



Follow on surveys

PW17001 Final report Appendix 6 Integrated pest management of nematodes in sweetpotato

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**Hort
Innovation** SWEETPOTATO
FUND

This project has been funded by Hort Innovation using the sweetpotato research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au



This publication has been compiled by Jennifer Cobon of Agri-science Queensland, DAF.

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Summary

Monitoring of fields was carried out during the length of the project at blocks where growers were concerned crops were being affected by persistent nematode infections. Blocks were resampled and soil samples were processed to determine the number of plant-parasitic nematodes present and whether these nematode species could be impacting yield and marketable product.

Outcomes

Analysis of these samples has led to increased knowledge on nematode distribution for growers and researchers. Growers have a greater understanding of the plant-parasitic nematodes in their fields and of those species impacting crop yields and damage. Individual growers have been informed of all nematode species in their blocks and population changes over time

Follow on surveys.

Introduction

Monitoring of fields was carried out during the length of the project at blocks where growers were concerned crops were being affected by persistent nematode infections. Blocks were resampled and soil samples were processed to determine the number of plant-parasitic nematodes present and whether these nematode species could be impacting yield and marketable product.

Materials and Methods

General methods are described in detail in appendix 2.

Results and discussion

Four blocks in northern NSW and seven blocks in Central Qld were monitored. The major nematode species in northern NSW were root-knot nematode (RKN) and lesion nematode. In Central Qld the blocks were infested with very high numbers of root-knot nematode (D50, 10,599/200 g dry weight soil) or high numbers of reniform nematode (D36 and D37) (Table 1). In Central Qld, where root-knot and reniform nematodes are plentiful, it appeared that the two species were not in high numbers in the same block. Where there were high numbers of reniform nematodes in a block, there were low numbers of root-knot nematode and vice versa.

Table 1 Plant-parasitic nematodes extracted from 'follow up' soil samples received during the course of the project.

			Plant-parasitic nematodes/200 g DW soil										
Sample ID	Sample ID	Region	Root-knot <i>Meloidogyne</i> sp.	Reniform <i>Rotylenchulus</i> <i>reniformis</i>	Lesion <i>Pratylenchus</i> sp.	Reniform <i>Rotylenchulus</i> <i>parvus</i>	Spiral <i>Helicotylenchus</i> <i>dihystera</i>	Spiral <i>Rotylenchus</i> <i>brevicaudatus</i>	Stubby <i>Paratrichodorus</i> sp.	Dagger <i>Xiphinema</i> sp.	Stunt <i>Tylenchorhynchus</i> sp.	Ring <i>Criconemella</i> sp.	Total Free-living Nematodes
EC05	2018	northern NSW	46	0	0	0	8	0	0	0	0	0	2282
EC05	2020	northern NSW	0	0	0	0	9	0	0	0	0	1	1232
EC05	2021	northern NSW	217	0	0	0	123	8	6	0	0	0	979
EC05	2022	northern NSW	37	0	12	0	128	0	92	0	0	44	917
EC05	2022	northern NSW	6	0	0	0	85	0	21	0	0	1	913
RL24 A	2020	northern NSW	1	0	9	2	8	0	0	0	0	0	889
RL24 B	2020	northern NSW	30	0	10	24	35	0	0	0	0	0	819
RL24 C	2020	northern NSW	140	0	0	0	39	0	0	0	0	0	1662
RL20	2018	northern NSW	34	0	4	0	120	0	1	0	0	0	1119
RL20	2022	northern NSW	2	0	0	0	54	7	3	0	0	0	310
RL25	2018	northern NSW	4	0	0	0	25	0	1	0	0	1	1084
RL25	2022	northern NSW	92	0	0	0	17	0	2	0	0	0	260
RL65A	2020	Central Qld	2	176	6	0	0	0	0	0	0	0	3777
RL65B	2020	Central Qld	1	37	22	0	0	0	0	0	0	0	2217
RL65B	2022	Central Qld	0	122	5	0	0	0	0	0	0	0	1260

D36	2020	Central Qld	1	0	0	0	0	42	0	0	0	0	624
D36	2021	Central Qld	39	4213	0	0	0	39	0	0	0	0	1482
D36	2022	Central Qld	0	0	0	0	0	1	0	0	0	0	267
D36	2022	Central Qld	0	180	0	0	0	0	0	0	0	0	343
D36	2023	Central Qld	0	742	0	0	0	0	0	0	0	0	1819
D37	2020	Central Qld	0	57	0	0	0	1	0	0	0	0	541
D37	2021	Central Qld	0	804	0	0	0	0	0	0	0	10	3916
D37	2022	Central Qld	0	0	0	0	0	18	0	0	0	0	742
D37	2022	Central Qld	0	91	0	0	0	0	0	0	0	0	181
D37	2023	Central Qld	0	3371	0	0	0	0	0	0	0	0	3339
D38	2020	Central Qld	0	42	0	0	0	0	1	0	8	5	612
D38	2021	Central Qld	0	0	0	2	0	0	0	0	1	2	509
D38	2022	Central Qld	0	0	3	0	0	0	12	0	0	0	992
D38	2022	Central Qld	103	3	0	0	0	0	4	0	5	0	1715
D38	2023	Central Qld	550	0	0	0	0	0	0	0	0	5	243
D50	2021	Central Qld	10599	0	0	0	0	0	0	0	0	89	1191
D50	2022	Central Qld	797	0	0	0	0	0	0	0	0	0	564
D50	2022	Central Qld	23	0	0	0	0	0	0	0	0	15	1721
D50	2023	Central Qld	2974	0	0	0	0	0	0	0	0	28	333
RL12	2018	Central Qld	1	0	44	0	2	0	1	0	0	0	895
RL12	2021	Central Qld	0	0	0	0	0	0	0	0	0	1	387
RL12 C	2022	Central Qld	0	0	2	0	0	0	0	0	0	3	622
RL12 T	2022	Central Qld	326	0	0	0	0	0	16	0	0	32	538
RL12 V	2022	Central Qld	9	0	0	0	0	0	0	0	1	3	368

RL12	2022	Central Qld	47	0	16	0	0	0	1	0	10	1	1304
RL12	2023	Central Qld	0	2	2	0	0	0	0	0	0	2	259
RL64	2020	Central Qld	0	0	25	0	28	0	0	1	0	0	1173
RL64	2021	Central Qld	0	1	0	0	2	19	0	0	0	0	991
RL64	2022	Central Qld	0	20	0	0	0	2	0	0	0	0	1525
RL64	2022	Central Qld	0	0	0	0	0	210	0	35	0	17	2639
RL64	2023	Central Qld	0	2	0	0	0	3	0	0	0	0	1096

Selected case studies

EC05 northern NSW

Root-knot nematode numbers relatively low, highest in 2021 (217/200 g dry weight soil) when sampled post-harvest. This had been a “wonderful crop” of Orleans. Used rotations of Jumbo sorghum. Numbers of RKN low post-harvest 2022 (6/200 g dry weight soil).

RL24 northern NSW

A rows 1-10, treated with Nimitz and Vydate after planting, 1 RKN, 9 lesion nematode.

B rows 11-15, Nimitz 30 RKN, 10 lesion nematodes.

C rows 35-45, Metham, 140 RKN, zero lesion nematode.

D50 hot spot area Central QLD

First sampled in 2021 just after harvest of Golds with visible pimples on spuds (RKN 10,599/200 g dry weight soil). Sprayed to kill the nightshade and Mexican poppy, both very good hosts of RKN. Bare fallow in 2022 and resampled, RKN 797/200g dry weight soil. Fumigated with methane and numbers reduced RKN to 23/200 g dry weight soil. Planted Orleans, Vydate applied to label, soil sampled at harvest, 2,974/200 g dry weight soil. Still RKN pressure (black eyes and pimpling), but not as severe as at 2021.

D36 hot spot area A Central Qld

Sampled after Nimitz 2020, 1 RKN and zero reniform nematode/200 g dry weight soil. Pigs to remove volunteers in Sept 2021 when sampled. Thirty-nine RKN and reniform nematode 4213/200 g dry weight soil. Used heavy black clay and bare fallowed, zero RKN and zero reniform nematode. Bare fallow, roundup, Nimitz, zero RKN and 180 reniform nematode/200g dry weight soil in Oct 2022. Applied Vydate and planted 4 varieties, no signs of nematode damage. Sampled after short fallow, zero RKN and 742 reniform nematode/200g dry weight soil. Reniform nematode hard to control once the field is infested.

D37 hot spot area A Central Qld

Sampled after previous crop of Lush sorghum. Zero RKN and 57 reniform nematode/200 g dry weight soil. Pigs to remove volunteers in Sept 2021 when sampled – zero RKN and 804 reniform nematode/200 g dry weight soil. Used heavy black clay and bare fallowed and Jumbo, zero RKN and zero reniform nematode. October 2022, zero RKN and 91 reniform nematode/200 g dry weight soil. Four sweetpotato varieties, no signs of nematode damage, fallow, pigs in block, June 2023 – zero RKN and 3,371 reniform nematode. Reniform nematode hard to control once the field is infested.



Image 1 A block sampled post-harvest in response to high crop damage levels.