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## Impact of *Pratylenchus thornei* on Durum

**Trial ID: NGA1503 - Durum NVT**
**Location:**
**Macalister**
**Trial Year: 2015**
**Investigator:**
**Linda Bailey**

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

Low *Pt* = Low population density of *P thornei*

High *Pt* = High population density of *P thornei*

| <b>Crop Scientific Name:</b>                                |                                 | <b><i>Triticum durum</i></b> |                  |                  |                  |                    |                   |
|-------------------------------------------------------------|---------------------------------|------------------------------|------------------|------------------|------------------|--------------------|-------------------|
| <b>Crop Name:</b>                                           |                                 | <b>Durum Wheat</b>           |                  |                  |                  |                    |                   |
| <b>Rating Date:</b>                                         |                                 | <b>7/09/2015</b>             | <b>2/11/2015</b> | <b>3/02/2016</b> | <b>3/02/2016</b> | <b>3/02/2016</b>   | <b>3/02/2016</b>  |
| <b>Rating Type:</b>                                         |                                 | <b>NDVI</b>                  | <b>YIELD</b>     | <b>PROTEIN</b>   | <b>MOISTURE</b>  | <b>TEST WEIGHT</b> | <b>SCREENINGS</b> |
| <b>Rating Unit:</b>                                         |                                 | <b>Ratio</b>                 | <b>t/ha</b>      | <b>%</b>         | <b>%</b>         | <b>kg/hL</b>       | <b>%</b>          |
| <b>ARM Action Codes:</b>                                    |                                 |                              |                  |                  |                  | <b>ET7</b>         | <b>AA</b>         |
| <b>Trt No.</b>                                              | <b>Treatment</b>                |                              |                  |                  |                  |                    |                   |
| <b>TABLE OF A MEANS (Nematode Population)</b>               |                                 |                              |                  |                  |                  |                    |                   |
| 1                                                           | Low <i>Pt</i>                   | 0.810a                       | 5.00-            | 13.9-            | 12.8-            | 75.1-              | 2.6-              |
| 2                                                           | High <i>Pt</i>                  | 0.790b                       | 4.88-            | 13.9-            | 12.8-            | 76.0-              | 2.4-              |
| <b>TABLE OF B MEANS (Variety)</b>                           |                                 |                              |                  |                  |                  |                    |                   |
| 1                                                           | DBA Bindaroi                    | 0.799c                       | 5.26bc           | 13.8d            | 12.9ab           | 77.3a              | 1.8ef             |
| 2                                                           | DBA Lillaroi                    | 0.785d                       | 4.61d            | 14.7ab           | 12.7d            | 76.3ab             | 2.5d              |
| 3                                                           | DBA Vittaroi                    | 0.759e                       | 4.36e            | 14.1c            | 12.7cd           | 75.5bc             | 2.0e              |
| 4                                                           | Experimental 1                  | 0.805bc                      | 4.73d            | 13.7d            | 12.8bc           | 74.9c              | 3.2b              |
| 5                                                           | Caparoi                         | 0.819a                       | 5.34ab           | 13.6de           | 12.9ab           | 77.3a              | 1.6f              |
| 6                                                           | DBA-Aurora                      | 0.820a                       | 5.54a            | 13.1f            | 13.0ab           | 74.7c              | 3.8a              |
| 7                                                           | EGA Bellaroi                    | 0.816ab                      | 4.67d            | 14.5b            | 12.4f            | 73.3d              | 2.6cd             |
| 8                                                           | Hyperno                         | 0.821a                       | 5.39ab           | 13.3ef           | 13.0a            | 76.4ab             | 2.9bc             |
| 9                                                           | Jandaroi                        | 0.768e                       | 4.37e            | 14.8a            | 12.5ef           | 77.0a              | 1.1g              |
| 10                                                          | Tjilkuri                        | 0.808abc                     | 5.12c            | 13.6de           | 12.6de           | 72.7d              | 3.9a              |
| <b>TABLE OF A x B MEANS (Nematode Population x Variety)</b> |                                 |                              |                  |                  |                  |                    |                   |
| 1a                                                          | Low <i>Pt</i> , DBA Bindaroi    | 0.813-                       | 5.34ab           | 13.8-            | 12.9-            | 77.0-              | 2.0-              |
| 1b                                                          | High <i>Pt</i> , DBA Bindaroi   | 0.785-                       | 5.17bc           | 13.8-            | 12.9-            | 77.6-              | 1.7-              |
| 2a                                                          | Low <i>Pt</i> , DBA Lillaroi    | 0.805-                       | 4.90cd           | 14.7-            | 12.8-            | 76.4-              | 2.2-              |
| 2b                                                          | High <i>Pt</i> , DBA Lillaroi   | 0.765-                       | 4.33g            | 14.7-            | 12.6-            | 76.1-              | 2.7-              |
| 3a                                                          | Low <i>Pt</i> , DBA Vittaroi    | 0.763-                       | 4.35g            | 14.1-            | 12.7-            | 75.5-              | 1.9-              |
| 3b                                                          | High <i>Pt</i> , DBA Vittaroi   | 0.755-                       | 4.38fg           | 14.0-            | 12.8-            | 75.5-              | 2.0-              |
| 4a                                                          | Low <i>Pt</i> , Experimental 1  | 0.811-                       | 4.79de           | 13.6-            | 12.8-            | 74.5-              | 3.3-              |
| 4b                                                          | High <i>Pt</i> , Experimental 1 | 0.799-                       | 4.67def          | 13.8-            | 12.9-            | 75.4-              | 3.1-              |
| 5a                                                          | Low <i>Pt</i> , Caparoi         | 0.831-                       | 5.33ab           | 13.8-            | 12.9-            | 76.6-              | 1.8-              |
| 5b                                                          | High <i>Pt</i> , Caparoi        | 0.807-                       | 5.34ab           | 13.4-            | 12.9-            | 78.1-              | 1.3-              |
| 6a                                                          | Low <i>Pt</i> , DBA-Aurora      | 0.827-                       | 5.45ab           | 13.2-            | 13.0-            | 73.9-              | 3.9-              |
| 6b                                                          | High <i>Pt</i> , DBA-Aurora     | 0.813-                       | 5.63a            | 13.0-            | 13.0-            | 75.4-              | 3.6-              |
| 7a                                                          | Low <i>Pt</i> , EGA Bellaroi    | 0.830-                       | 4.78de           | 14.6-            | 12.5-            | 72.3-              | 2.9-              |
| 7b                                                          | High <i>Pt</i> , EGA Bellaroi   | 0.801-                       | 4.55efg          | 14.5-            | 12.4-            | 74.4-              | 2.2-              |
| 8a                                                          | Low <i>Pt</i> , Hyperno         | 0.825-                       | 5.40ab           | 13.3-            | 13.0-            | 75.9-              | 3.1-              |
| 8b                                                          | High <i>Pt</i> , Hyperno        | 0.816-                       | 5.38ab           | 13.3-            | 13.0-            | 76.9-              | 2.7-              |
| 9a                                                          | Low <i>Pt</i> , Jandaroi        | 0.774-                       | 4.31g            | 14.8-            | 12.5-            | 77.0-              | 1.2-              |
| 9b                                                          | High <i>Pt</i> , Jandaroi       | 0.761-                       | 4.43fg           | 14.9-            | 12.5-            | 77.1-              | 1.0-              |
| 10a                                                         | Low <i>Pt</i> , Tjilkuri        | 0.817-                       | 5.31b            | 13.5-            | 12.6-            | 71.7-              | 3.9-              |
| 10b                                                         | High <i>Pt</i> , Tjilkuri       | 0.798-                       | 4.94cd           | 13.6-            | 12.7-            | 73.7-              | 3.9-              |

Yield cv = 4.3%

## Impact of *Pratylenchus thornei* on Durum

Trial ID: NGA1503 - Durum NVT

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Macalister

Trial Year: 2015

| <b>COMPLETE SPLIT-PLOT AOV</b><br><b><i>Triticum durum</i> - Durum Wheat</b><br><b>7/09/2015</b><br><b>NDVI Ratio</b> |    |                |             |        |          |           |
|-----------------------------------------------------------------------------------------------------------------------|----|----------------|-------------|--------|----------|-----------|
| Source                                                                                                                | DF | Sum of Squares | Mean Square | F      | Prob.(F) | LSD (.05) |
| Total                                                                                                                 | 79 | 0.059816       |             |        |          |           |
| R                                                                                                                     | 3  | 0.003055       | 0.001018    | 5.392  | 0.0026   |           |
| A                                                                                                                     | 1  | 0.007657       | 0.007657    | 24.925 | 0.0155   | 0.012     |
| ERROR A                                                                                                               | 3  | 0.000922       | 0.000307    |        |          |           |
| B                                                                                                                     | 9  | 0.035990       | 0.003999    | 21.172 | 0.0001   | 0.014     |
| AB                                                                                                                    | 9  | 0.001994       | 0.000222    | 1.173  | 0.3309   | 0.019     |
| ERROR B                                                                                                               | 54 | 0.010199       | 0.000189    |        |          |           |

| <b>COMPLETE SPLIT-PLOT AOV</b><br><b><i>Triticum durum</i> - Durum Wheat</b><br><b>2/11/2015</b><br><b>Yield t/ha</b> |    |                |             |        |          |           |
|-----------------------------------------------------------------------------------------------------------------------|----|----------------|-------------|--------|----------|-----------|
| Source                                                                                                                | DF | Sum of Squares | Mean Square | F      | Prob.(F) | LSD (.05) |
| Total                                                                                                                 | 79 | 17.792919      |             |        |          |           |
| R                                                                                                                     | 3  | 0.144765       | 0.048255    | 1.063  | 0.3725   |           |
| A                                                                                                                     | 1  | 0.265041       | 0.265041    | 10.118 | 0.0501   | 0.12      |
| ERROR A                                                                                                               | 3  | 0.078588       | 0.026196    |        |          |           |
| B                                                                                                                     | 9  | 13.912469      | 1.545830    | 34.054 | 0.0001   | 0.21      |
| AB                                                                                                                    | 9  | 0.940773       | 0.104530    | 2.303  | 0.0285   | 0.30      |
| ERROR B                                                                                                               | 54 | 2.451282       | 0.045394    |        |          |           |

| <b>COMPLETE SPLIT-PLOT AOV</b><br><b><i>Triticum durum</i> - Durum Wheat</b><br><b>3/02/2016</b><br><b>PROTEIN %</b> |    |                |             |        |          |           |
|----------------------------------------------------------------------------------------------------------------------|----|----------------|-------------|--------|----------|-----------|
| Source                                                                                                               | DF | Sum of Squares | Mean Square | F      | Prob.(F) | LSD (.05) |
| Total                                                                                                                | 78 | 31.217722      |             |        |          |           |
| R                                                                                                                    | 3  | 1.217167       | 0.405722    | 5.061  | 0.0037   |           |
| A                                                                                                                    | 1  | 0.068056       | 0.068056    | 1.131  | 0.3656   | 0.2       |
| ERROR A                                                                                                              | 3  | 0.180500       | 0.060167    |        |          |           |
| B                                                                                                                    | 9  | 25.054667      | 2.783852    | 34.724 | 0.0001   | 0.3       |
| AB                                                                                                                   | 9  | 0.448333       | 0.049815    | 0.621  | 0.7735   | 0.4       |
| ERROR B                                                                                                              | 53 | 4.249000       | 0.080170    |        |          |           |

| <b>COMPLETE SPLIT-PLOT AOV</b><br><b><i>Triticum durum</i> - Durum Wheat</b><br><b>3/02/2016</b><br><b>MOISTURE %</b> |    |                |             |        |         |           |
|-----------------------------------------------------------------------------------------------------------------------|----|----------------|-------------|--------|---------|-----------|
| Source                                                                                                                | DF | Sum of Squares | Mean Square | F      | Prob(F) | LSD (.05) |
| Total                                                                                                                 | 78 | 3.710222       |             |        |         |           |
| R                                                                                                                     | 3  | 0.101000       | 0.033667    | 1.793  | 0.1597  |           |
| A                                                                                                                     | 1  | 0.000222       | 0.000222    | 0.118  | 0.7542  | 0.0       |
| ERROR A                                                                                                               | 3  | 0.005667       | 0.001889    |        |         |           |
| B                                                                                                                     | 9  | 2.414667       | 0.268296    | 14.291 | 0.0001  | 0.1       |
| AB                                                                                                                    | 9  | 0.193667       | 0.021519    | 1.146  | 0.3482  | 0.2       |
| ERROR B                                                                                                               | 53 | 0.995000       | 0.018774    |        |         |           |

## Impact of *Pratylenchus thornei* on Durum

Trial ID: NGA1503 - Durum NVT

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Macalister

Trial Year:

2015

| <b>COMPLETE SPLIT-PLOT AOV</b><br><b><i>Triticum durum</i> - Durum Wheat</b><br><b>3/02/2016</b><br><b>TEST WEIGHT kg/hL ET7</b> |    |                |             |        |          |           |
|----------------------------------------------------------------------------------------------------------------------------------|----|----------------|-------------|--------|----------|-----------|
| Source                                                                                                                           | DF | Sum of Squares | Mean Square | F      | Prob.(F) | LSD (.05) |
| Total                                                                                                                            | 78 | 327.251056     |             |        |          |           |
| R                                                                                                                                | 3  | 10.296167      | 3.432056    | 2.058  | 0.1169   |           |
| A                                                                                                                                | 1  | 17.734722      | 17.734722   | 5.891  | 0.0936   | 1.2       |
| ERROR A                                                                                                                          | 3  | 9.032167       | 3.010722    |        |          |           |
| B                                                                                                                                | 9  | 189.207167     | 21.023019   | 12.606 | 0.0001   | 1.3       |
| AB                                                                                                                               | 9  | 12.592500      | 1.399167    | 0.839  | 0.5839   | 1.8       |
| ERROR B                                                                                                                          | 53 | 88.388333      | 1.667704    |        |          |           |

| <b>COMPLETE SPLIT-PLOT AOV</b><br><b><i>Triticum durum</i> - Durum Wheat</b><br><b>3/02/2016</b><br><b>SCREENINGS % AA</b> |    |                |             |        |          |           |
|----------------------------------------------------------------------------------------------------------------------------|----|----------------|-------------|--------|----------|-----------|
| Source                                                                                                                     | DF | Sum of Squares | Mean Square | F      | Prob.(F) | LSD (.05) |
| Total                                                                                                                      | 78 | 266.555629     |             |        |          |           |
| R                                                                                                                          | 3  | 0.317780       | 0.105927    | 0.208  | 0.8903   |           |
| A                                                                                                                          | 1  | 2.994448       | 2.994448    | 3.435  | 0.1609   | 0.7       |
| ERROR A                                                                                                                    | 3  | 2.615220       | 0.871740    |        |          |           |
| B                                                                                                                          | 9  | 227.201728     | 25.244636   | 49.613 | 0.0001   | 0.7       |
| AB                                                                                                                         | 9  | 6.458457       | 0.717606    | 1.410  | 0.2075   | 1.0       |
| ERROR B                                                                                                                    | 53 | 26.967996      | 0.508830    |        |          |           |

### Rating Type

NDVI = Normalized difference vegetation index

### ARM Action Codes

ET7 = Excluded treatment 7

AA = Automatic arcsine square root % transformation

## Impact of *Pratylenchus thornei* on Durum

Trial ID: NGA1503 - Durum NVT

Location:

Macalister

Trial Year:

2015

| Scientific Pest Name: |                        | <i>Pratylenchus thornei</i> |
|-----------------------|------------------------|-----------------------------|
| Pest Name:            |                        | Root-lesion Nematode        |
| Crop Name:            |                        | Durum Wheat                 |
| Rating Date:          |                        | 7/03/2016                   |
| Rating Type           |                        | COUNT                       |
| Rating Unit:          |                        | Pt/g Soil                   |
| ARM Action Codes:     |                        | AL                          |
| Trt No.               | Treatment              |                             |
| 1                     | Low Pt, DBA Bindaroi   | 5.2bc                       |
| 2                     | Low Pt, DBA Lillaroi   | 4.2bc                       |
| 3                     | Low Pt, DBA Vittaroi   | 7.1ab                       |
| 4                     | Low Pt, Experimental 1 | 3.0c                        |
| 5                     | Low Pt, Caparoi        | 3.9bc                       |
| 6                     | Low Pt, DBA-Aurora     | 4.6bc                       |
| 7                     | Low Pt, EGA Bellaroi   | 4.0bc                       |
| 8                     | Low Pt, Hyperno        | 3.1c                        |
| 9                     | Low Pt, Jandaroi       | 12.4a                       |
| 10                    | Low Pt, Tjilkuri       | 4.9bc                       |
| 18                    | High Pt, Hyperno       | 11.5a                       |
| LSD P=                |                        | 0.23t                       |
| Treatment Prob.(F)=   |                        | 0.0002                      |

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