

at a rate of 3.0 L/ha and 3.3 L/ha using a knapsack sprayer with a spray volume of 450 L/ha. Soil samples were obtained at three sites within each plot at day 0 (before) and 1, 7, 28, 56, and 84 days after application (daa). The soil fungal population and diversity were assessed using amplicon sequencing data of the rDNA internal transcribed spacer (ITS). Analyses of OTUs revealed a variation in the richness (number of species) and diversity of fungal species within the treated plots before and after spraying. Nevertheless, the changes are not statistically significant, except at 84 daa. The trends were similar for the control plot; hence, it is improbable to attribute the changes to the use of both herbicides. The abundance of some species was shown to have significant changes (decrease or increase). However, additional research is required to determine whether these changes are a result of herbicide usage or other factors such as climate conditions (such as rainfall and temperature). The findings in this study show that there is no strong evidence that the application of both glyphosate and glufosinate ammonium at the recommended rate has a significant impact on overall soil fungal diversity and population.

different isolates has been verified through Koch's postulates fulfilment, further work is needed to conclusively elucidate the role of *P. vexans* and other oomycetes (mainly *Phytophthora spp.*) in the wider context of plant-microbiome-environment interactions.



Figure 1.

**SE30 006**

**STATE OF THE ART ON THE KIWIFRUIT VINE DECLINE SYNDROME IN ITALY**

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Kiwifruit Vine Decline Syndrome (KVDS) is dramatically impacting kiwifruit industry in Italy. KVDS causes kiwi vine root rots with the consequent collapse of plants within a few months after the appearance of the first symptoms (Figure 1). Once symptoms appear on the canopy, the root system is already compromised (Figure 2). After over 10 years from the first reports, the mechanisms behind KVDS are not yet fully understood, although its biotic origin has been demonstrated and the climate change is likely to play an important role in promoting the syndrome. Several putative pathogens including Fungi and Bacteria have been associated to KVDS, but only Oomycete species have been constantly detected on symptomatic plants in different geographic areas. Here we summarize results of investigations conducted in northwest, northeast and southern Italy to characterize the microorganisms associated to KVDS by analysing roots, rhizosphere and soils using conventional isolations, baiting and metagenomic analyses. Taken together, our results support the role of oomycetes, belonging to different genera, as causal agents of KVDS. In northwest and southern Italy *Phytophthora vexans* is the most frequently detected species and it is significantly more abundant in both soil, rhizosphere, and root samples collected from symptomatic plants, although, genetically different populations seem to be associated to different geographic areas. Several other oomycete species have also been detected including *Phytophthora litorale*, *P. chamaeophyon*, *Phytophthora spp.*, *Globisporangium spp.*, and *Pythium spp.*. In particular, a *Phytophthora* taxon closely related to *P. sojae/asiatica* (clade 7) seems to play a relevant role in northeast Italy. Even if pathogenicity of



Figure 2.