*Supplementary information*

**Table S1**. Means and LSD for Wet Gluten for both varieties at different N application rates at sowing for both seasons.

|  |  |  |
| --- | --- | --- |
| **Variety** | **Season** | **Nrate (kg/ha)** |
|  |  | **0** | **50** | **100** | **150** | **200** |
| Jandaroi | 2020 | 32.04aA | 32.12aA | 33.04aA | 34.19aBC | 34.52aC |
| DBA Lillaroi |  | 34.72bBC | 34.62bBC | 36.09bD | 36.59bD | 38.11bE |
| LSD |  | 1.029 |
|  |  | **0** | **20** | **40** | **80** | **160** |
| Jandaroi | 2021 | 21.74aA | 22.34aA | 23.58aB | 25.08aC | 28.03aD |
| DBA Lillaroi |  | 20.99aA | 21.88aA | 23.45aB | 25.15aC | 29.20bD |
| LSD |  | 1.126 |

For each season, values with the same lowercase letter in the same column are not significantly different and values with the same upper case letter in the same row are not significantly different, *p<0.05*.

**Table S2.** Means and LSD for screenings for both varieties at different FCR inoculation rates at sowing for both seasons.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variety** | **Season** | **FCR Inoculation (g/m)** |  |
|  |  | **0** | **0.5** | **2.0** |
| Jandaroi | 2020 | 2.88aA | 4.99aB | 4.97aB |
| DBA Lillaroi |  | 3.18aA | 3.8bA | 3.56bA |
| LSD |  | 0.976 |  |
|  |  | **0** | **0.75** | **1.5** |
| Jandaroi | 2021 | 0.83aA | 0.96aB | 0.95aB |
| DBA Lillaroi |  | 0.97bA | 0.97aA | 1.06aA |
| LSD |  | 0.127 |  |

For each season, values with the same lowercase letter in the same column are not significantly different and values with the same upper case letter in the same row are not significantly different, *p<0.05*.

**Table S3.** Means and LSD for SY for both varieties at different disease application rates - Tamworth 2020.

|  |  |
| --- | --- |
| **Variety** | **FCR Inoculation (g/m)** |
|  | 0 | 0.5 | 2.0 |
| Jandaroi | 73.96a | 73.79a | 73.95a |
| DBA Lillaroi | 75.16b | 75.27b | 75.69c |
| LSD | 0.325 |

Different letters in the same column indicate statistically significant differences at *p* < 0.05.

**Table S4**. Means and LSD for GI, MPT and RBD for both varieties at different inoculation application - Tamworth 2020.

|  |  |  |
| --- | --- | --- |
| **Variety** | **Dough measure** | **FCR Inoculation (g/m)** |
|  |  | 0 | 0.5 | 2.0 |
| Jandaroi | MPT | 3.45b | 3.24a | 3.22a |
| DBA Lillaroi |  | 2.78c | 2.71c | 2.72c |
| LSD |  | 0.124 |
|  |  |  |  |  |
| Jandaroi | RBD | 47.5a | 47.8a | 50a |
| DBA Lillaroi |  | 50.6c | 56.2b | 58.5b |
| LSD |  | 4.095 |
|  |  |  |  |  |
| Jandaroi | GI | 92.9b | 86.6a | 83.1a |
| DBA Lillaroi |  | 67.7d | 57.1c | 53.8c |
| LSD |  | 3.88 |

Different letters in the same column indicate statistically significant differences at *p* < 0.05.

**Table S5**. Means and LSD for % Fusarium infection for both varieties at different disease application rates - Tamworth 2021.

|  |  |
| --- | --- |
| **Variety** | **FCR Inoculation (g/m)** |
|  | **0** | **0.75** | **1.5** |
| Jandaroi | 1.60aA | 45.60aB | 69.40aC |
| DBA Lillaroi | 1.40aA | 49.40bB | 69.60aC |
| LSD | 3.03 |

Values with the same lowercase letter in the same column are not significantly different and values with the same upper case letter in the same row are not significantly different, *p<0.05*.

**Table S6**. Means and LSD for % Fusarium infection for both varieties at different disease and nitrogen application rates - Tamworth 2020.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variety** | **Disease****(g/m)** |  | **Nrate (kg/ha)** |
|  |  |  | 0 | 50 | 100 | 150 | 200 |
| Jandaroi | 0 |  | 2.0aA | 6.0aA | 7.0aA | 6.0aA | 6.0aA |
|  | 0.5 |  | 30.0bA | 32.0bA | 46.0bB | 45.0bB | 54.0bC |
|  | 2.0 |  | 72.0cA | 72.0cA | 76.0cAB | 80.0cAB | 83.0cB |
| DBA Lillaroi | 0 |  | 5.0aA | 6.3aA | 4.0aA | 7.3aA | 4.0aA |
|  | 0.5 |  | 38.0bA | 42.0dA | 47.0bAB | 53.0bBC | 58.0bC |
|  | 2.0 |  | 75.0cA | 77.0cAB | 85.0cBC | 86.0cBC | 89.0cC |
| LSD |  |  | 9.08 |

Values with the same lowercase letter in the same column are not significantly different and values with the same upper case letter in the same row are not significantly different, *p<0.05*.

**Table S7**. Mean SE-HLPC data for two durum wheat varieties at 4N rates and 2 CR inoculations in mature grain from 2021 season.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variety** | **N rate****(kg/ha)** | **CR****(g/m)** | **P/M** | **Gli/Glu** | **UPP%** | **%SolA** | **%SolB** | **%SolC** | **%InsolA** | **%InsolB** | **%InsolC** | **Total Area** |
| Jandaroi | 0 | 0 | 1.01 | 0.74a | 28.47 | 35.79 | 34.46a | 12.62 | 14.19e | 2.21 | 0.72 | 43752809 |
| Jandaroi | 0 | 1.5 | 1.02 | 0.73a | 25.36 | 37.71 | 34.82ab | 11.88 | 12.77de | 2.13 | 0.70 | 43620193 |
| Jandaroi | 40 | 0 | 0.95 | 0.78abc | 25.47 | 36.16 | 35.23abcd | 13.33 | 12.34cd | 2.17 | 0.76 | 44883926 |
| Jandaroi | 40 | 1.5 | 0.97 | 0.76ab | 27.62 | 35.58 | 34.95abc | 12.93 | 13.54de | 2.23 | 0.76 | 44816265 |
| Jandaroi | 80 | 0 | 0.96 | 0.78abc | 26.17 | 36.12 | 35.71abcdef | 12.64 | 12.71de | 2.13 | 0.69 | 46813416 |
| Jandaroi | 80 | 1.5 | 0.91 | 0.82bc | 26.25 | 34.92 | 36.28cdefg | 13.71 | 12.32cd | 2.10 | 0.67 | 47870491 |
| Jandaroi | 160 | 0 | 0.98 | 0.78abc | 28.04 | 35.52 | 36.11bcdefg | 11.51 | 13.85de | 2.32 | 0.69 | 54017130 |
| Jandaroi | 160 | 1.5 | 0.90 | 0.83bc | 27.49 | 34.24 | 36.64efgh | 13.11 | 13.04de | 2.25 | 0.71 | 52463957 |
| DBA Lillaroi | 0 | 0 | 0.94 | 0.78abc | 19.40 | 39.05 | 36.11bcdefg | 13.01 | 9.37ab | 1.80 | 0.66 | 43496710 |
| DBA Lillaroi | 0 | 1.5 | 0.90 | 0.79abc | 21.22 | 37.14 | 35.03abcd | 15.36 | 9.93ab | 1.84 | 0.71 | 41210808 |
| DBA Lillaroi | 40 | 0 | 0.96 | 0.76ab | 19.34 | 39.42 | 35.48abcde | 13.37 | 9.45ab | 1.69 | 0.59 | 42665147 |
| DBA Lillaroi | 40 | 1.5 | 0.92 | 0.80abc | 19.13 | 38.69 | 36.34defgh | 13.45 | 9.12ab | 1.76 | 0.64 | 43772307 |
| DBA Lillaroi | 80 | 0 | 0.86 | 0.84c | 19.43 | 37.18 | 37.01fgh | 14.59 | 8.89a | 1.72 | 0.61 | 46187819 |
| DBA Lillaroi | 80 | 1.5 | 0.92 | 0.81bc | 18.85 | 38.94 | 37.39gh | 12.57 | 9.01a | 1.55 | 0.54 | 46761999 |
| DBA Lillaroi | 160 | 0 | 0.94 | 0.82bc | 22.29 | 37.71 | 37.69h | 11.07 | 10.79bc | 2.09 | 0.64 | 52503063 |
| DBA Lillaroi | 160 | 1.5 | 0.90 | 0.84c | 21.40 | 37.01 | 37.70h | 12.65 | 10.12ab | 1.91 | 0.62 | 51863401 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | LSD | 0.113 | 0.0711 | 3.37 | 2.996 | 1.379 | 2.942 | 1.761 | 0.238 | 0.046 |  |
|  | Fpr | V | <0.05 | <0.05 | <.001 | <.001 | <.001 | ns | <.001 | <.001 | <.001 |  |
|  |  | Nrate | ns | <0.05 | ns | ns | <.001 | ns | <0.05 | <0.05 | ns |  |
|  |  | CR | ns | ns | ns | ns | ns | ns | ns | ns | ns |  |
|  |  | Interactions | ns | ns | ns | ns | ns | ns | ns | ns | ns |  |

Numbers with alike lower case letters in the same column are not significantly different, *p* <0.05. Fpr=probability for significance and level for each factor.



 J2 J0.5 J0 L2 L0.5 L0 J1.5 J0.75 J0 L1.5 L0.75 L0

 2020 2021

**LSD**

**LSD**

**Figure S1**. Boxplot showing gluten index (GI) for both varieties at different CR inoculation rates (g/m) for 2020 and 2021 seasons. LSD statistic shown for each year