

Nonchemical-based Sprays for Triggering Host Resistance: A New Strategy to Manage Spotted Wilt Virus

Summary

“RNAi-based resistance” a technology that exploits the RNAi machinery of the plants to protect them from viral infection. We intend to devise a strategy to reduce crop loss by inducing plant defense against the virus. A recent study from our group and other groups has explicitly demonstrated that the application of exogenous dsRNA targeting the TSWV genome has provided promising results in controlling TSWV infection in model plants and commercial crops. We use this rationale to exploit the dsRNA-mediated “RNAi-based virus resistance” to induce resistance against TSWV infection in peanut and tobacco.

Our published study found that dsRNA treatments had a positive influence on controlling TSWV infection. In this study, we have further extended and used two different approaches (Preventive and Curative) to make a step to understand the most feasible way of controlling TSWV using this approach. Both approaches positively controlled the viral infection but the preventive approach gave better results than the curative approach. Regarding the percentage of disease incidence the viral titre preventive approach seems to be better at the 9-dpi. In the preventive approach, the application of dsRNA activated the RNAi mechanism that restricted the movement of the virus in the inoculated leaves. The mechanism needs to be worked out for the curative approach since it also aids the plant in controlling the viral infection. Focus is required in understanding how the dsRNA-mediated resistance could be helpful after the onset of infection in the fields. Our preliminary study hints that irrespective of the approach, treating the crops with dsRNA helps the plant fight against the virus.