

# Herbicide-Affected Plant Metabolism Reduces Virus Propagation

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*Dedicated to the memory of Klaus Schmelzer PhD (1928–1976), a friend and fellow scientist of József Horváth*

It has been previously shown that certain herbicides or plant extracts inhibited the viral infection. The goal of this study was to investigate the effect of *Obuda pepper virus* (ObPV) infection and herbicide or plant extract treatments on the photosynthetic processes of the host plants to get informations about the interactions of these factors. In *Capsicum annuum*-ObPV host-virus relations the virus infection slightly increased the activity of photosystem II (PSII), as it was supposed from fluorescence induction parameters. Chlorophyll content of leaves was also elevated probably due to virus-induced growth inhibition. The herbicide Stomp (active ingredient: pendimethalin) incorporated into the soil one week before planting (preplant treatment) together with virus infection even strengthened these effects in agreement with previous observations that this herbicide always did not prevent virus infection or reduce virus concentration in hosts. In ObPV-infected *Nicotiana tabacum* the structural changes showed similar tendency like in ObPV-infected *C. annuum*, but PSII efficiency did not significantly differ from that of the control. However, non-photochemical quenching (NPQ) increased because of the strongly decreasing CO<sub>2</sub> fixation activity. Though simultaneous application of a water extract of *Cirsium arvense* shoot caused a little stronger inhibition of CO<sub>2</sub> fixation, little loss in production was obtained due to significant reduction in virus concentration. In *Solanum nigrum*-ObPV relation the slightly increasing tendency of the values of actual PSII quantum efficiency could be related to the probably elevated ratio of reaction centre components (increased chlorophyll *a/b* ratio) in the thylakoids. Application of the herbicide Fusilade S (active ingredient: fluazifop-P-butyl) at 4–6 leaf stage as a post-emergence treatment practically prevented systemic virus infection and the virus-induced changes of photosynthesis are probably due to inhibiting the virus infection/replication process.

**Key words:** Plant Viruses, Herbicides, Photosynthesis