THE ORGANIZATION OF NEMATOLOGISTS OF TROPICAL AMERICA

CAIRO, EGYPT

53rd ONTA ANNUAL MEETING

September 24-29, 2023

"Nematodes and Food Security: Urgency, Discovery and Global Exchange"

https://ontaweb.org/meeting2023/

50 RESPONSE OF TOMATO CULTIVARS TO THE RICE ROOT-KNOT NEMATODE *Meloidogyne graminicola* [RESPUESTA DE CULTIVARES DE TOMATE AL ATAQUE DEL NEMATODO AGALLADOR DEL ARROZ *Meloidogyne graminicola*]. **L. Rusinque**(1,2,3), R. Neves(4), C. Maleita(2,3), M. L. Inácio(1,5). (1)National Institute for Agrarian and Veterinarian Research (INIAV, I.P.), Oeiras, Portugal, (2)University of Coimbra, Chemical Process Engineering and Forest Products Research Centre, Department of Chemical Engineering, Coimbra, Portugal, (3)University of Coimbra, Centre for Functional Ecology - Science for People and the Planet, Department of Life Sciences, Coimbra, Portugal, (4)Polytechnic Institute of Coimbra, Coimbra Agriculture School, Coimbra, Portugal, (5)GREEN-IT Bioresources for Sustainability, Institute of Chemical and Biological Technology, Nova University of Lisbon, Oeiras, Portugal. leidy.rusinque@iniav.pt

Tomato (*Solanum lycopersicum* L.) is an important and versatile vegetable crop of great nutritional relevance. Worldwide production, in 2021, was about 189 million tons, more than half coming from Asia (approx. 63%), followed by the Americas and Europe. The European Union holds 9.5% of the world production with Italy reporting the highest production (approx. 37.1%). Portugal is the 3rd largest European producer with approximately 1.7 million tons, corresponding to 9.7% of the EU total. Plant parasitic nematodes (PPN) are highly damaging pests as they cause serious losses worldwide. A considerable part of this damage is caused by root-knot nematodes (RKN), *Meloidogyne* spp., one of the most devastating pests of economically important crops. *Meloidogyne graminicola* (*Mg*) is the most serious PPN of tropical rice production. It was reported for the 1st time in Europe in 2016 in Italy. In addition to rice, *Mg* has a wide range of hosts, including cereals, grasses, and some horticultural crops among which is tomato. However, contradiction among authors regarding wheat and tomato as important hosts has been found, so, the response of four commercial cultivars (Ox-Heart, Rio-Grande, Marmande, Tiny-Tim) traditionally used in Portugal was evaluated. The experiment was carried out in a quarantine greenhouse. Tomato seeds were germinated at 27°C and sown in individual pots (500 cm^3) with substrate and sand (1:2), daily watered and fertilized once a week. Plants of *Echinochloa crus-galli* were included as positive control. Each plant was inoculated with 200 second stage juveniles (J2) (initial population density, Pi) three weeks after planting. After 30 days, plants were harvested, root systems washed, the number of galls quantified, and Mg gall index (GI) determined. Eggs and juveniles were extracted from roots and soil to find out the final population density (Pf) and the reproduction factor (Rf=Pf/Pi) calculated. *Mg* host suitability was assessed based on GI and Rf. Results show that all the tomato cultivars were susceptible to *Mg* ($4.8 \leq IG \leq 5$ e $39,8 \leq Rf \leq 53,3$). To confirm the infection was caused by *Mg*, biochemical and molecular identification was performed. The *Mg* isolate displayed an esterase phenotype corresponding to VS1-*Mg*. The molecular analysis using *Mg* specific primers presented a band of the expectable size. It can be concluded that the infection was caused by *Mg* and that this species may also constitute a potential threat to tomato production.

51 INTERACTION BETWEEN *Mesocriconema xenoplax* AND *Ilyonectria macrodidyma* ON *Vitis* spp. GENOTYPES [INTERACCIÓN ENTRE *Mesocriconema xenoplax* E *Ilyonectria macrodidyma* EN GENOTIPOS DE Vitis spp.]. **W. R. Silva**(1), S. G. Correia(1), C. B. Gomes(2), J. V. Araújo Filho(1) and M. A. K. Almança(3). (1)Federal University of Pelotas, Pelotas, Brazil, (2)Embrapa Temperate Climate, Pelotas, Brazil, (3)Federal Institute of Rio Grande do Sul Bento Gonçalves, Brazil. wellmsr@outlook.com

Plant-parasitic nematodes and fungi that cause trunk diseases have been found associated with grapevine decline disease (GDD) in southern Brazil on other important world wine regions around the world. However, the interaction between these agents in the development of GDD is still unclear. Considering the importance of these pathogens to the vine crop, the present study aimed to study the interaction between the ring nematode (*Mesocriconema xenoplax*) and the causal agent of the black foot (*Ilyonectria macrodidyma*) on the predisposition of *Vitis* spp. genotypes to GDD. The study was carried out at greenhouse conditions (completely randomized design with six replications of a pot containing sterilized soil and one plant) using four genotypes (Paulsen 1103, R99, VR043-43 and Bordô). The soil of each pot was infested with 1.000 specimens of *M. xenoplax* and, after 30 days, the plants were inoculated with 10 mL of a spore suspension (2,5x106 spores/mL) of *I. macrodidyma* through small holes at the base of each plant. The plants were submitted to different combinations with *M. xenoplax* (+Mx and -Mx) and *I. macrodidyma* (+Im and -Im). After 184 days, nematode reproduction, plant growth parameters and vascular symptoms were assessed. Paulsen 1103 and R99 genotypes showed reductions in root (RFW) and shoot (SFW) fresh weight in the interaction (+Mx+Im). Analyzing the isolated effect of each pathogen (+Mx-Im and -Mx+Im), the greatest negative effects were observed in the interaction between the pathogens. Bordô genotype showed reductions in SFW in both interaction and isolated effect, on the other hand, reductions in RFW were observed only in the interaction and in the isolated effect of the nematode. VR043-43 genotype was resistant to *I. macrodidyma* and immune to *M. xenoplax*. The other genotypes showed different levels of susceptibility to *M. xenoplax* ($82.9 > FR > 2.5$), highlighting the high susceptibility of Bordô. Vascular symptoms were higher in +Mx+Im than in the isolated effect of *I. macrodidyma* for Paulsen 1103, R99 and Bordô, suggesting synergism between the pathogens. In addition, the population of *M. xenoplax* was significantly higher in the presence of *I.macrodidyma*. The interaction between *M. xenoplax* and *I. macrodidyma* potentiates damage and is an important factor in the development of GDD.