

## EXOGENOUS DSRNA APPLICATION IN TOMATO PLANTS TARGETING ESSENTIAL GENES IN HALYMORPHA HALYS

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The brown marmorated stink bug, *Halymorpha halys* (Stål) (Hemiptera: Pentatomidae) is a highly polyphagous insect native to Asia that currently causes severe crop loss worldwide. In Italy, *H. halys* has damaged fruit orchards, row crops, vegetables, and ornamentals for almost 10 years. One of the recent pest management practices involves the use of RNA-interference (RNAi), a highly specific gene silencing mechanism in which the introduction of double-stranded RNA (dsRNA) and the production of small interfering RNAs (siRNAs) post-transcriptionally targets complementary mRNAs inhibiting their translation. Spray-induced gene silencing (SIGS) is a potential agricultural pest management strategy where the dsRNA-sprayed plant is consumed by the pest resulting in gene silencing-induced insect mortality. Previous studies have shown an increase in mortality in *H. halys* using dsRNAs targeting IAP and PP1 genes, which are involved in apoptosis and other cellular processes. Tomato plants were treated with sequence-specific dsRNA targeting the IAP and PP1 genes through SIGS and feeding assays in the greenhouse. Insect mortality was monitored for two weeks and plant gene expression changes were assessed through qRT-PCR. *Halymorpha halys* mortality differed between treatments, and expression changes of some genes involved in plant RNAi were detected. Our results suggest the use of SIGS for *H. halys* pest control as well as an initial understanding of the effect of foreign dsRNAs in the plant at the molecular level. The use of dsRNA in plants targeting essential pest genes might represent a new generation of environmentally friendly biopesticides.