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Impact of *Pratylenchus thornei* on Main Season Wheats

Trial ID: NGA1505 - Main Season Wheat NVT **Location:** Macalister **Trial Year:** 2015
Investigator: Linda Bailey

Planting Date:	28/05/2015	Total Soil N:	150kg N/ha (18/02/2015)
Harvest Date:	2/11/2015	Colwell P:	21mg/kg (0-10cm) 8mg/kg (10-30cm)
Low <i>P thornei</i> (ex-Caparoï 2013):	2.7 Pt/g Soil (18/02/2015)	BSES P:	24mg/kg (0-10cm) 10mg/kg (10-30cm)
High <i>P thornei</i> (ex-Strzelecki 2013):	29 Pt/g Soil (18/02/2015)	Target Plant Stand:	90/m ²
PAW Wheat:	130mm (18/02/2015)	Plot Size (Planted):	9 x 2 m (5 rows x 36cm)
Granulock Z Extra (at Planting):	40kg/ha	Plot Size (Harvested):	6 x 2m
Objective:	To evaluate the impact of <i>Pratylenchus thornei</i> on yield of commercial main season wheat varieties together with the impact of variety choice on nematode populations		
Keywords:	Wheat, <i>Pratylenchus thornei</i> , root-lesion nematode, RLN		

Crop Scientific Name:		<i>Triticum aestivum</i>					
Crop Name:		Wheat					
Rating Date:		7/09/2015	2/11/2015	2/02/2016	2/02/2016	2/02/2016	2/02/2016
Rating Type:		NDVI	YIELD	PROTEIN	MOISTURE	TEST WEIGHT	SCREENINGS
Rating Unit:		Ratio	t/ha	%	%	kg/hL	%
ARM Action Codes:		AS					
Trt No.	Treatment						
TABLE OF A MEANS (Nematode Population)							
1	Low <i>Pt</i>	0.787ta	4.57-	13.8-	13.7-	77.2b	3.6-
2	High <i>Pt</i>	0.769tb	4.51-	13.7-	13.7-	77.6a	3.4-
TABLE OF B MEANS (Variety)							
1	B53	0.812tabc	4.83b-e	13.9ijk	14.1ab	77.9e-j	2.9ijk
2	Baxter	0.807ta-e	4.66e-k	14.4def	13.4l-p	79.1ab	1.7m
3	Buchanan	0.777th	4.67e-j	13.1pqr	14.1abc	77.2klm	2.9ijk
4	Condo	0.752tij	4.23qr	14.0hij	13.7e-k	77.3klm	4.9bcd
5	Crusader	0.737tkl	4.26pqr	14.2efg	13.8b-j	78.4cde	2.6jk
6	Dart	0.728tlm	3.94st	13.8jkl	13.8b-i	76.4n	5.3ab
7	Experimental 1	0.732tklm	4.29opq	13.5mn	13.4l-p	74.3o	5.2abc
8	Tungsten	0.730tklm	4.50j-n	14.0hij	13.5k-o	77.8f-k	2.3klm
9	Experimental 2	0.810ta-d	4.75c-h	13.7klm	13.5i-o	76.9lmn	2.7ijk
10	Experimental 3	0.776th	4.63f-l	13.5mno	13.1p	73.4p	5.2abc
11	EGA Wylie	0.819ta	4.96ab	14.5bcd	13.3nop	79.4a	2.6jkl
12	Elmore CL Plus	0.797tdef	4.52j-n	13.6klm	13.6g-m	79.6a	4.1ef
13	Hartog	0.760ti	4.30opq	13.7klm	13.8c-j	77.5ijk	3.7fgh
14	Impala	0.753tij	4.42nop	13.7klm	14.1a-e	76.8lmn	2.5jkl
15	Jade	0.799tc-f	4.10rs	14.4def	13.3nop	74.8o	5.4ab
16	Kennedy	0.728tlm	4.16qr	14.8a	13.5j-o	76.6n	3.0hij
17	Kidman	0.813tab	4.50j-n	14.0ghi	13.9b-g	78.3c-h	2.9ijk
18	Lang	0.815tab	4.27pqr	14.8ab	14.1a-d	78.7bc	2.9ijk
19	Livingston	0.776th	4.57h-n	14.2fgh	13.9b-g	77.3jkl	3.4ghi
20	Experimental 4	0.729tlm	4.82b-e	13.1pqr	13.8c-j	76.7mn	3.6fgh
21	Longreach Reliant	0.781tgh	4.88a-d	12.9st	13.8d-k	78.4c-f	3.8fg
22	Experimental 5	0.801tb-f	4.56i-n	14.7abc	13.7f-l	78.5bcd	1.9lm
23	QALBis	0.723tm	3.83t	12.6t	13.3nop	72.4q	5.6a
24	Experimental 6	0.809ta-e	4.75c-g	13.1pq	14.0a-f	77.7h-k	3.3ghi
25	Experimental 7	0.792tfg	4.55i-n	14.4def	13.3m-p	77.6ijk	1.8m
26	Spitfire	0.780tgh	4.43m-p	14.5cde	13.6h-n	79.6a	3.6fgh
27	Steel	0.777th	5.04a	12.9rs	13.8b-j	78.1d-i	3.9efg
28	Sunguard	0.811ta-d	4.71d-i	13.6klm	13.8b-i	78.3c-g	3.7fgh
29	Sunmate	0.752tij	4.73d-i	12.9qrs	13.6g-n	77.6ijk	4.3def
30	Suntop	0.813tabc	4.91abc	13.2op	13.6g-n	78.6bcd	4.3def
31	Tenfour	0.760ti	4.73d-i	13.3nop	13.2op	76.5n	4.6cde
32	Experimental 8	0.810ta-d	4.80b-f	13.6lmn	13.8b-i	77.7g-k	2.5jkl
33	DS Faraday	0.818ta	4.59g-n	13.6lmn	13.9b-h	76.7mn	3.9fg
34	Ventura	0.743tjk	4.46l-o	13.7klm	13.8b-j	77.6ijk	2.9ijk
35	Viking	0.809ta-e	4.61g-m	13.6lm	14.3a	78.5bcd	4.0ef
36	Wallup	0.796tef	4.48k-n	14.1ghi	14.0a-f	77.7h-k	2.3klm

Impact of *Pratylenchus thornei* on Main Season Wheats

Trial ID: NGA1505 - Main Season Wheat NVT

Location: Macalister

Trial Year: 2015

Crop Scientific Name:		<i>Triticum aestivum</i>					
Crop Name:		Wheat					
Rating Date:		7/09/2015	2/11/2015	2/02/2016	2/02/2016	2/02/2016	2/02/2016
Rating Type:		NDVI	YIELD	PROTEIN	MOISTURE	TEST WEIGHT	SCREENINGS
Rating Unit:		Ratio	t/ha	%	%	kg/hL	%
ARM Action Codes:		AS					
Trt No.	Treatment						
TABLE OF A x B MEANS (Nematode Population x Variety)							
1a	Low Pt, B53	0.814ta-g	4.71d-n	14.0k-p	14.2-	77.8-	3.0-
1b	High Pt, B53	0.809ta-i	4.94a-e	13.7q-u	14.1-	78.0-	2.8-
2a	Low Pt, Baxter	0.811ta-i	4.71d-m	14.4d-k	13.3-	79.2-	1.5-
2b	High Pt, Baxter	0.803tc-m	4.61g-r	14.4d-k	13.5-	79.1-	2.0-
3a	Low Pt, Buchanan	0.787tk-r	4.73c-k	13.2y-C	14.0-	77.0-	3.1-
3b	High Pt, Buchanan	0.767tt-x	4.60g-r	13.1z-D	14.3-	77.5-	2.8-
4a	Low Pt, Condo	0.756tw-z	4.21x-A	14.0l-q	13.7-	77.1-	4.8-
4b	High Pt, Condo	0.748tx-C	4.24w-A	14.0l-q	13.8-	77.4-	5.0-
5a	Low Pt, Crusader	0.754tw-A	4.27u-A	14.4d-j	13.8-	78.2-	2.8-
5b	High Pt, Crusader	0.721tDE	4.24w-A	14.1j-o	13.8-	78.7-	2.4-
6a	Low Pt, Dart	0.744tz-C	4.05zAB	13.8m-r	13.8-	76.0-	5.7-
6b	High Pt, Dart	0.713tEF	3.83B	13.8o-u	13.9-	76.7-	4.9-
7a	Low Pt, Experimental 1	0.735tA-D	4.23x-A	13.6r-w	13.4-	74.0-	5.2-
7b	High Pt, Experimental 1	0.729tCDE	4.34s-y	13.4u-y	13.4-	74.7-	5.1-
8a	Low Pt, Tungsten	0.748tx-C	4.53j-t	14.3f-l	13.5-	77.7-	2.3-
8b	High Pt, Tungsten	0.713tEF	4.47l-x	13.7p-u	13.5-	78.0-	2.3-
9a	Low Pt, Experimental 2	0.812ta-h	4.70d-o	13.9m-r	13.7-	76.7-	2.7-
9b	High Pt, Experimental 2	0.809ta-i	4.79a-i	13.6r-w	13.4-	77.0-	2.7-
10a	Low Pt, Experimental 3	0.793th-q	4.83a-g	13.5s-y	13.1-	73.3-	5.6-
10b	High Pt, Experimental 3	0.760tv-z	4.43q-x	13.5t-y	13.1-	73.6-	4.8-
11a	Low Pt, EGA Wylie	0.826ta	4.98abc	14.5c-h	13.5-	79.5-	2.5-
11b	High Pt, EGA Wylie	0.811ta-i	4.94a-e	14.6a-f	13.1-	79.3-	2.6-
12a	Low Pt, Elmore CL Plus	0.805tb-m	4.58g-s	13.8m-s	13.7-	79.8-	4.2-
12b	High Pt, Elmore CL Plus	0.788tj-r	4.45n-x	13.5t-y	13.6-	79.4-	4.0-
13a	Low Pt, Hartog	0.769tr-w	4.26v-A	13.8n-t	13.9-	77.1-	3.8-
13b	High Pt, Hartog	0.751tw-B	4.34s-y	13.6r-v	13.7-	77.9-	3.6-
14a	Low Pt, Impala	0.764tu-y	4.58g-s	13.7q-u	14.1-	76.9-	2.5-
14b	High Pt, Impala	0.742tz-C	4.25v-A	13.7p-u	14.0-	76.8-	2.5-
15a	Low Pt, Jade	0.803tc-m	4.12yzA	14.5c-g	13.5-	74.8-	5.6-
15b	High Pt, Jade	0.795tg-q	4.09yzA	14.3f-l	13.1-	74.8-	5.2-
16a	Low Pt, Kennedy	0.756tw-z	4.30t-y	14.9a	13.5-	76.3-	3.1-
16b	High Pt, Kennedy	0.700tF	4.02AB	14.6a-e	13.5-	76.9-	3.0-
17a	Low Pt, Kidman	0.821tabc	4.34s-y	14.1i-n	14.1-	77.8-	3.2-
17b	High Pt, Kidman	0.806ta-m	4.66f-q	14.0l-q	13.7-	78.7-	2.7-
18a	Low Pt, Lang	0.824tab	4.43q-x	14.9ab	14.1-	78.6-	2.9-
18b	High Pt, Lang	0.805tb-m	4.11yzA	14.7a-d	14.1-	78.8-	2.9-
19a	Low Pt, Livingston	0.786tm-t	4.45n-x	14.3g-l	13.9-	77.2-	3.5-
19b	High Pt, Livingston	0.767ts-x	4.69e-p	14.1h-m	13.9-	77.5-	3.2-
20a	Low Pt, Experimental 4	0.722tDE	4.88a-f	13.2x-B	13.8-	76.3-	3.5-
20b	High Pt, Experimental 4	0.735tA-D	4.77b-j	13.0z-D	13.8-	77.1-	3.7-
21a	Low Pt, Longreach Reliant	0.779to-v	4.81a-h	13.0A-F	13.9-	78.2-	3.6-
21b	High Pt, Longreach Reliant	0.782tn-u	4.95a-d	12.8DEF	13.6-	78.6-	4.1-
22a	Low Pt, Experimental 5	0.805tb-m	4.60g-r	14.6a-f	13.7-	78.2-	1.9-
22b	High Pt, Experimental 5	0.797tf-o	4.51k-u	14.8abc	13.6-	78.9-	1.8-
23a	Low Pt, QALBis	0.780to-v	4.27u-A	12.7EF	13.3-	71.9-	5.7-
23b	High Pt, QALBis	0.667tG	3.39C	12.6F	13.3-	73.0-	5.5-

Impact of *Pratylenchus thornei* on Main Season Wheats

Trial ID: NGA1505 - Main Season Wheat NVT

Location:

Macalister

Trial Year:

2015

Crop Scientific Name:		<i>Triticum aestivum</i>					
Crop Name:		Wheat					
Rating Date:		7/09/2015	2/11/2015	2/02/2016	2/02/2016	2/02/2016	2/02/2016
Rating Type:		NDVI	YIELD	PROTEIN	MOISTURE	TEST WEIGHT	SCREENINGS
Rating Unit:		Ratio	t/ha	%	%	kg/hL	%
ARM Action Codes:		AS					
Trt No.	Treatment						
24a	Low <i>Pt</i> , Experimental 6	0.807ta-k	4.61g-r	13.2w-A	14.0-	77.5-	3.0-
24b	High <i>Pt</i> , Experimental 6	0.810ta-i	4.90a-f	13.1z-D	14.0-	77.9-	3.7-
25a	Low <i>Pt</i> , Experimental 7	0.796tf-p	4.72d-k	14.4d-i	13.6-	77.2-	1.7-
25b	High <i>Pt</i> , Experimental 7	0.787tl-s	4.39r-x	14.3e-l	13.0-	78.0-	1.9-
26a	Low <i>Pt</i> , Spitfire	0.794tg-q	4.56h-s	14.6b-g	13.6-	79.5-	3.2-
26b	High <i>Pt</i> , Spitfire	0.767ts-x	4.30t-z	14.4d-j	13.5-	79.8-	4.1-
27a	Low <i>Pt</i> , Steel	0.779to-v	5.04a	12.8DEF	13.7-	77.8-	3.9-
27b	High <i>Pt</i> , Steel	0.776tq-v	5.03a	13.0A-E	13.9-	78.4-	4.0-
28a	Low <i>Pt</i> , Sunguard	0.816ta-f	4.71d-n	13.7p-u	13.8-	78.4-	3.4-
28b	High <i>Pt</i> , Sunguard	0.806ta-m	4.71d-m	13.5r-x	13.9-	78.3-	4.0-
29a	Low <i>Pt</i> , Sunmate	0.760tv-z	4.73c-k	12.9C-F	13.6-	77.4-	4.5-
29b	High <i>Pt</i> , Sunmate	0.744ty-C	4.72c-k	13.0A-E	13.5-	77.8-	4.0-
30a	Low <i>Pt</i> , Suntop	0.819ta-d	4.95a-d	13.3v-z	13.8-	78.2-	4.7-
30b	High <i>Pt</i> , Suntop	0.806ta-l	4.88a-f	13.2y-C	13.4-	79.1-	3.8-
31a	Low <i>Pt</i> , Tenfour	0.777tp-v	4.92a-e	13.8n-t	13.4-	76.8-	4.3-
31b	High <i>Pt</i> , Tenfour	0.743tz-C	4.54i-t	12.9B-F	13.1-	76.1-	4.9-
32a	Low <i>Pt</i> , Experimental 8	0.823tabc	4.58g-s	13.6r-v	13.8-	77.0-	2.7-
32b	High <i>Pt</i> , Experimental 8	0.798te-o	5.01ab	13.5s-y	13.9-	78.5-	2.2-
33a	Low <i>Pt</i> , DS Faraday	0.818ta-e	4.49k-w	13.5t-y	13.7-	75.8-	4.4-
33b	High <i>Pt</i> , DS Faraday	0.818ta-e	4.69e-p	13.7q-u	14.1-	77.6-	3.3-
34a	Low <i>Pt</i> , Ventura	0.753tw-A	4.45o-x	13.6r-w	14.1-	77.4-	3.1-
34b	High <i>Pt</i> , Ventura	0.732tB-E	4.46m-x	13.8n-t	13.6-	77.8-	2.7-
35a	Low <i>Pt</i> , Viking	0.809ta-i	4.50k-v	13.7p-u	14.3-	78.2-	4.5-
35b	High <i>Pt</i> , Viking	0.808ta-j	4.71d-l	13.5s-y	14.2-	78.9-	3.6-
36a	Low <i>Pt</i> , Wallup	0.800td-n	4.52j-u	14.1h-m	13.9-	77.7-	2.4-
36b	High <i>Pt</i> , Wallup	0.792ti-q	4.44p-x	14.0l-q	14.1-	77.7-	2.2-

Yield cv = 4.0%

Impact of *Pratylenchus thornei* on Main Season Wheats

Trial ID: NGA1505 - Main Season Wheat NVT

Location:

Macalister

Trial Year:

2015

COMPLETE SPLIT-PLOT AOV <i>Triticum aestivum</i> - Wheat 7/09/2015 NDVI Ratio AS						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	287	0.082427				
R	3	0.005256	0.001752	43.123	0.0001	
A	1	0.004544	0.004544	18.495	0.0231	0.006
ERROR A	3	0.000737	0.000246			
B	35	0.057012	0.001629	40.094	0.0001	0.006
AB	35	0.006346	0.000181	4.463	0.0001	0.009
ERROR B	210	0.008532	0.000041			

COMPLETE SPLIT-PLOT AOV <i>Triticum spp.</i> - Wheat 2/11/2015 YIELD t/ha						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	273	33.594650				
R	3	0.021968	0.007323	0.222	0.8813	
A	1	0.201468	0.201468	1.329	0.3326	0.15
ERROR A	3	0.454948	0.151649			
B	35	22.033536	0.629530	19.053	0.0001	0.18
AB	35	4.406813	0.125909	3.811	0.0001	0.25
ERROR B	196	6.475917	0.033040			

COMPLETE SPLIT-PLOT AOV <i>Triticum aestivum</i> - Wheat 2/02/2016 PROTEIN %						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	287	110.780000				
R	3	0.463333	0.154444	2.451	0.0645	
A	1	1.361250	1.361250	3.888	0.1432	0.2
ERROR A	3	1.050417	0.350139			
B	35	91.252500	2.607214	41.380	0.0001	0.2
AB	35	3.421250	0.097750	1.551	0.0324	0.3
ERROR B	210	13.231250	0.063006			

COMPLETE SPLIT-PLOT AOV <i>Triticum aestivum</i> - Wheat 2/02/2016 MOISTURE %						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	287	55.253194				
R	3	3.619028	1.206343	10.922	0.0001	
A	1	0.516806	0.516806	1.684	0.2852	0.2
ERROR A	3	0.920694	0.306898			
B	35	24.025694	0.686448	6.215	0.0001	0.3
AB	35	2.975694	0.085020	0.770	0.8207	0.5
ERROR B	210	23.195278	0.110454			

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Trial ID: NGA1505 - Main Season Wheat NVT

Location:

Macalister

Trial Year:

2015

COMPLETE SPLIT-PLOT AOV <i>Triticum aestivum</i> - Wheat 2/02/2016 TEST WEIGHT kg/hL						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	287	841.149861				
R	3	20.110417	6.703472	17.878	0.0001	
A	1	13.606806	13.606806	11.736	0.0417	0.4
ERROR A	3	3.478194	1.159398			
B	35	708.534861	20.243853	53.990	0.0001	0.6
AB	35	16.678194	0.476520	1.271	0.1554	0.8
ERROR B	210	78.741389	0.374959			

COMPLETE SPLIT-PLOT AOV <i>Triticum aestivum</i> - Wheat 2/02/2016 SCREENING %						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	287	453.776847				
R	3	5.238734	1.746245	3.726	0.0122	
A	1	1.376417	1.376417	0.468	0.5430	0.6
ERROR A	3	8.824670	2.941557			
B	35	324.181884	9.262340	19.763	0.0001	0.7
AB	35	15.734170	0.449548	0.959	0.5392	0.9
ERROR B	210	98.420970	0.468671			

Rating Type

NDVI = normalized difference vegetation index

ARM Action Codes

AS = Automatic square root transformation of X+0.5

Impact of *Pratylenchus thornei* on Main Season Wheats

Trial ID: NGA1505 - Main Season Wheat NVT

Location:

Macalister

Trial Year:

2015

Pest Scientific Name:		<i>Pratylenchus thornei</i>
Pest Name:		Root-lesion Nematode
Crop Name:		Main Season Wheats
Rating Date:		7/03/2016
Rating Type:		COUNT
Rating Unit:		Pt/g Soil
ARM Action Codes:		AL
Trt No.	Treatment	
1	Low Pt, B53	8.1no
2	Low Pt, Baxter	8.4l-o
3	Low Pt, Buchanan	23.7b-f
4	Low Pt, Condo	13.8g-m
5	Low Pt, Crusader	20.6c-g
6	Low Pt, Dart	17.8e-h
7	Low Pt, Experimental 1	16.5e-j
8	Low Pt, Tungsten	15.8e-k
9	Low Pt, Experimental 2	20.7c-g
10	Low Pt, Experimental 3	25.3a-e
11	Low Pt, EGA Wylie	8.1no
12	Low Pt, Elmore CL Plus	30.7a-d
13	Low Pt, Hartog	10.6i-n
14	Low Pt, Impala	32.7abc
15	Low Pt, Jade	10.2j-n
16	Low Pt, Kennedy	17.6e-i
17	Low Pt, Kidman	19.0d-g
18	Low Pt, Lang	36.1ab
19	Low Pt, Livingston	15.4e-k
20	Low Pt, Experimental 4	16.2e-k
21	Low Pt, Longreach Reliant	14.1g-l
22	Low Pt, Experimental 5	19.1d-g
23	Low Pt, QALBis	40.7a
24	Low Pt, Experimental 6	16.9e-j
25	Low Pt, Experimental 7	23.7b-f
26	Low Pt, Spitfire	15.2f-k
27	Low Pt, Steel	7.8no
28	Low Pt, Sunguard	15.6e-k
29	Low Pt, Sunmate	9.7k-o
30	Low Pt, Suntop	5.9o
31	Low Pt, Tenfour	12.6g-n
32	Low Pt, Experimental 8	17.3e-i
33	Low Pt, DS Faraday	13.1g-n
34	Low Pt, Ventura	10.7h-n
35	Low Pt, Viking	8.4mno
36	Low Pt, Wallup	14.8f-k
LSD P=		0.21t
Treatment Prob.(F)=		0.0001

Means followed by same letter do not significantly differ ($P=.05$, LSD)

Mean separations are based on the complete error term.

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

ARM Action Codes

AL = Automatic log transformation of X+1