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**Regione  
Lombardia**

**I.N.P.A.C.T.** (acronym for "Introduction of New Products and Agronomic Practices with low environmental impact for the Containment of Tomato Spotted Wilt Virus") promotes good practices in horticultural production, in particular salads, endives and chicory for fourth range able to counteract the onset of Tospovirus pathogens and encourage the adoption of sustainable solutions for the conservation of soil fertility.

INPACT's experimental activities focused on:

- TSWV detection protocols and monitoring of the presence of vector insects.

The experimentation, applied to the cultivation of sugar loaf chicory, had as its objective the identification of symptoms of TSWV and the presence of vector insects, in particular *Frankliniella occidentalis*, one of the major factors responsible for the transmission of the pathogen. The installation of chromotropic traps made it possible to monitor the presence of harmful insects and favor their massive capture. In addition, the use of easy-to-use lateral flow assays allows operators to monitor TSWV in the field without requiring the intervention of highly specialized personnel to carry out a diagnosis in the laboratory.

- Biochar and Trichoderma to contain the damage caused by TSWV

The experimentation involved the combined use of biochar and Trichoderma, in integrated management farms, and Trichoderma alone, in organic farms, and aims to decrease the incidence of the disease. At the same time, the presence of thrips within the plots where the different treatments were applied was also assessed. Biochar, consisting of 90% carbon content, is a powerful soil conditioner and promotes the prolonged availability of nutrients to the plant, improves the structure of the soil and decreases the need for water and fertilizers. Furthermore, soil microbial communities can be influenced by the use of biochar as: (1) it provides them with a habitat, also favoring the development of Trichoderma (Quilliam et al. 2013; Jiang et al. 2016); (2) it can absorb substances that inhibit their growth (Kasozi et al. 2010); (3) it can alter the composition of the community through changes in humidity, pH or concentration of micro and macro elements (DeLuca et al. 2015b; Pingree and DeLuca 2017; Yu et al. 2018).

- TSWV resistance test and Life Cycle Assessment

The experimentation involved the selection of TSWV-resistant lettuce and sugar loaf chicory. Real time PCR and enzyme immunoassays help to quantify the virus in the tested lines / varieties to highlight any differences. The data deriving from soil analysis and Life Cycle Assessment analyzes were used to determine the influence of the various agronomic practices and suggest any corrections regarding fertilization or the administration of useful organisms.

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