector(s) occur in many countries and it is transmitted through the seed potato, although not all eyes may be infected, potato-producing, particularly seed potato producing, countries need to be alert to the risks and regulate it if appropriate.

Effect of Some Chemo- and Electrotherapies on Potato Virus Y and X Infected *Solanum tuberosum* L. Plantlets (cv. Roclas)

Carmen Liliana Bădărău[1], Nicoleta Chiru[1], and Ionela Cătălina Guţă[2]
[1]*National Institute of Research and Development for Potato and Sugar Beet, 2 Fundaturii, 500470 Brasov, România;* [2]*National Institute of Research and Development for Biotechnology in Horticulture, 37 Calea Bucureşti, 117715 Ştefăneşti Argeş, România*
E-mail: icpc@potato.ro

The purpose of this study is to decrease the potato virus Y (PVY) and potato virus X (PVX) infection level, using electrotherapies, antiviral compounds (ribavirin and oseltamivir) in tissue culture and several other treatments (*Satureja hortensis* essential oils, H_2O_2 1 mM pH 5.6) applied by spraying the microplants when acclimatized in a greenhouse. The biological material used in experiments was plants (variety Roclas, virus free) mechanically inoculated using PVY secondary infected plants from cv. Record (PVY^o) and PVX secondary infected plants from cv. Bintje. Electrotherapy was applied in six variants: after washing and sizing explants, potato stems infected were exposed to either 40 or 100 mA, for 5, 10 or 20 min, followed by sterilization and immediate planting the axillary bud tips in vitro. Chemotherapy was undertaken with ribavirin (RBV) and oseltamivir (OSMV) (RBV 40 mg l^{-1} + OSMV 40 mg l^{-1}; RBV 20 mg l^{-1} + OSMV 40 mg l^{-1}; RBV 20 mg l^{-1} + OSMV 80 mg l^{-1}). The first variant (RBV 40 mg l^{-1} + OSMV 40 mg l^{-1} added to the tissue culture medium + essential oils treatments of acclimatized plants) and the electrotherapy variant 10 min at 100 mA showed the highest rate of virus eradication, the maximum values of the therapy efficiency. Other researchers observed a decrease in the concentration of PVX and PVY by applying a combination of several therapies for potato, but the results obtained in our research work concerning the values of therapy efficiency were different.

Use of Thaxtomin as a Selective Agent for Screening Potato Genotypes for Resistance to Common Scab

L.H. Hiltunen[1], M. Ylikantola (Alanen)[2,3], E. Virtanen[1] and J.P.T. Valkonen[2]
[1]*MTT Agrifood Research Finland, PO Box 413, FI-90014 University of Oulu, Finland;* [2]*Department of Agricultural Sciences, PO Box 27, FI-00014 University of Helsinki, Finland;* [3]*Current address: Kalliokoskentie 343, FI-62200 Kauhava, Finland*
E-mail: lea.hiltunen@mtt.fi

Although common scab caused by *Streptomyces* spp. is an economically important disease of potato worldwide, efficient methods to control or to predict the disease are lacking. Disease-resistant plant material would be the most desirable method of controlling common scab. However, at present, there are no completely resistant cultivars available. Progress in breeding for common scab resistance is hampered by limitations in resistance screening, such as need for repeated field trials and variation in disease severity between seasons and places. The bacterial phytotoxins, thaxtomins, which are produced by the scab-causing *Streptomyces* spp. and are essential for the induction of scab symptoms, can be used to screen large numbers of potato seedlings for tolerance in vitro. In this study, thaxtomins were produced in vitro and four thaxtomin compounds isolated and characterized. The main phytotoxin, thaxtomin A, was used as a selective agent to screen 120 F1 potato progeny from a single cross. Eighteen genotypes were selected based on high sensitivity or tolerance using shoot growth as the criterion, multiplied in vitro, and tested for resistance to common scab caused by *Streptomyces turgidiscabies* and *Streptomyces scabies* in a glasshouse and in three different fields. Evaluation of ca. 6,500 tubers showed that the 18 potato genotypes differed in scab indices and disease severity. Tolerance to thaxtomin A in vitro and scab resistance in the field correlated, indicating that the in vitro bioassay could be used in the early stages of a resistance breeding program to discard scab-susceptible genotypes and elevate the overall levels of common scab resistance in the potato breeding populations.

Potato Research

Volume 57 · Number 2 · June 2014

ORIGINAL PAPERS

2014 VOLUME 57 / NUMBER 2 ISSN 0014-3065

POTATO RESEARCH

JOURNAL OF THE EUROPEAN ASSOCIATION FOR POTATO RESEARCH