inoculated with 5,000 eggs and second stage juveniles of *M. javanica* using six replicates. Fifty-five days after inoculation, each plant was evaluated for number of galls/root, galls number/1.76 cm^2/tuber, nematode reproduction factor (RF). Subsequently, the sensorial quality and the respective total phenolic compound levels in the tubers were also determined. P2 and P4 were the most aggressive *M. javanica* populations exhibiting the higher values of all studied nematode variables interfering in the expression of symptoms on both potatoes cultivars. Additionally, all the populations affected the flavour of cooked potatoes in both of the tested cultivars and higher levels of phenolic compounds were observed in potatoes infected with *M. javanica* P2 population.

REACTION OF POTATO CULTIVARS TO *MELOIDOGYNE HAPLA* AND *M. MOROCCIENSIS*. **Lima-Medina[1], I., J.T. Schafer[2] and C.B. Gomes[1].** [1]Embrapa Clima Temperado, Cx Postal 403, Pelotas/RS, Brazil; [2]PPGFS/Universidade Federal de Pelotas, Campus Universitário s/n C. P. 354, Pelotas/RS, Brazil.

In Brazil, different species of root-knot nematodes, affect potatoes. However, there are few studies of genetic resistance to *Meloidogyn*e species. The objective of this study was to evaluate the reaction of nine commercial potato cultivars to *Meloidogyne hapla* and *Meloidogyne morocciensis* in greenhouse conditions. Potato plants kept in pots with sterilized soil were inoculated with 5,000 eggs and second stage juveniles of *M. hapla* or *M. morocciensis*/plant using six replicates/genotype. 'Santa Cruz' tomato plants received the same inoculum level and were used as control. Fifty-five days after inoculation, each plant was evaluated for the number of galls, eggs and juveniles./root system. Subsequently, the reproduction factors (RF) of the two *Meloidogyne* species were determined in the different genotypes. Among the tested cultivars, BRS Ana, Asterix, BRSIPR Bel, Cota, Cristina, BRS Clara, Catucha, and Eliza were susceptible to both *Meloidogyne* species. Besides being susceptible to *M. morocciensis*, 'Agata' was also moderately susceptible to *M. hapla*.

FREE LIVING NEMATODES AS INDICATORS OF THE BIOLOGICAL STATUS OF AUSTRALIAN CEREAL SOILS. **Linsell[1], K., A. Stirling[2], D. Hartley[3], Herdina[1], A Cheshire[4], J. Nobbs[1], A. McKay[1], G. Stirling[2] and K. Ophel Keller[1].** [1]South Australian Research & Development Institute (SARDI), GPO Box 397, Adelaide, 5001, South Australia, Australia; [2]Biological Crop Protection Pty. Ltd., 3601 Moggill Road, Moggill, 4070, Queensland, Australia; [3]CSIRO Ecosystems Science, GPO Box 1700, Canberra, 2601, ACT, Australia; [4]Science to Manage Uncertainty, 24 Winding Way, Belair, South Australia, 5052, Australia.

The impact of management practices on the biological status of cereal-growing soils was investigated across a range of Australian soil types and climates through nematode community analysis, across multiple years. A multivariate statistical analysis approach identified the two key drivers influencing changes within free-living nematode communities to be soil type which is linked to regional rainfalls, particularly 1-3 months prior to crop sowing and the application of certain nutrients, particularly N, P, S and Cu. Significant shifts in nematode population structures were also characterised by tillage regimes when analysed by soil type. Stubble management and prior plantings did not influence community changes except where canola and legumes were included in the cereal rotations. A Bray–Curtis measure of similarity characterised the contribution of each species/genera driving the changes between each management/environmental treatment and seventeen free-living species were identified as good indicators. Since manual nematode community analysis is laborious and requires specialised taxonomic skills, molecular technologies were developed to allow routine indicator identification and quantification in soil, which can be delivered as part of diagnostic service for soil-borne pathogens. Nine DNA tests were developed incorporating eleven of the free-living nematode indicators and are predicted to detect more than 80% of the species present in Australian cereal cropped soils. There was a very strong correlation between free-living nematode community structures obtained from the manual count and DNA tests. Therefore, we concluded that DNA tests are a sensitive, quick and robust tool for assessing free-living nematode communities, and provide a useful indication of a soil's biological status.

DAMAGE FUNCTIONS OF *MELOIDOGYNE JAVANICA* ON ZUCCHINI SQUASH AND RELATIVE LEAF CHLOROPHYLL CONTENT. **López-Gómez[1], M., F.J. Sorribas[2], M. Talavera[3] and S. Verdejo-Lucas[1,4].** [1]IRTA. Crta de Cabirls Km 2. 08348 Cabrils, Barcelona, Spain; [2]Universitat Politècnica de Catalunya. 08860 Castelldefels, Barcelona, Spain; [3]IFAPA. Camino de Purchil s/n. Granada. Spain; [4]IFAPA. Camino de San Nicolás, 1. 04745 La Mojonera, Almería. Spain.

Yield losses in cucurbits have been reported in many horticultural regions. Zucchini-squash is an important crop in southern Spain accounting for one third of the production in the country. For sustainable management of root-knot nematodes in susceptible crops, it is essential to develop accurate information on population densities that cause yield losses and quantify them into plant damage functions. This study was conducted to determine maximum multiplication rate and equilibrium density of *Meloidogyne javanica* on zucchini squash cv Amalthee in response to increasing initial population densities and to develop damage function models. Seedlings were inoculated with 0, 0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, and 1024 eggs of *Meloidogyne* per cm^3 of soil in repeated experiments in a greenhouse. The maximum multiplication rate was 511, and the equilibrium density 8135 eggs + J2 cm^{-3} soil. The relationship between Pi and relative plant top dry weight fitted the Seinhorst damage function model (R^2=0.53; P=0.0002). Values for minimum relative yield, tolerance limit, and constant z