**Final Technical Report Template**

**2018-19**

**Final Technical Report**

**‘Yardstick’ Demonstrations for the Kwinana West and Kwinana East port zones**

|  |  |
| --- | --- |
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Does the report have any of the following sensitivities?

Intended for journal publication YES/**NO**

Results are incomplete YES/**NO**

Commercial/IP concerns YES/**NO**

Embargo date YES/**NO** DATE 31/03/2020

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**Contents**

[**Contents 3**](#_Toc391973455)

**Key messeges…………………………………………………………………………………………………………….4**

**Summary…………………………………………………………………………………………………………………...4**

[**Background 5**](#_Toc391973456)

[**Project objectives 6**](#_Toc391973457)

[**Methodology 7**](#_Toc391973458)

**Location…………………………………………………………………………………………………………………….9**

[**Results 10**](#_Toc391973459)

[**Conclusion 16**](#_Toc391973461)

**Appendix 1………………………………………………………………………………………………………………15**

**Economical analysis 2018 17**

**Economical analysis 2019 ………………………………………………………………………………………..24**

**Appendix 2 …………………..…………………………………………………………………………………………34**

**Appendix 2A: Reports per site 2018......................................…………………………………………………….34**

**Appendix 2B: Reports per site 2019......................................…………………………………………………….103**

**KEY MESSAGES**

* In both years, variety was ultimately the driver of yield
* In 2018 regardless of the crop type, there was a nitrogen rate response. While in 2019, only in Corrigin and Merredin nitrogen rate responses were observed.
* In 2018 wheat provided the most stable yield. Hence in a dryer season such as 2019, wheat showed higher yield results compared with barley.

**SUMMARY**

In 2018 across all 8 sites, variety choice was ultimately the driver of yield. Moreover, in 2019 variety was the main driver in 7 of the 8 wheat trial site locations and 6 of the 9 barley sites.

In 2018 a consistent response was observed to nitrogen rate application, regardless of the crop type. However, in 2019 deciles or nitrogen strategy had limited influence. In fact, significant yield increases were found at Corrigin and Merredin for wheat and barley. Moreover, the nitrogen strategies influenced grain protein at 4 of the 8 sites.

For 2018, in the higher rainfall areas, the nitrogen rates were too low to achieve yield potential, while in marginal areas, the nitrogen rates were more appropriate. This evidences the need for individual site-specific nitrogen rates rather than a blanket rate across the protocol for the whole project. Likewise, in 2019 higher deciles (decile 7) ensured the Corrigin and Merredin sites were better able to achieve their yield potential. However, given the low rainfall season many of the sites were unable to reach yields close to their potential. In general, in 2019, the WA wheatbelt experienced rainfall most like decile 1-3 therefore highlighting the conservative approach to a nitrogen strategy.

As expected, wheat was generally the most stable yielder across the sites in 2019, however the difference was not as great as observed in 2018.

In both years barley suffered from a dry September when filling grain (as shown by the high screenings) and could not recover as well as wheat following the late rain in 2018. Thus, in 2019 most varieties across the trial sites only received a feed barley classification.

In 2018 canola emerged late (due to the late start of the season) and benefited from the October rain to achieve good yields. This response may be different in a season with a tighter finish.

**Background**

As identified by growers through various GRDC RCSN open forums - tight budgets and variable seasons have resulted in a desire to revisit standard fertiliser practices, crop types and varieties.

As such the Yardstick trials have several aims:

1. What crop type gives the best economic return? Wheat, barley or canola?
2. Do different varieties respond differently to different nutrition packages?
3. To cross reference with the National Variety Trials, which generally have higher levels of fertiliser applied due to their aim of identifying the highest yielding germplasm, free from nutritional or budgetary constraints

In 2018, reflecting the initial protocol developed by growers in the low rainfall zone of the central wheatbelt, rates have remained low.

In the trial of 2018 two rates of phosphorus were tested - either 0 Units or 5 units. There are 3 rates of nitrogen applied- 0 units, 10, 30 or 50 (the latter being split). Two varieties of canola, wheat and barley are included in this trial.

Based on the learnings of the initial year, the protocol developed for 2019 focused on a targeted approach for nitrogen strategies per trial site. Each site had a yield prophet scenario run, with best practice nitrogen strategies implemented at either a decile 1, 4 or 7, with increasing deciles allowing for increased nitrogen application. Individual site units of N are presented in the site reports found in the appendix.

Again, building on the work undertaken in 2018 the 2019 component of the research focused on wheat and barley trials, with 4 widely adapted varieties of each selected.

**Project objectives**

The primary aim of the ‘Yardstick’ project is to conduct a series of agronomic demonstrations that will assist growers in making crop type, varietal and nitrogen decisions. The project was conducted in wheat, barley and canola in 2018 and wheat and barley in 2019.

By April 2020, growers will have access to reliable local ‘Yardstick’ information that will enable them to make decisions on management packages and crop types that suit their farming systems.

**Methodology**

In 2018, following consultation with local grower groups, a standard protocol was developed to assess 2 wheat, barley and canola varieties across different fertilizer strategies. In 2019, 4 wheat and barley varieties were sown across different rainfall deciles.

The trial was sown using a small plot research seeder, in a complete randomised block. Plot sizes were 10 m x 1.6 m with row spacings of 25.4 cm.

|  |  |
| --- | --- |
| **Varieties in 2018**  Wheat: Scepter and Trojan  Barley: LaTrobe and Bass  Canola: Hyola 559 and Invigor T4510 | **Varieties in 2019**  Wheat: Scepter, Trojan, Devil, Ninja  Barley: Rosalind, Buff, Spartacus, Planet |
| **Fertilizer treatments tested in 2018**   |  |  |  |  | | --- | --- | --- | --- | |  | **N (Pre)** | **N (Post)** | **P** | | **Decile 0** | 0 | 0 | 0 | | **Decile 3** | 10 | 0 | 5 | | **Decile 6** | 30 | 0 | 5 | | **Play Season** | 30 | 20 | 5 |   N applied pre-emergent was sown below the seed in the form of urea  P applied pre-emergent was sown below the seed in the form of Triple Super Phosphate (TSP)  N applied post emergent was applied as a foliar application in the form of UAN (liquid nitrogen). | **Fertilizer treatments tested in 2019**  Decile 1, 4 and 7 were specific per site. Individual site nitrogen rates are presented in the site reports.  Nitrogen applied pre-emergent was sown below the seed in the form of compound N, P, K fertilizer.  Nitrogen applied post emergent was applied as a foliar application in the form of UAN (liquid nitrogen) during late tillering.  Note: Cunderdin wheat and barley site had the deciles increased to decile 4, 7 and 9 following a spray application error. |

**Assessment data scoring**

*Establishment*

The number of seedlings emerged from 4 individual 1-meter rows were counted and converted to plants/m2 based on 25.4 cm row spacing.

*Vigour*

A visual subjective assessment of post-emergent seedling vigour was made using a 0-9 rating scale, where 0 = no vigour and 9 = highly vigorous plot.

*Emergence*

A visual subjective assessment of post-emergent seedling emergence was made using a 0-9 rating scale, where 0 = no crop emerged and 9 = all plants emerged within the plot.

*Tiller count*

Within each plot, 20 plants were selected at random and the number of tillers present on each plant were recorded and presented as number of tillers per plant.

*NDVI*

NDVI, or Normalised Difference Vegetation Index, is used to measure green living vegetation. It is a numerical indicator that uses the visible and near infra-red bands of the electromagnetic spectrum Typical NDVI values from bare earth are around 0.2000 while recordings from healthy crops with full ground cover can range between 0.5000 to 0.8000.

*Days to Z61/days to 50% flowering*

A visual subjective assessment of growth stage was made for each individual plot at or near to the time of Z61 (cereals) or 50% flowering (canola) this was then converted to “days to Z61” and “days to 50% flowering”

*Floret sterility*

Once cereal varieties reached Z83, 30 random heads were selected within each plot for determination of floret sterility. The method used was developed through the National Frost Initiative. Data presented is % sterility.

At each site, one replicate was assessed for sterility to determine if frost damage was present. Provided high enough levels of frost damage were evident, the entire site was processed and statistical analysis completed. In sites were low levels of damage was present, data presented is of replicate one only.

*Yield*

Plots were harvested with a Haldrup trial header and the weights in kg/plot recorded, then converted to t/ha using measured plot dimensions.

*Grain quality*

Grain samples from each harvested plot were analysed for protein (%) and oil (%) using an Infratech (Perten Inframatic IM9500). Hectolitre weight (kg/hL) and screenings (%) were conducted using a chronometer and GTA approved sieves.

**Data Analysis:**

A factorial analysis was used to determine statistical significance of the two factors within the trial (variety and fertilizer rates) at a 95% confidence level.

**Location**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trial** | **2018** | | **2019** | |
| **Site** | **GPS coordinates** | **Site** | **GPS coordinates** |
| **# 1** | **Corrigin** | -32.3447657  117.896492 | **Corrigin** | -32.342784 117.906308 |
| **# 2** | **Cunderdin** | 31.566149  117.263189 | **Cunderdin** | -31.566652 117.271939 |
| **# 3** | **Kalannie** | 30.3536131  117.0711561 | **Merredin** | -31.716709 118.578159 |
| **# 4** | **Merredin**  **Muntagin** | 31.7157341  118.597877 | **Moorine Rock** | -31.411121 119.126092 |
| **# 5** | **Moorine Rock** | 31.4632879  119.408928 | **Mukinbudin** | -30.514414 118.123953 |
| **# 6** | **Mukinbudin** | 30.8651928  118.211069 | **Tincurrin** | -32.964708 117.771526 |
| **# 7** | **Yealering** | 32.490594  117.579755 | **Wyalkatchem** | -31.06156023 117.2983691 |
| **# 8** | **York** | 31.82445  117.016534 | **York** | -31.840387 116.886083 |

|  |  |  |  |
| --- | --- | --- | --- |
| Research | Benefiting GRDC Region  (can select up to three regions) | Benefiting GRDC Agro-Ecological Zone (see link: <http://www.grdc.com.au/About-Us/GRDC-Agroecological-Zones> ) for guidance about AE-Zone locations | |
| Experiment Title | Western Region  Choose an item.  Choose an item. | Qld Central  NSW NE/Qld SE  NSW Vic Slopes  Tas Grain  SA Midnorth-Lower Yorke Eyre  WA Northern  WA Eastern  WA Mallee | NSW Central  NSW NW/Qld SW  Vic High Rainfall  SA Vic Mallee  SA Vic Bordertown-Wimmera  WA Central  WA Sandplain |

**Results**

Results 2018

*Table 1: Soil characterisation of 0-10 cm from 2018 sites*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Soil Characterisation 0-10cm** | | | |
|  | **Soil Classification** | **Soil Texture** | **pH** | **Organic Carbon (%)** |
| **Corrigin Cereals** | Chromosol | Sand/Loam | 6.4 | 1.1 |
| **Corrigin Canola** | Chromosol | Sand | 6.2 | 1.7 |
| **Cunderdin Cereals** | Sodosol | Sand/Loam | 7.0 | 1.6 |
| **Cunderdin Canola** | Chromosol | Sand/Loam | 6.6 | 1.1 |
| **Kalannie** | Kandosol | Sand | 5.9 | 1.1 |
| **Merredin Cereals** | Kandosol | Sand | 5.5 | 1.1 |
| **Merredin Canola** | Kandosol | Sand/Loam | 5.9 | 0.7 |
| **Moorine Rock** | Tenosol | Loam | 7.1 | 0.8 |
| **Mukinbudin Cereals** | Calcarosol | Loam | 6.1 | 0.6 |
| **Mukinbudin Canola** | Chromosol | Loam | 5.1 | 0.7 |
| **Yealering** | Chromosol | Sand/Loam | 6.4 | 1.3 |
| **York** | Chromosol | Sand | 7.1 | 1.1 |

*Table 2: Significant wheat variety results for yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wheat** | **Significant variety response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y | Y | Y | Y | Y |
| **Cunderdin** |  | Y | Y | Y | Y |
| **Kalannie** | Y | Y | Y | Y |  |
| **Merredin** | Y | Y | Y | Y | Y |
| **Moorine Rock** | Y | Y |  |  |  |
| **Mukinbudin** | Y | Y | Y | Y | Y |
| **Yealering** | Y | Y |  | Y |  |
| **York** |  |  |  |  |  |

*Table 3: Significant wheat decile results for yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wheat** | **Significant decile response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y | Y | Y | Y | Y |
| **Cunderdin** |  | Y | Y | Y |  |
| **Kalannie** | Y | Y | Y |  |  |
| **Merredin** | Y |  | Y | Y | Y |
| **Moorine Rock** | Y | Y |  |  |  |
| **Mukinbudin** | Y | Y | Y |  |  |
| **Yealering** | Y | Y | Y | Y |  |
| **York** |  |  |  |  |  |

*Table 4: Significant barley variety results across yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Barley** | **Significant variety response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y |  |  | Y | Y |
| **Cunderdin** | - | - | - | - | - |
| **Kalannie** | Y | Y | Y | Y | Y |
| **Merredin** | Y |  |  | Y | Y |
| **Moorine Rock** | Y | Y | Y | Y |  |
| **Mukinbudin** |  | Y | Y |  | Y |
| **Yealering** | Y | Y |  |  | Y |
| **York** |  |  |  |  |  |

*Table 5: Significant barley decile results across yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Barley** | **Significant decile response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y |  | Y |  |  |
| **Cunderdin** | - | - | - | - | - |
| **Kalannie** | Y | Y | Y |  |  |
| **Merredin** | Y | Y | Y |  | Y |
| **Moorine Rock** | Y |  | Y |  | Y |
| **Mukinbudin** |  | Y |  |  |  |
| **Yealering** | Y | Y | Y |  | Y |
| **York** |  |  |  |  |  |

*Table 6: Significant canola variety results across yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Significant variety response** | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Oil** |
| **Corrigin** |  |  | Y | Y |
| **Cunderdin** |  |  | Y | Y |
| **Kalannie** | Y | Y |  | Y |
| **Merredin** |  | Y |  | Y |
| **Moorine Rock** |  | Y |  | Y |
| **Mukinbudin** |  |  | - | - |
| **Yealering** |  |  | Y |  |
| **York** |  |  |  |  |

*Table 7: Significant canola decile results across yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Significant variety response** | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Oil** |
| **Corrigin** |  |  | Y | Y |
| **Cunderdin** |  | Y | Y | Y |
| **Kalannie** | Y | Y | Y | Y |
| **Merredin** |  |  | Y |  |
| **Moorine Rock** | Y |  |  |  |
| **Mukinbudin** | Y |  | - | - |
| **Yealering** | Y | Y |  |  |
| **York** |  |  |  |  |

Please refer to Appendix 2 to look at the raw data and sites description

*Table 8: Yield results (t/ha) per site, crop type and decile for 2018 trials*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2018** | | | | | | | | |
| **Crop** | **Site** | **Total Rainfall in season (mm)** | **Achieved Decile for growing season** | **Target Yield (t/ha)** | **Achieved Yield (t/ha) Decile 0** | **Achieved Yield (t/ha) Decile 3** | **Achieved Yield (t/ha) Decile 6** | **Achieved Yield (t/ha) Play Season** |
| **wheat** | **Corrigin** | 351 | 3 | 4.0 | 2.60 | 3.04 | 3.24 | 3.63 |
| **barley** | 351 | 4.0 | 3.58 | 3.58 | 3.50 | 3.67 |
| **canola** | 427 | - | 2.73 | 3.01 | 3.21 | 3.20 |
| **wheat** | **Cunderdin** | 292 | 4 | 3.0 | 3.23 | 4.00 | 3.90 | 4.30 |
| **barley** | 292 | 3.0 | - | - | - | - |
| **canola** | 292 | - | 1.84 | 2.06 | 2.15 | 2.41 |
| **wheat** | **Kalannie** | 331 | 7 | 2.5 | 1.77 | 2.09 | 2.13 | 2.33 |
| **barley** | 331 | 2.5 | 1.70 | 1.97 | 2.02 | 2.05 |
| **canola** | 331 | - | 1.25 | 1.39 | 1.44 | 1.56 |
| **wheat** | **Merredin** | 314 | 5 | 3.0 | 1.33 | 1.50 | 1.49 | 1.40 |
| **barley** | 314 | 3.0 | 1.13 | 1.44 | 1.55 | 1.69 |
| **canola** | 314 | - | 1.25 | 1.48 | 1.64 | 1.93 |
| **wheat** | **Moorine Rock** | 358 | 6 | 1.5 | 0.94 | 0.94 | 0.84 | 0.83 |
| **barley** | 358 | 1.5 | 0.93 | 1.05 | 0.94 | 0.86 |
| **canola** | 358 | - | 0.19 | 0.22 | 0.17 | 0.16 |
| **wheat** | **Mukinbudin** | 249 | 3 | 1.0 | 0.90 | 1.10 | 1.30 | 1.10 |
| **barley** | 249 | 1.0 | 0.85 | 1.27 | 1.22 | 1.32 |
| **canola** | 301 | - | 0.07 | 0.08 | 0.08 | 0.09 |
| **wheat** | **Yealering** | 308 | 3 | 4.0 | 2.88 | 3.47 | 3.31 | 3.49 |
| **barley** | 308 | 4.0 | 3.16 | 3.84 | 3.68 | 3.78 |
| **canola** | 308 | - | 1.12 | 1.33 | 1.36 | 1.48 |
| **wheat** | **York** | 427 | 4 | 4.0 | 2.26 | 2.80 | 3.02 | 3.51 |
| **barley** | 427 | 4.0 | 2.45 | 3.02 | 3.43 | 3.63 |
| **canola** | 427 | - | 1.62 | 1.81 | 2.07 | 2.16 |

**Results 2019**

*Table 9: Soil characterisation of 0-10 cm from 2019 sites*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Soil Characterisation 0-10cm** | | | |
|  | **Soil Classification** | **Soil Texture** | **pH** | **Organic Carbon (%)** |
| **Corrigin** | Chromosol | Loam | 6.1 | 2.0 |
| **Cunderdin** | Chromosol | Sandy Loam | 6.7 | 1.3 |
| **Merredin** | Chromosol | Sand | 5.6 | 1.1 |
| **Moorine Rock** | Kandosol | Loamy Clay | 6.3 | 0.8 |
| **Mukinbudin** | Calcarosol | Loamy Clay | 5.4 | 0.6 |
| **Tincurrin** | Chromosol | Sandy Loam | 5.5 | 1.5 |
| **Wyalkatchem** | Calcarosol | Loamy Clay | 5.3 | 0.9 |
| **York** | Chromosol | Sandy Loam | 6.4 | 1.6 |

*Table 10: Significant wheat variety results for yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wheat** | **Significant variety response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y | Y |  | Y |  |
| **Cunderdin** | Y | Y | Y | Y |  |
| **Merredin** | Y | Y | Y | Y | Y |
| **Moorine Rock** |  | Y |  | Y | Y |
| **Mukinbudin** |  |  | Y | Y | Y |
| **Tincurrin** |  | Y | Y |  | Y |
| **Wyalkatchem** | Y | Y | Y |  | Y |
| **York** | Y | Y |  | Y | Y |

*Table 11: Significant wheat decile results for yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wheat** | **Significant decile response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y | Y | Y |  | Y |
| **Cunderdin** |  |  | Y |  |  |
| **Merredin** | Y | Y | Y |  | Y |
| **Moorine Rock** |  |  |  |  |  |
| **Mukinbudin** |  |  |  |  |  |
| **Tincurrin** |  |  |  |  |  |
| **Wyalkatchem** |  |  |  |  |  |
| **York** |  |  | Y | Y | Y |

*Table 12: Significant barley variety results across yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Barley** | **Significant variety response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y | Y | Y | Y |  |
| **Cunderdin** | Y | Y | Y | Y |  |
| **Merredin** | Y | Y | Y | Y | Y |
| **Moorine Rock** | Y | Y | Y | Y | Y |
| **Mukinbudin** |  | Y | Y | Y | Y |
| **Tincurrin** | Y |  | Y |  | Y |
| **Wyalkatchem** | Y | Y | Y | Y | Y |
| **York** | Y |  | Y | Y | Y |

*Table 13: Significant barley decile results across yardstick trials. Refer to Appendix 1 to look at the raw data and sites description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Barley** | **Significant decile response** | | | | |
|  | **NDVI** | **Yield t/ha** | **Protein (%)** | **Hectolitre Weight (kg/hL)** | **Screenings (%)** |
| **Corrigin** | Y | Y | Y | Y | Y |
| **Cunderdin** | Y |  |  |  |  |
| **Merredin** | Y | Y | Y | Y | Y |
| **Moorine Rock** |  |  |  |  |  |
| **Mukinbudin** |  |  |  |  |  |
| **Tincurrin** |  |  | Y |  |  |
| **Wyalkatchem** |  |  | Y |  |  |
| **York** |  |  |  |  |  |

*Table 14: Yield results (t/ha) per site, crop type and decile for 2019 trials*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2019** | | | | | | | |
| **Crop** | **Site** | **Total Rainfall in season (mm)** | **Achieved Decile for growing season** | **Target Yield (t/ha)** | **Achieved Yield (t/ha) Decile 1** | **Achieved Yield (t/ha) Decile 4** | **Achieved Yield (t/ha) Decile 7** |
| **wheat** | **Corrigin** | 279 | 5 | 4.0 | 1.80 | 2.18 | 2.22 |
| **barley** | 4.0 | 2.33 | 2.54 | 2.66 |
| **wheat** | **Cunderdin** | 205 | 2 | 3.0 | 2.12 | 2.19 | 2.04 |
| **barley** | 3.0 | 2.18 | 2.17 | 2.10 |
| **wheat** | **Merredin** | 222 | 3 | 3.0 | 1.12 | 1.22 | 1.24 |
| **barley** | 3.0 | 0.81 | 0.93 | 0.95 |
| **wheat** | **Moorine Rock** | 295 | 6 | 1.5 | 1.76 | 1.76 | 1.78 |
| **barley** | 1.5 | 1.88 | 1.85 | 1.80 |
| **wheat** | **Mukinbudin** | 179 | 2 | 1.0 | 0.56 | 0.57 | 0.56 |
| **barley** | 1.0 | 0.44 | 0.43 | 0.44 |
| **wheat** | **Tincurrin** | 308 | 3 | 3.5 | 2.18 | 2.15 | 2.09 |
| **barley** | 3.5 | 1.54 | 1.50 | 1.65 |
| **wheat** | **Wyalkatchem** | 262 | 1 | 2.5 | 1.19 | 1.15 | 1.22 |
| **barley** | 2.5 | 0.86 | 0.83 | 0.82 |
| **wheat** | **York** | 255 | 3 | 4.0 | 3.20 | 3.24 | 3.22 |
| **barley** | 4.0 | 3.41 | 3.42 | 3.16 |

*Table 15: Average economic analysis for all sites across different fertiliser treatments across 2018 and 2019. Gross margin per hectare $/ha is calculated as yield x $ per tonne minus the cost of the fertiliser treatment. Averages of all varieties were used. Note: detailed results per site available in Appendix 1.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2018** | | | **2019** | | |
| **Treatments** | **Yield t/ha** | **Gross Margin $/ha** | **Treatments** | **Yield t/ha** | **Gross Margin $/ha** |
| **Wheat** | | | | | |
| **Decile 0** | 1.9 | 668 | - |  |  |
| **Decile 3** | 2.3 | 751 | **Decile 1** | 1.6 | 540 |
| **Decile 6** | 2.4 | 754 | **Decile 4** | 1.7 | 524 |
| **PS** | 2.6 | 804 | **Decile 7** | 1.8 | 542 |
| **Barley** | | | | | |
| **Decile 0** | 1.9 | 605 | - |  |  |
| **Decile 3** | 2.3 | 685 | **Decile 1** | 1.3 | 336 |
| **Decile 6** | 2.3 | 675 | **Decile 4** | 1.4 | 321 |
| **PS** | 2.4 | 676 | **Decile 7** | 1.5 | 345 |
| **Canola** | | | | | |
| **Decile 0** | 1.4 | 828 | - |  |  |
| **Decile 3** | 1.6 | 912 | - |  |  |
| **Decile 6** | 1.7 | 952 | - |  |  |
| **PS** | 1.8 | 1006 | - |  |  |

Please see appendix 1 for individual location economic analysis.

**Conclusion**

In 2018, across all 8 sites, independent of crop type, variety choice was ultimately the driver of yield. Factorial analysis across all sites showed variety choice (Factor A) produced significantly different yield results. This is also reflected in the significance of the results for the other variables.

Similarly regardless of crop type, a nitrogen rate response was consistently observed.

In the higher rainfall areas, the nitrogen rates were too low to achieve yield potential, while in marginal areas where the trials were originally conceived, the nitrogen rates were more appropriate. This demonstrates the need for individual site-specific nitrogen rates rather than a blanket rate across the protocol for the whole project.

As expected, wheat was the most stable of yielders at all locations.

Canola emerged late (due to the late start of the season) and benefited from the October rain to achieve good yields. This might not have happened in a different season.

For that reason, in 2019, only included 4 wheat and 4 barley varieties increasing from 2 varieties in 2018. Different N rates were implemented, varying according to geographic location, soil type and target yield.

At 7 of the 8 wheat trial site locations and 6 of the 8 barley sites, variety choice was the main driver of yield.

Conversely, deciles, or nitrogen strategy, had limited influence on either wheat or barley yield, with significant yield increases only evident at Corrigin and Merredin wheat and barley. Nitrogen strategies did influence grain quality (protein) as expected, however only at 4 of the 8 sites for both cereals.

Higher deciles (decile 7) ensured the Corrigin and Merredin sites were better able to achieve their yield potential, however given the low rainfall season many of the sites were unable to reach yields close to their potential. In general, the WA wheatbelt experienced rainfall most like decile 1-3 therefore highlighting the conservative approach to a nitrogen strategy.

As expected, wheat was generally the most stable yielder across the sites in 2019, however the difference was not as great as observed in 2018.

Barley in both seasons suffered from a dry September when filling grain (as shown by the high screenings) resulting in most varieties across the trial sites only receiving a feed barley classification for 2018 trials.

**Appendix 1**

**Economic Analysis 2018**

ASSUMPTIONS:

* Potential classifications are based on classifications of each variety as at December 2018.
* Achieved classification is based on CBH grain quality standards as at December 2018.
* $ per tonne are calculated from CBH cash price Kwinana on 21 December 2018.
* Gross income $/ha is calculated as yield x $ per tonne minus the cost of the fertiliser. The cost of the fertiliser was calculated assuming a price of $435/t of urea; $300/t of UAN and $625/t TSP.

*Table 16: Fertiliser treatments considered in the economic analysis 2018 across locations.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Fertiliser cost** |
| **Decile 0** | 0 | 0 | 0 | 0 |
| **Decile 3** | 12 | 42 | 5 | 25 |
| **Decile 6** | 12 | 58 | 5 | 45 |
| **Play Season** | 30 | 20 | 5 | 73 |

## Location 1: Corrigin

Annual rainfall 2018 at Corrigin was 351mm resulting in a Decile 3 growing season. Target yield for this site was 4 t/ha

*Table 17: Economic Analysis Wheat Corrigin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 2.72 | ASW1 | 876 |
| Trojan | Decile 0 | 2.47 | ASW1 | 795 |
| Scepter | Decile 3 | 3.20 | ASW1 | 1006 |
| Trojan | Decile 3 | 2.88 | ANW2 | 903 |
| Scepter | Decile 6 | 3.47 | ASW1 | 1073 |
| Trojan | Decile 6 | 3.01 | ASW1 | 925 |
| Scepter | PS | 4.02 | AGP1 | 1222 |
| Trojan | PS | 3.24 | ANW2 | 1103 |

*Table 18: Economic Analysis Barley Corrigin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 3.74 | BFED1 | 1148 |
| Bass | Decile 0 | 3.43 | BFED1 | 1053 |
| La Trobe | Decile 3 | 3.57 | BFED1 | 1072 |
| Bass | Decile 3 | 3.58 | BFED1 | 1075 |
| La Trobe | Decile 6 | 3.42 | BFED1 | 1006 |
| Bass | Decile 6 | 3.58 | BFED1 | 1055 |
| La Trobe | PS | 3.74 | LT2 | 1075 |
| Bass | PS | 3.60 | Ba1 | 1058 |

*Table 19: Economic Analysis Canola Corrigin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 2.61 | CAN1 | 1514 |
| InVigor T4510 | Decile 0 | 2.85 | CAN1 | 1653 |
| Hyola 559 | Decile 3 | 3.09 | CAN1 | 1768 |
| InVigor T4510 | Decile 3 | 2.93 | CAN1 | 1675 |
| Hyola 559 | Decile 6 | 3.22 | CAN1 | 1823 |
| InVigor T4510 | Decile 6 | 3.19 | CAN1 | 1806 |
| Hyola 559 | PS | 3.41 | CAN1 | 1905 |
| InVigor T4510 | PS | 3.23 | CAN1 | 1801 |

## Location 2: Cunderdin

Annual rainfall 2018 at Cunderdin was 292mm resulting in a Decile 4 growing season. Target yield for this site was 3 t/ha.

*Table 20: Economic Analysis Wheat Cunderdin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 3.40 | FED1 | 1094 |
| Trojan | Decile 0 | 3.07 | FED1 | 988 |
| Scepter | Decile 3 | 4.01 | FED1 | 1268 |
| Trojan | Decile 3 | 3.60 | FED1 | 1135 |
| Scepter | Decile 6 | 3.90 | FED1 | 1212 |
| Trojan | Decile 6 | 3.90 | FED1 | 1211 |
| Scepter | PS | 4.67 | FED1 | 1430 |
| Trojan | PS | 3.94 | FED1 | 1196 |

Barley Cunderdin: Data analysis was not completed on the Yardstick barley trial. Soil type variation across the site resulted in variable growth, compromising the statistical validity of the trial.

*Table 21: Economic Analysis Canola Cunderdin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 1.84 | CAN1 | 1067 |
| InVigor T4510 | Decile 0 | 1.83 | CAN1 | 1061 |
| Hyola 559 | Decile 3 | 2.12 | CAN1 | 1205 |
| InVigor T4510 | Decile 3 | 2.01 | CAN1 | 1141 |
| Hyola 559 | Decile 6 | 2.18 | CAN1 | 1220 |
| InVigor T4510 | Decile 6 | 2.11 | CAN1 | 1180 |
| Hyola 559 | PS | 2.48 | CAN1 | 1366 |
| InVigor T4510 | PS | 2.33 | CAN1 | 1279 |

## Location 3: Kalannie

Annual rainfall 2018 at Kalannie was 331mm resulting in a Decile 7 growing season. Target yield for this site was 2.5 t/ha.

*Table 22: Economic Analysis Wheat Kalannie 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 2.34 | FED1 | 754 |
| Trojan | Decile 0 | 1.19 | APW1 | 470 |
| Scepter | Decile 3 | 2.66 | FED1 | 833 |
| Trojan | Decile 3 | 1.52 | APW1 | 577 |
| Scepter | Decile 6 | 2.86 | FED1 | 878 |
| Trojan | Decile 6 | 1.39 | APW1 | 504 |
| Scepter | PS | 3.08 | FED1 | 919 |
| Trojan | PS | 1.57 | APW1 | 547 |

*Table 23: Economic Analysis Barley Kalannie 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 1.88 | FED1 | 576.24 |
| Bass | Decile 0 | 1.51 | FED1 | 464.49 |
| La Trobe | Decile 3 | 2.30 | FED1 | 682.57 |
| Bass | Decile 3 | 1.64 | FED1 | 479.95 |
| La Trobe | Decile 6 | 2.33 | FED1 | 672.29 |
| Bass | Decile 6 | 1.71 | FED1 | 479.80 |
| La Trobe | PS | 2.25 | FED1 | 618.82 |
| Bass | PS | 1.84 | FED1 | 493.26 |

*Table 24: Economic Analysis Canola Kalannie 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 1.35 | CAN1 | 783 |
| InVigor T4510 | Decile 0 | 1.16 | CAN1 | 673 |
| Hyola 559 | Decile 3 | 1.43 | CAN1 | 805 |
| InVigor T4510 | Decile 3 | 1.34 | CAN1 | 753 |
| Hyola 559 | Decile 6 | 1.51 | CAN1 | 832 |
| InVigor T4510 | Decile 6 | 1.37 | CAN1 | 750 |
| Hyola 559 | PS | 1.62 | CAN1 | 867 |
| InVigor T4510 | PS | 1.5 | CAN1 | 798 |

## Location 4: Merredin

Annual rainfall 2018 at Merredin was 314mm resulting in a Decile 5 growing season. Target yield for this site was 3 t/ha.

*Table 25: Economic Analysis Wheat Merredin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 1.58 | FED1 | 509 |
| Trojan | Decile 0 | 1.08 | FED1 | 348 |
| Scepter | Decile 3 | 1.71 | FED1 | 526 |
| Trojan | Decile 3 | 1.29 | FED1 | 391 |
| Scepter | Decile 6 | 1.64 | FED1 | 484 |
| Trojan | Decile 6 | 1.34 | FED1 | 387 |
| Scepter | PS | 1.55 | FED1 | 426 |
| Trojan | PS | 1.25 | FED1 | 330 |

*Table 26: Economic Analysis Barley Merredin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 1.09 | FED1 | 335 |
| Bass | Decile 0 | 1.16 | FED1 | 356 |
| La Trobe | Decile 3 | 1.46 | FED1 | 424 |
| Bass | Decile 3 | 1.43 | FED1 | 415 |
| La Trobe | Decile 6 | 1.68 | FED1 | 472 |
| Bass | Decile 6 | 1.47 | FED1 | 407 |
| La Trobe | PS | 1.85 | FED1 | 495 |
| Bass | PS | 1.53 | FED1 | 397 |

*Table 27: Economic Analysis Canola Merredin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 1.18 | CAN1 | 684 |
| InVigor T4510 | Decile 0 | 1.33 | CAN1 | 771 |
| Hyola 559 | Decile 3 | 1.43 | CAN1 | 805 |
| InVigor T4510 | Decile 3 | 1.52 | CAN1 | 857 |
| Hyola 559 | Decile 6 | 1.54 | CAN1 | 849 |
| InVigor T4510 | Decile 6 | 1.74 | CAN1 | 965 |
| Hyola 559 | PS | 1.89 | CAN1 | 1023 |
| InVigor T4510 | PS | 1.98 | CAN1 | 1076 |

## Location 5: Moorine Rock

Annual rainfall 2018 at Moorine Rock was 358mm resulting in a Decile 6 growing season. Target yield for this site was 1.5 t/ha

*Table 28: Economic Analysis Wheat Moorine Rock 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 1.25 | H1 | 528 |
| Trojan | Decile 0 | 0.63 | FED1 | 204 |
| Scepter | Decile 3 | 1.37 | FED1 | 418 |
| Trojan | Decile 3 | 0.51 | APW1 | 178 |
| Scepter | Decile 6 | 1.20 | FED1 | 343 |
| Trojan | Decile 6 | 0.48 | APW1 | 145 |
| Scepter | PS | 1.29 | H1 | 472 |
| Trojan | PS | 0.36 | APW1 | 69 |

*Table 29: Economic Analysis Barley Moorine Rock 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 1.12 | FED1 | 344 |
| Bass | Decile 0 | 0.74 | FED1 | 227 |
| La Trobe | Decile 3 | 1.15 | FED1 | 329 |
| Bass | Decile 3 | 0.96 | FED1 | 270 |
| La Trobe | Decile 6 | 1.29 | FED1 | 352 |
| Bass | Decile 6 | 0.59 | FED1 | 137 |
| La Trobe | PS | 1.19 | FED1 | 292 |
| Bass | PS | 0.53 | FED1 | 90 |

*Table 30: Economic Analysis Canola Moorine Rock 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 0.16 | CAN2 | 93 |
| InVigor T4510 | Decile 0 | 0.22 | CAN2 | 128 |
| Hyola 559 | Decile 3 | 0.20 | CAN1 | 92 |
| InVigor T4510 | Decile 3 | 0.24 | CAN2 | 115 |
| Hyola 559 | Decile 6 | 0.14 | CAN1 | 37 |
| InVigor T4510 | Decile 6 | 0.20 | CAN1 | 72 |
| Hyola 559 | PS | 0.17 | CAN1 | 26 |
| InVigor T4510 | PS | 0.16 | CAN1 | 20 |

## Location 6: Mukinbudin

Annual rainfall 2018 at Mukinbudin was 249mm resulting in a Decile 3 growing season. Target yield for this site was 1 t/ha.

*Table 31: Economic Analysis Wheat Mukinbudin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 0.9 | FED1 | 290 |
| Trojan | Decile 0 | 0.9 | APW1 | 344 |
| Scepter | Decile 3 | 1.3 | FED1 | 384 |
| Trojan | Decile 3 | 0.9 | APW1 | 339 |
| Scepter | Decile 6 | 1.4 | FED1 | 390 |
| Trojan | Decile 6 | 1.2 | APW1 | 413 |
| Scepter | PS | 1.3 | H1 | 474 |
| Trojan | PS | 0.8 | APW1 | 246 |

*Table 32: Economic Analysis Barley Mukinbudin 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 1.07 | BFED1 | 328 |
| Bass | Decile 0 | 0.63 | BFED1 | 193 |
| La Trobe | Decile 3 | 1.54 | BFED1 | 448 |
| Bass | Decile 3 | 1.00 | BFED1 | 283 |
| La Trobe | Decile 6 | 1.45 | BFED1 | 401 |
| Bass | Decile 6 | 0.98 | BFED1 | 257 |
| La Trobe | PS | 1.55 | BFED1 | 403 |
| Bass | PS | 1.09 | BFED1 | 262 |

*No canola data provided due to extensive bird damage resulting in insufficient yield.*

## Location 7: Yealering

Annual rainfall 2018 at Yealering was 308mm resulting in a Decile 3 growing season. Target yield for this site was 4 t/ha.

*Table 33: Economic Analysis Wheat Yealering 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 3.17 | FED1 | 1021 |
| Trojan | Decile 0 | 2.58 | APW1 | 1019 |
| Scepter | Decile 3 | 3.70 | FED1 | 1167 |
| Trojan | Decile 3 | 3.23 | APW2 | 1148 |
| Scepter | Decile 6 | 3.80 | FED1 | 1179 |
| Trojan | Decile 6 | 2.81 | APW1 | 1066 |
| Scepter | PS | 3.91 | FED1 | 1186 |
| Trojan | PS | 3.06 | APW1 | 1136 |

*Table 34: Economic Analysis Barley Yealering 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 3.26 | LT2 | 1002 |
| Bass | Decile 0 | 3.06 | FED1 | 939 |
| La Trobe | Decile 3 | 4.14 | LT2 | 1246 |
| Bass | Decile 3 | 3.54 | FED1 | 1062 |
| La Trobe | Decile 6 | 3.93 | FED1 | 1163 |
| Bass | Decile 6 | 3.43 | FED1 | 1009 |
| La Trobe | PS | 4.04 | FED1 | 1167 |
| Bass | PS | 3.52 | FED1 | 1009 |

*Table 35: Economic Analysis Canola Yealering 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 1.16 | CAN1 | 673 |
| InVigor T4510 | Decile 0 | 1.08 | CAN1 | 626 |
| Hyola 559 | Decile 3 | 1.29 | CAN1 | 724 |
| InVigor T4510 | Decile 3 | 1.38 | CAN1 | 776 |
| Hyola 559 | Decile 6 | 1.36 | CAN1 | 745 |
| InVigor T4510 | Decile 6 | 1.36 | CAN1 | 745 |
| Hyola 559 | PS | 1.50 | CAN1 | 797 |
| InVigor T4510 | PS | 1.46 | CAN1 | 774 |

## Location 8: York

Annual rainfall 2018 at York was 427mm resulting in a Decile 4 growing season. Target yield for this site was 4 t/ha.

*Table 36: Economic Analysis Wheat York 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 0 | 2.45 | FED1 | 789 |
| Trojan | Decile 0 | 2.06 | FED1 | 663 |
| Scepter | Decile 3 | 3.13 | FED1 | 983 |
| Trojan | Decile 3 | 2.46 | FED1 | 768 |
| Scepter | Decile 6 | 3.54 | FED1 | 1096 |
| Trojan | Decile 6 | 2.50 | FED1 | 761 |
| Scepter | PS | 3.76 | FED1 | 1138 |
| Trojan | PS | 3.26 | FED1 | 977 |

*Table 37: Economic Analysis Barley York 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| La Trobe | Decile 0 | 2.55 | FED1 | 783 |
| Bass | Decile 0 | 2.36 | FED1 | 725 |
| La Trobe | Decile 3 | 3.13 | FED1 | 936 |
| Bass | Decile 3 | 2.91 | FED1 | 869 |
| La Trobe | Decile 6 | 3.26 | FED1 | 957 |
| Bass | Decile 6 | 3.60 | MALT1 | 1086 |
| La Trobe | PS | 3.83 | FED1 | 1103 |
| Bass | PS | 3.43 | MALT1 | 1004 |

*Table 38: Economic Analysis Canola York 2018*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Canola** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Hyola 559 | Decile 0 | 1.78 | CAN1 | 1032 |
| InVigor T4510 | Decile 0 | 1.45 | CAN1 | 841 |
| Hyola 559 | Decile 3 | 1.89 | CAN1 | 1072 |
| InVigor T4510 | Decile 3 | 1.74 | CAN1 | 985 |
| Hyola 559 | Decile 6 | 2.03 | CAN1 | 1133 |
| InVigor T4510 | Decile 6 | 2.10 | CAN1 | 1174 |
| Hyola 559 | PS | 2.25 | CAN1 | 1232 |
| InVigor T4510 | PS | 2.07 | CAN1 | 1123 |

**Economic Analysis 2019**

        ASSUMPTIONS:

* Potential classifications are based on classifications of each variety as at December 2018.
* Achieved classification is based on CBH grain quality standards as at December 2018.
* $ per tonne are calculated from CBH cash price Kwinana on 21 December 2018.
* Gross income $/ha is calculated as yield x $ per tonne minus the cost of the fertiliser. The cost of the fertiliser was calculated assuming a price of 400 $/Tn of UAN and 735 $/Tn of Gusto Gold.

**Location 1: Corrigin**

Annual rainfall 2019 at Corrigin was 279mm resulting in a Decile 5 growing season. Target yield for this site was 4 t/ha.

*Table 39: Fertiliser treatments for Corrigin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 12 | 0 | 15 | 88 |
| **Decile 4** | 12 | 42 | 15 | 128 |
| **Decile 7** | 12 | 58 | 15 | 143 |

*Table 40: Economic Analysis Wheat Corrigin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 1.92 | ASW1 | 593 |
| Trojan | Decile 1 | 1.65 | ASW1 | 498 |
| Devil | Decile 1 | 1.93 | ASW1 | 597 |
| Ninja | Decile 1 | 1.68 | ANW2 | 491 |
| Scepter | Decile 4 | 2.14 | ASW1 | 631 |
| Trojan | Decile 4 | 2.16 | ASW1 | 639 |
| Devil | Decile 4 | 2.34 | AGP1 | 670 |
| Ninja | Decile 4 | 2.07 | ANW2 | 586 |
| Scepter | Decile 7 | 2.25 | ASW1 | 656 |
| Trojan | Decile 7 | 2.13 | ASW1 | 613 |
| Devil | Decile 7 | 2.35 | AGP1 | 658 |
| Ninja | Decile 7 | 2.17 | ANW2 | 606 |

*Table 41: Economic Analysis Barley Corrigin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 2.72 | FED1 | 747 |
| Buff | Decile 1 | 2.19 | FED1 | 584 |
| Spartacus | Decile 1 | 2.40 | FED1 | 649 |
| Planet | Decile 1 | 2.01 | FED1 | 529 |
| Rosalind | Decile 4 | 2.91 | FED1 | 765 |
| Buff | Decile 4 | 2.35 | FED1 | 593 |
| Spartacus | Decile 4 | 2.73 | FED1 | 710 |
| Planet | Decile 4 | 2.19 | FED1 | 544 |
| Rosalind | Decile 7 | 2.93 | FED1 | 757 |
| Buff | Decile 7 | 2.49 | FED1 | 621 |
| Spartacus | Decile 7 | 2.86 | FED1 | 735 |
| Planet | Decile 7 | 2.35 | FED1 | 578 |

## Location 2: Cunderdin

Annual rainfall 2019 at Cunderdin was 205mm resulting in a Decile 2 growing season. Target yield for this site was 3 t/ha.

*Table 42: Fertiliser treatments for Cunderdin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 4** | 52 | 50 | 13 | 120 |
| **Decile 7** | 52 | 54 | 13 | 128 |
| **Decile 9** | 52 | 67 | 13 | 137 |

Due to an in-season error, the entire yardstick trial received 100 L/ha of UAN. This adjusted the deciles used at the site. The Cunderdin site now evaluated Decile 4, 7 and 9, rather than the initial 1, 4 and 7 used across the remaining sites.

*Table 43: Economic Analysis Wheat Cunderdin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 4 | 2.15 | APW1 | 552 |
| Trojan | Decile 4 | 1.87 | APW1 | 441 |
| Devil | Decile 4 | 2.25 | ASW1 | 501 |
| Ninja | Decile 4 | 2.19 | ANW1 | 460 |
| Scepter | Decile 7 | 2.20 | APW2 | 674 |
| Trojan | Decile 7 | 2.03 | APW1 | 677 |
| Devil | Decile 7 | 2.23 | APW1 | 756 |
| Ninja | Decile 7 | 2.29 | ANW1 | 668 |
| Scepter | Decile 9 | 2.23 | H2 | 802 |
| Trojan | Decile 9 | 1.91 | APW1 | 617 |
| Devil | Decile 9 | 2.22 | APW1 | 740 |
| Ninja | Decile 9 | 1.79 | ANW2 | 480 |

*Table 44: Economic Analysis Barley Cunderdin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 4 | 2.40 | FED1 | 439 |
| Buff | Decile 4 | 2.20 | FED1 | 378 |
| Spartacus | Decile 4 | 2.20 | MALT2 | 389 |
| Planet | Decile 4 | 1.80 | MALT2 | 255 |
| Rosalind | Decile 7 | 2.50 | FED1 | 643 |
| Buff | Decile 7 | 2.20 | FED1 | 551 |
| Spartacus | Decile 7 | 2.30 | FED1 | 581 |
| Planet | Decile 7 | 1.70 | FED1 | 397 |
| Rosalind | Decile 9 | 2.30 | FED1 | 569 |
| Buff | Decile 9 | 2.30 | FED1 | 569 |
| Spartacus | Decile 9 | 2.20 | FED1 | 538 |
| Planet | Decile 9 | 1.60 | FED1 | 354 |

## Location 3: Merredin

Annual rainfall 2019 at Merredin was 222mm resulting in a Decile 3 growing season. Target yield for this site was 3 t/ha.

*Table 45: Fertilizer treatments for Merredin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 8 | 0 | 10 | 58 |
| **Decile 4** | 8 | 42 | 10 | 98 |
| **Decile 7** | 8 | 57 | 10 | 112 |

*Table 46: Economic Analysis Wheat Merredin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 1.37 | ASW1 | 428 |
| Trojan | Decile 1 | 0.85 | AGP1 | 231 |
| Devil | Decile 1 | 1.17 | ASW1 | 357 |
| Ninja | Decile 1 | 1.10 | ANW2 | 321 |
| Scepter | Decile 4 | 1.27 | AGP1 | 334 |
| Trojan | Decile 4 | 1.02 | AGP1 | 249 |
| Devil | Decile 4 | 1.34 | AGP1 | 358 |
| Ninja | Decile 4 | 1.27 | ANW2 | 339 |
| Scepter | Decile 7 | 1.35 | AGP1 | 348 |
| Trojan | Decile 7 | 0.98 | AUH2 | 264 |
| Devil | Decile 7 | 1.35 | AGP1 | 348 |
| Ninja | Decile 7 | 1.30 | ANW1 | 337 |

*Table 47: Economic Analysis Barley Merredin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 1.03 | FED1 | 257 |
| Buff | Decile 1 | 0.93 | FED1 | 227 |
| Spartacus | Decile 1 | 0.67 | FED1 | 147 |
| Planet | Decile 1 | 0.61 | FED1 | 128 |
| Rosalind | Decile 4 | 0.97 | FED1 | 199 |
| Buff | Decile 4 | 1.28 | FED1 | 294 |
| Spartacus | Decile 4 | 0.81 | FED1 | 150 |
| Planet | Decile 4 | 0.65 | FED1 | 101 |
| Rosalind | Decile 7 | 0.99 | FED1 | 191 |
| Buff | Decile 7 | 1.21 | FED1 | 259 |
| Spartacus | Decile 7 | 0.89 | FED1 | 160 |
| Planet | Decile 7 | 0.69 | FED1 | 99 |

## Location 4: Moorine Rock

Annual rainfall 2019 at Moorine Rock was 295mm resulting in a Decile 6 growing season. Target yield for this site was 1.5 t/ha.

*Table 48: Fertiliser treatments for Moorine Rock 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 8 | 0 | 10 | 59 |
| **Decile 4** | 8 | 22 | 10 | 80 |
| **Decile 7** | 8 | 32 | 10 | 90 |

*Table 49: Economic Analysis Wheat Moorine Rock 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 1.77 | H2 | 686 |
| Trojan | Decile 1 | 1.64 | APW1 | 589 |
| Devil | Decile 1 | 1.91 | H2 | 745 |
| Ninja | Decile 1 | 1.71 | ANW2 | 531 |
| Scepter | Decile 4 | 1.82 | H2 | 687 |
| Trojan | Decile 4 | 1.56 | APW1 | 537 |
| Devil | Decile 4 | 1.92 | H2 | 729 |
| Ninja | Decile 4 | 1.76 | ANW2 | 528 |
| Scepter | Decile 7 | 1.78 | H2 | 660 |
| Trojan | Decile 7 | 1.66 | APW1 | 567 |
| Devil | Decile 7 | 1.95 | H2 | 732 |
| Ninja | Decile 7 | 1.71 | ANW2 | 501 |

*Table 50: Economic Analysis Barley Moorine Rock 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 2.05 | FED1 | 571 |
| Buff | Decile 1 | 1.96 | FED1 | 543 |
| Spartacus | Decile 1 | 2.06 | FED1 | 574 |
| Planet | Decile 1 | 1.45 | FED1 | 386 |
| Rosalind | Decile 4 | 1.96 | FED1 | 522 |
| Buff | Decile 4 | 1.88 | FED1 | 498 |
| Spartacus | Decile 4 | 2.24 | FED1 | 608 |
| Planet | Decile 4 | 1.32 | FED1 | 326 |
| Rosalind | Decile 7 | 1.91 | FED1 | 497 |
| Buff | Decile 7 | 1.82 | FED1 | 470 |
| Spartacus | Decile 7 | 2.09 | FED1 | 552 |
| Planet | Decile 7 | 1.38 | FED1 | 334 |

## Location 5: Mukinbudin

Annual rainfall 2019 at Mukinbudin was 179mm resulting in a Decile 2 growing season. Target yield for this site was 1 t/ha.

*Table 51: Fertiliser treatments for Mukinbudin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 8 | 0 | 10 | 59 |
| **Decile 4** | 8 | 22 | 10 | 80 |
| **Decile 7** | 8 | 32 | 10 | 90 |

*Table 52: Economic Analysis Wheat Mukinbudin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 0.61 | AUH2 | 175 |
| Trojan | Decile 1 | 0.50 | AUH2 | 133 |
| Devil | Decile 1 | 0.57 | AGP1 | 136 |
| Ninja | Decile 1 | 0.56 | ANW1 | 135 |
| Scepter | Decile 4 | 0.57 | AGP1 | 115 |
| Trojan | Decile 4 | 0.63 | AUH2 | 162 |
| Devil | Decile 4 | 0.52 | AGP1 | 98 |
| Ninja | Decile 4 | 0.55 | ANW1 | 111 |
| Scepter | Decile 7 | 0.55 | AUH2 | 122 |
| Trojan | Decile 7 | 0.55 | AUH2 | 122 |
| Devil | Decile 7 | 0.58 | AUH2 | 134 |
| Ninja | Decile 7 | 0.53 | ANW2 | 94 |

*Table 53: Economic Analysis Barley Mukinbudin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 0.53 | FED1 | 104 |
| Buff | Decile 1 | 0.40 | FED1 | 64 |
| Spartacus | Decile 1 | 0.56 | FED1 | 113 |
| Planet | Decile 1 | 0.29 | FED1 | 30 |
| Rosalind | Decile 4 | 0.50 | FED1 | 74 |
| Buff | Decile 4 | 0.38 | FED1 | 37 |
| Spartacus | Decile 4 | 0.55 | FED1 | 89 |
| Planet | Decile 4 | 0.31 | FED1 | 16 |
| Rosalind | Decile 7 | 0.51 | FED1 | 67 |
| Buff | Decile 7 | 0.36 | FED1 | 21 |
| Spartacus | Decile 7 | 0.57 | FED1 | 86 |
| Planet | Decile 7 | 0.31 | FED1 | 6 |

## Location 6: Tincurrin

Annual rainfall 2019 at Tincurrin was 308mm resulting in a Decile 3 growing season. Target yield for this site was 3.5 t/ha.

*Table 54: Fertiliser treatments for Tincurrin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 10 | 0 | 13 | 73 |
| **Decile 4** | 10 | 42 | 13 | 113 |
| **Decile 7** | 10 | 58 | 13 | 128 |

*Table 55: Economic Analysis Wheat Tincurrin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 2.35 | H2 | 916 |
| Trojan | Decile 1 | 1.81 | AUH2 | 622 |
| Devil | Decile 1 | 2.54 | APWN | 899 |
| Ninja | Decile 1 | 2.01 | ANW2 | 620 |
| Scepter | Decile 4 | 2.41 | H2 | 901 |
| Trojan | Decile 4 | 1.70 | AUH2 | 539 |
| Devil | Decile 4 | 2.22 | H2 | 821 |
| Ninja | Decile 4 | 2.26 | ANW2 | 666 |
| Scepter | Decile 7 | 2.06 | H2 | 739 |
| Trojan | Decile 7 | 1.84 | AUH2 | 578 |
| Devil | Decile 7 | 2.34 | H2 | 857 |
| Ninja | Decile 7 | 2.12 | ANW2 | 603 |

*Table 56: Economic Analysis Barley Tincurrin 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 1.57 | FED1 | 408 |
| Buff | Decile 1 | 1.66 | FED1 | 436 |
| Spartacus | Decile 1 | 1.49 | FED1 | 384 |
| Planet | Decile 1 | 1.44 | FED1 | 369 |
| Rosalind | Decile 4 | 1.73 | FED1 | 418 |
| Buff | Decile 4 | 1.39 | FED1 | 313 |
| Spartacus | Decile 4 | 1.71 | FED1 | 411 |
| Planet | Decile 4 | 1.18 | FED1 | 249 |
| Rosalind | Decile 7 | 1.70 | FED1 | 394 |
| Buff | Decile 7 | 1.83 | FED1 | 434 |
| Spartacus | Decile 7 | 1.63 | FED1 | 372 |
| Planet | Decile 7 | 1.44 | FED1 | 314 |

## Location 7: Wyalkatchem

Annual rainfall 2019 at Wyalkatchem was 262mm resulting in a Decile 1 growing season. Target yield for this site was 2.5 t/ha.

*Table 57: Fertiliser treatments for Wyalkatchem 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 8 | 0 | 0 | 59 |
| **Decile 4** | 8 | 42 | 5 | 99 |
| **Decile 7** | 8 | 57 | 5 | 112 |

*Table 58: Economic Analysis Wheat Wyalkatchem 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 1.27 | APW1 | 443 |
| Trojan | Decile 1 | 1.14 | APW1 | 392 |
| Devil | Decile 1 | 1.23 | APWN | 412 |
| Ninja | Decile 1 | 1.12 | ANW1 | 329 |
| Scepter | Decile 4 | 1.24 | H2 | 423 |
| Trojan | Decile 4 | 1.00 | AUH2 | 285 |
| Devil | Decile 4 | 1.17 | H2 | 394 |
| Ninja | Decile 4 | 1.17 | ANW1 | 306 |
| Scepter | Decile 7 | 1.31 | H2 | 439 |
| Trojan | Decile 7 | 1.15 | APW1 | 341 |
| Devil | Decile 7 | 1.22 | H2 | 401 |
| Ninja | Decile 7 | 1.21 | ANW2 | 305 |

*Table 59: Economic Analysis Barley Wyalkatchem 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 0.94 | FED1 | 230 |
| Buff | Decile 1 | 0.94 | FED1 | 230 |
| Spartacus | Decile 1 | 0.94 | FED1 | 230 |
| Planet | Decile 1 | 0.60 | FED1 | 125 |
| Rosalind | Decile 4 | 1.00 | FED1 | 208 |
| Buff | Decile 4 | 0.81 | FED1 | 150 |
| Spartacus | Decile 4 | 1.00 | FED1 | 208 |
| Planet | Decile 4 | 0.52 | FED1 | 61 |
| Rosalind | Decile 7 | 0.89 | FED1 | 160 |
| Buff | Decile 7 | 0.92 | FED1 | 170 |
| Spartacus | Decile 7 | 0.93 | FED1 | 173 |
| Planet | Decile 7 | 0.52 | FED1 | 47 |

## Location 8: York

Annual rainfall 2019 at York was 255mm resulting in a Decile 3 growing season. Target yield for this site was 4 t/ha.

*Table 60: Fertiliser treatments for York 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** | **Cost ($/ha)** |
| **Decile 1** | 12 | 0 | 15 | 88 |
| **Decile 4** | 12 | 42 | 15 | 128 |
| **Decile 7** | 12 | 63 | 15 | 147 |

*Table 61: Economic Analysis Wheat York 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Wheat** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Scepter | Decile 1 | 3.20 | AGP1 | 1003 |
| Trojan | Decile 1 | 2.93 | AGP1 | 911 |
| Devil | Decile 1 | 3.20 | AGP1 | 1003 |
| Ninja | Decile 1 | 2.99 | ANW2 | 943 |
| Scepter | Decile 4 | 3.24 | AGP1 | 977 |
| Trojan | Decile 4 | 2.92 | AGP1 | 868 |
| Devil | Decile 4 | 3.15 | AUN1 | 902 |
| Ninja | Decile 4 | 3.19 | ANW2 | 972 |
| Scepter | Decile 7 | 3.22 | AGP1 | 950 |
| Trojan | Decile 7 | 2.79 | AGP1 | 804 |
| Devil | Decile 7 | 3.20 | AGP1 | 943 |
| Ninja | Decile 7 | 3.14 | AUN1 | 879 |

*Table 62: Economic Analysis Barley York 2019*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Barley** | **Treatments** | **Yield (t/ha)** | **Grade achieved** | **Gross Margin ($/ha)** |
| Rosalind | Decile 1 | 3.29 | FED1 | 922 |
| Buff | Decile 1 | 3.23 | FED1 | 903 |
| Spartacus | Decile 1 | 3.76 | FED1 | 1066 |
| Planet | Decile 1 | 3.34 | FED1 | 937 |
| Rosalind | Decile 4 | 3.39 | FED1 | 913 |
| Buff | Decile 4 | 3.51 | FED1 | 949 |
| Spartacus | Decile 4 | 3.13 | FED1 | 833 |
| Planet | Decile 4 | 3.64 | FED1 | 989 |
| Rosalind | Decile 7 | 2.85 | FED1 | 727 |
| Buff | Decile 7 | 3.06 | FED1 | 792 |
| Spartacus | Decile 7 | 3.38 | FED1 | 890 |
| Planet | Decile 7 | 3.33 | FED1 | 875 |

**Appendix 2**

**Appendix 2 A Data 2018**

## Location 1: Corrigin

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Corrigin NVT | **Sowing Date:** | 21/05/2018 |
| **Varieties:** | |  | | --- | | Scepter,& Trojan | | **Harvest Date:** | 04/12/2018 |
| **Previous Crop:** | Canola |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Corrigin NVT | **Sowing Date:** | 21/05/2018 |
| **Varieties:** | |  | | --- | | LaTrobe & Bass | | **Harvest Date:** | 04/12/2018 |
| **Previous Crop:** | Canola |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Frost Site Dale | **Sowing Date:** | | 27/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 27/11/2018 |
| **Previous Crop:** | Oaten hay |  | |  |
|  |  |  | |  |
| |  | | --- | | ***Weather Conditions*** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event (Cereals)*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -0.8  °C on Aug 10, -0.5 °C on Aug 11, -0.7 °C on Aug 12, -0.9 °C on Aug 13, -0.1 °C on Aug 17, -2.1  °C on Aug 18, -0.1 °C on Aug 19, -0.2 °C on Aug 25, -1.2 °C on Sep 6, -0.3 °C on Sep 11, -0.8 °C  on Sep 14, -4.1 °C on Sep 15, -3.4 °C on Sep 16, -0.6 °C on Sep 20. Interpret results with  caution. | | ***Heat Event*** | Heat Event This trial experienced extreme heat conditions on the following dates throughout the flowering  period: 33.4 °C on Sep 3, 33 °C on Sep 22, 33.2 °C on Sep 23, 33.1 °C on Sep 25, 32.3 °C on  Sep 30, 32.2 °C on Oct 9, 32.7 °C on Oct 11, 34.8 °C on Oct 17, 33.5 °C on Oct 25, 36.2 °C on  Oct 28, 37.3 °C on Oct 29. Interpret results with caution. | | | | | | | |

**Note: No weather data was recorded for the canola due to a faulty tiny tag.**

***Cereals rainfall (mm) Data Source: DPIRD Weather Station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 48.2 | 43.2 | 4.2 | 16.6 | 15.4 | 38.6 | 66.2 | 57.6 | 4 | 31.4 | 25.8 | 0 |

***Canola rainfall (mm) Data Source: DPIRD Weather Station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 91.8 | 27.2 | 0.2 | 11.4 | 0.4 | 51.2 | 111.8 | 86.4 | 7 | 38 | 1 | 0.4 |

***Soil Testing***

1. ***Cereals***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Chromosols  Chromosols: soils with a strong texture contrast between the topsoil and subsoil. Subsoils  are not strongly acid and are not sodic |
| ***Sub-Order*** | Brown |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***15/03/2018*** | 0-10 | 1.5 | 10 | 29 | Colwell |
|  | ***15/03/2018*** | 10-60 | 1.5 | 10 | 16 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***15/03/2018*** | 1.1 | 6.4 | 5.3 | 0.??? | Na |
|  | ***15/03/2018*** | 0.9 | 5.9 | 5.0 | 0.??? | 1.1 |

1. ***Canola***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Chromosols  Chromosols: soils with a strong texture contrast between the topsoil and subsoil. Subsoils  are not strongly acid and are not sodic |
| ***Sub-Order*** | Dark Brown |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***15/03/2018*** | 0-10 | 1 | 52 | 46 | Colwell |
|  | ***15/03/2018*** | 10-60 | 1 | 24 | 22 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***15/03/2018*** | 1.7 | 6.2 | 5.6 | 0 | na |
|  | ***15/03/2018*** | 1.3 | 5.8 | 5.2 | 0 | na |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 20/07/2018
* Canola applied 13/07/2018

***Results***

1. ***WHEAT***

Table 63: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 130 | 135 | 129 | 125 | *130* |
| **Trojan** | 123 | 126 | 134 | 111 | *124* |
| ***Means*** | *127* | *131* | *132* | *118* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a | |

Table 64: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.7 | 9.0 | 9.0 | 9.0 | *9.0* |
| **Trojan** | 9.0 | 9.0 | 9.0 | 8.7 | *9.0* |
| ***Means*** | *8.8* | *9.0* | *9.0* | *8.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a | |

Table 65: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 8.7 | 8.3 | *9.0* |
| **Trojan** | 7.3 | 8.0 | 8.3 | 8.3 | *8.0* |
| ***Means*** | *8.2* | *8.5* | *8.5* | *8.3* |  |
|  | Significance (Variety) P= 0.009 | | | l.s.d (P<0.05) = 0.5 | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a | |

Table 66: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a | |

Table 67: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.40 | 0.48 | 0.51 | 0.61 | *0.50* |
| **Trojan** | 0.35 | 0.40 | 0.46 | 0.52 | *0.43* |
| ***Means*** | *0.38* | *0.44* | *0.48* | *0.56* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = 0.028 | |
|  | Significance (Decile) P= 0.04 | | | l.s.d (P<0.05) = 0.04 | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a | |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 267 | 266 | 265 | 265 | *266* |
| **Trojan** | 272 | 271 | 270 | 270 | *271* |
| ***Means*** | *270* | *269* | *267* | *267* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 1.2 |
|  | Significance (Decile) P= 0.032 | | | l.s.d (P<0.05) = | 1.5 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **Scepter** | 14.2 | 7.3 | 8.3 | 8.0 |
| **Trojan** | 7.6 | 11.1 | 11.1 | 9.5 |

Note: No statistical analysis can be completed as only one replicate was assessed.

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 2.72 | 3.20 | 3.47 | 4.02 | *3.35* |
| **Trojan** | 2.47 | 2.88 | 3.01 | 3.24 | *2.90* |
| ***Means*** | *2.60* | *3.04* | *3.24* | *3.63* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.14 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.2 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 7.2 | 7.1 | 7.8 | 8.8 | *8.0* |
| **Trojan** | 8.0 | 8.3 | 8.6 | 10.1 | *9.0* |
| ***Means*** | *7.6* | *7.7* | *8.2* | *9.5* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.37 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.52 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Hectolitre Weight (kg/hL) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 82.0 | 81.9 | 82.8 | 83.6 | *82.6* |
| **Trojan** | 84.6 | 84.8 | 85.3 | 85.0 | *84.9* |
| ***Means*** | *83.3* | *83.3* | *84.0* | *84.3* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.39 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.55 |
|  | Significance (Variety\*Decile) P= 0.047 | | | l.s.d (P<0.05) = | 0.79 |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1.3 | 1.0 | 1.0 | 0.9 | *1.0* |
| **Trojan** | 0.8 | 0.6 | 0.6 | 0.4 | *0.6* |
| ***Means*** | *1.1* | *0.8* | *0.8* | *0.7* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.18 |
|  | Significance (Decile) P= 0.037 | | | l.s.d (P<0.05) = | 0.25 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

1. BARLEY

Table 68: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 122 | 122 | 129 | 127 | *125* |
| **Bass** | 121 | 115 | 113 | 121 | *118* |
| ***Means*** | *122* | *119* | *121* | *124* |  |
|  | Significance (Variety) P=0.005 | | | l.s.d (P<0.05) = | 4.6 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 69: Crop emergence (0-9) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 8.0 | 8.3 | 9.2 | 8.7 | *8.5* |
| **Bass** | 8.7 | 9.0 | 8.3 | 8.7 | *8.7* |
| ***Means*** | *8.3* | *8.7* | *8.7* | *8.7* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 70: Crop vigour (0-9) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 8.0 | 8.7 | 9.0 | 9.0 | *8.7* |
| **Bass** | 8.3 | 9.0 | 8.7 | 9.0 | *8.8* |
| ***Means*** | *8.2* | *8.8* | *8.8* | *9.0* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=0.005 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 71: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 2 | 2 | 2 | 2 | *2* |
| **Bass** | 3 | 4 | 3 | 3 | *3* |
| ***Means*** | *2* | *3* | *3* | *3* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 72: NDVI reading barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 0.39 | 0.49 | 0.58 | 0.57 | *0.51* |
| **Bass** | 0.55 | 0.60 | 0.63 | 0.70 | *0.62* |
| ***Means*** | *0.47* | *0.55* | *0.60* | *0.64* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.033 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.047 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 256 | 254 | 254 | 253 | *254* |
| **Bass** | 258 | 258 | 258 | 258 | *258* |
| ***Means*** | *257* | *256* | *256* | *256* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 1.1 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 3.74 | 3.57 | 3.42 | 3.74 | *3.62* |
| **Bass** | 3.43 | 3.58 | 3.58 | 3.60 | *3.55* |
| ***Means*** | *3.58* | *3.58* | *3.50* | *3.67* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 7.6 | 7.6 | 8.5 | 9.0 | 8.2 |
| **Bass** | 8.0 | 8.2 | 8.9 | 9.6 | 8.7 |
| ***Means*** | 7.8 | 7.9 | 8.7 | 9.3 |  |
|  | Significance (Variety) P=0.006 | | | l.s.d (P<0.05) = | 0.35 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.49 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Colour (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 64.1 | 64.5 | 63.7 | 63.4 | *63.9* |
| **Bass** | 65.3 | 64.8 | 64.3 | 64.2 | *64.7* |
| ***Means*** | *64.7* | *64.6* | *64.0* | *63.8* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.34 |
|  | Significance (Decile) P=0.003 | | | l.s.d (P<0.05) = | 0.49 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 71.3 | 71.4 | 71.7 | 71.3 | *71.5* |
| **Bass** | 70.3 | 70.7 | 70.7 | 71.1 | *70.7* |
| ***Means*** | *70.8* | *71.1* | *71.2* | *71.2* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.296 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 12: <2.2 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 1.9 | 2.0 | 2.3 | 2.2 | *2.1* |
| **Bass** | 0.8 | 0.9 | 0.7 | 0.7 | *0.8* |
| ***Means*** | *1.3* | *1.5* | *1.5* | *1.4* |  |
|  | Significance (Variety) P= | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= | | | l.s.d (P<0.05) = | n.a |

Table 13: 2.2-2.5 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 6.8 | 9.5 | 10.6 | 12.7 | *9.9* |
| **Bass** | 2.9 | 3.2 | 2.6 | 4.6 | *3.3* |
| ***Means*** | *4.8* | *6.3* | *6.6* | *8.7* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 2.93 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 91.4 | 88.5 | 87.1 | 85.1 | *88.0* |
| **Bass** | 96.3 | 95.9 | 96.7 | 94.7 | *95.9* |
| ***Means*** | *93.9* | *92.2* | *91.9* | *89.9* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 3.244 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

***3- CANOLA***

Table 73: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 47 | 50 | 43 | 47 | *47* |
| **InVigor T4510** | 51 | 45 | 44 | 44 | *46* |
| ***Means*** | *49* | *48* | *44* | *45* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 74: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 9.0 | 9.0 | 8.0 | 8.7 | *8.7* |
| **InVigor T4510** | 9.0 | 8.3 | 8.3 | 7.3 | *8.3* |
| ***Means*** | *9.0* | *8.7* | *8.2* | *8.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 75: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.3 | 8.7 | 8.7 | 9.0 | *8.0* |
| **InVigor T4510** | 7.0 | 7.7 | 8.7 | 9.0 | *8.0* |
| ***Means*** | *7.2* | *8.2* | *8.7* | *9.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 4: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.55 | 0.60 | 0.62 | 0.70 | *0.62* |
| **InVigor T4510** | 0.58 | 0.59 | 0.57 | 0.65 | *0.60* |
| ***Means*** | *0.56* | *0.60* | *0.60* | *0.68* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.001 | | | l.s.d (P<0.05) = | 0.047 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 5: Days to 50% flowering canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 236 | 230 | 232 | 232 | *232* |
| **InVigor T4510** | 236 | 232 | 230 | 231 | *232* |
| ***Means*** | *236* | *231* | *231* | *231* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 1.9 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 2.61 | 3.09 | 3.22 | 3.41 | *3.08* |
| **InVigor T4510** | 2.85 | 2.93 | 3.19 | 3.23 | *3.05* |
| ***Means*** | *2.73* | *3.01* | *3.21* | *3.20* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.206 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Protein (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 19.6 | 19.3 | 19.7 | 19.4 | *19.5* |
| **InVigor T4510** | 19.0 | 18.5 | 19.3 | 19.4 | *19.1* |
| ***Means*** | *19.3* | *18.9* | *19.5* | *19.4* |  |
|  | Significance (Variety) P= 0.003 | | | l.s.d (P<0.05) = | 0.28 |
|  | Significance (Decile) P= 0.039 | | | l.s.d (P<0.05) = | 0.39 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Oil canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 49.30 | 49.73 | 49.37 | 49.40 | *49.45* |
| **InVigor T4510** | 48.77 | 49.17 | 48.47 | 48.23 | *48.66* |
| ***Means*** | *49.03* | *49.45* | *48.92* | *48.82* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.34 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

## Location 2: Cunderdin

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Cunderdin NVT | **Sowing Date:** | 31/05/2018 |
| **Varieties:** | |  | | --- | | Scepter & Trojan | | **Harvest Date:** | 14/11/2018 |
| **Previous Crop:** | Pasture |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Cunderdin NVT | **Sowing Date:** | 31/05/2018 |
| **Varieties:** | |  | | --- | | La Trobe & Bass | | **Harvest Date:** | 8/11/2018 |
| **Previous Crop:** | Pasture |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Cunderdin NVT | **Sowing Date:** | | 2/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 8/11/2018 |
| **Previous Crop:** | Wheat |  | |  |
| |  | | --- | | ***Weather Conditions*** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -0.2°C on Aug 11, -0.5 °C on Aug 23, -0.1 °C on Sep 6, -2.1 °C on Sep 15, -2.5 °C on Sep 16.  Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 34.2 °C on Sep 20, 33.4 °C on Sep 21, 36.9 °C on Sep 22, 36.6 °C on Sep 23, 32.2 °C on Sep 24, 33.1 °C on Sep 30, 32.7 °C on Oct 10, 33.5 °C on Oct 11, 34.3 °C on Oct 16, 38.6 °C on Oct 17, 33.3 °C on Oct 23, 34.1 °C on Oct 25, 36.1 °C on Oct 26, 32.2 °C on Oct 27, 36.3 °C onOct 28, 41.7 °C on Oct 29, 32.3 °C on Oct 30. Interpret results with caution. | | | | | | | |

***Rainfall (mm) Data Source:***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 16.4 | 8.4 | 0.4 | 8 | 22.4 | 47.6 | 66 | 68.2 | 7.8 | 28.4 | 0.4 | 18.4 |

***Soil Testing***

1. ***Cereals***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Sodosols  Sodosols: soils with strong texture contrast between topsoil and subsoil horizons. Thesesoils are not strongly acid but are sodic and have an ESP greater than 6. |
| ***Sub-Order*** | Grey |
| ***Identification Source*** | CSIRO Map |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | *23/03/2018* | 0-10 | 1.5 | 39.0 | 52.00 | Colwell |
|  | 23/03/2018 | *10-60* | 1.5 | 15.0 | 56.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***23/03/2018*** | 1.6 | 7.00 | 6.30 | 0.2 | Na |
|  | ***23/03/2018*** | 1.1 | 5.60 | 4.80 | 0.1 | 9.6 |

1. ***Canola***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Chromosols  Chromosols: soils with a strong texture contrast between the topsoil and subsoil. Subsoils are not strongly acid and are not sodic |
| ***Sub-Order*** | Grey |
| ***Identification Source*** | CSIRO Map |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***23/03/2018*** | 0.10 | 1.5 | 52.0 | 38.00 | Colwell |
|  | ***23/03/2018*** | 10-60 | 1 | 17.0 | 22.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***23/03/2018*** | 1.1 | 6.60 | 6.10 | 0.2 | Na |
|  | ***23/03/2018*** | 0.9 | 5.90 | 5.10 | 0.1 | 6.2 |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 20/07/2018
* Canola applied 13/07/2018

***Results***

1. ***WHEAT***

Table 76: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 126 | 128 | 128 | 123 | *126* |
| **Trojan** | 116 | 129 | 119 | 125 | *122* |
| ***Means*** | *121* | *129* | *124* | *124* |  |
|  | Significance (Variety) P= 0.032 | | | l.s.d (P<0.05) = | 3.6 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= 0.048 | | | l.s.d (P<0.05) = | 7.3 |

Table 77: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 9.0 | 9.0 | *9.0* |
| **Trojan** | 8.7 | 9.0 | 9.0 | 8.7 | *8.8* |
| ***Means*** | *8.8* | *9.0* | *9.0* | *8.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 78: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 8.3 | 9.0 | *8.8* |
| **Trojan** | 7.3 | 8.3 | 7.3 | 8.3 | *7.8* |
| ***Means*** | *8.2* | *8.7* | *7.8* | *8.7* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P= 0.02 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 79: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.034 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 80: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.58 | 0.66 | 0.55 | 0.66 | *0.61* |
| **Trojan** | 0.58 | 0.59 | 0.66 | 0.65 | *0.62* |
| ***Means*** | *0.58* | *0.62* | *0.61* | *0.66* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 257 | 258 | 257 | 257 | *258* |
| **Trojan** | 268 | 266 | 265 | 268 | *267* |
| ***Means*** | *263* | *262* | *261* | *263* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 1.3 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **Scepter** | 5.0 | 5.9 | 7.5 | 7.7 |
| **Trojan** | 9.6 | 7.4 | 8.4 | 8.2 |

Note: No statistical analysis can be completed as only one replicate was assessed.

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 3.40 | 4.01 | 3.90 | 4.67 | *3.99* |
| **Trojan** | 3.07 | 3.60 | 3.90 | 3.94 | *3.64* |
| ***Means*** | 3.23 | 4.00 | 3.90 | 4.30 |  |
|  | Significance (Variety) P= 0.01 | | | l.s.d (P<0.05) = | 0.259 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.367 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.1 | 8.1 | 8.8 | 9.1 | *8.5* |
| **Trojan** | 8.8 | 8.7 | 9.2 | 9.9 | *9.2* |
| ***Means*** | 8.4 | 8.4 | 9.0 | 9.5 |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.2 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.29 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 83.7 | 84.0 | 84.6 | 84.9 | 84.3 |
| **Trojan** | 85.5 | 85.8 | 85.6 | 85.9 | 85.7 |
| ***Means*** | 84.6 | 84.9 | 85.1 | 85.4 |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.32 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.46 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 12: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1.02 | 1.06 | 1.21 | 1.16 | 1.11 |
| **Trojan** | 0.32 | 0.27 | 0.37 | 0.32 | 0.32 |
| ***Means*** | 0.67 | 0.67 | 0.79 | 0.74 |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.11 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

1. ***BARLEY***

Data analysis was not completed on the Yardstick barley trial. Soil type variation across the site resulted in variable growth, compromising the statistical validity of the trial.

1. ***CANOLA***

Table 81: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 51 | 53 | 52 | 52 | *52* |
| **InVigor T4510** | 49 | 56 | 51 | 52 | *52* |
| ***Means*** | *50* | *55* | *52* | *52* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 82: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 8.3 | 9.0 | 9.0 | 8.7 | *8.8* |
| **InVigor T4510** | 8.7 | 8.7 | 8.7 | 9.0 | *8.8* |
| ***Means*** | *8.5* | *8.8* | *8.8* | *8.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 83: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 8.7 | 9.0 | 8.7 | 9.0 | *8.8* |
| **InVigor T4510** | 7.7 | 8.3 | 9.0 | 8.7 | *8.4* |
| ***Means*** | *8.2* | *8.7* | *8.8* | *8.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 4: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.65 | 0.68 | 0.68 | 0.69 | *0.67* |
| **InVigor T4510** | 0.65 | 0.66 | 0.66 | 0.67 | *0.66* |
| ***Means*** | *0.65* | *0.67* | *0.67* | *0.68* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.008 | | | l.s.d (P<0.05) = | 0.015 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 5: Days to 50% flowering canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 229 | 227 | 227 | 229 | *228* |
| **InVigor T4510** | 229 | 229 | 229 | 229 | *229* |
| ***Means*** | *229* | *228* | *228* | *229* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 1.84 | 2.12 | 2.18 | 2.48 | *2.16* |
| **InVigor T4510** | 1.83 | 2.01 | 2.11 | 2.33 | *2.07* |
| ***Means*** | *1.84* | *2.06* | *2.15* | *2.41* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.181 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Protein (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 17.4 | 17.3 | 17.5 | 18.6 | *17.7* |
| **InVigor T4510** | 16.5 | 16.2 | 16.1 | 17.1 | *16.5* |
| ***Means*** | *16.9* | *16.8* | *16.8* | *17.9* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Decile) P= 0.048 | | | l.s.d (P<0.05) = | 0.86 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Oil canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 49.1 | 48.7 | 48.5 | 47.5 | *48.4* |
| **InVigor T4510** | 45.3 | 44.6 | 45.8 | 45.0 | *45.2* |
| ***Means*** | *47.2* | *46.7* | *47.1* | *46.3* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.28 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.40 |
|  | Significance (Variety\*Decile) P= 0.002 | | | l.s.d (P<0.05) = | 0.56 |

## Location 3: Kalannie

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Kalannie NVT | **Sowing Date:** | 20/05/2018 |
| **Varieties:** | |  | | --- | | Scepter & Trojan | | **Harvest Date:** | 19/11/2018 |
| **Previous Crop:** | Fallow |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Kalannie NVT | **Sowing Date:** | 20/05/2018 |
| **Varieties:** | |  | | --- | | La Trobe & Bass | | **Harvest Date:** | 3/11/2018 |
| **Previous Crop:** | Fallow |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Kalannie NVT | **Sowing Date:** | | 20/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 3/11/2018 |
| **Previous Crop:** | Fallow |  | |  |
| |  | | --- | | ***Weather Conditions*** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -0.8°C on Aug 10, -0.5 °C on Aug 11, -0.7 °C on Aug 12, -0.9 °C on Aug 13, -0.1 °C on Aug 17, -2.1°C on Aug 18, -0.1 °C on Aug 19, -0.2 °C on Aug 25, -1.2 °C on Sep 6, -0.3 °C on Sep 11, -0.8 °C on Sep 14, -4.1 °C on Sep 15, -3.4 °C on Sep 16, -0.6 °C on Sep 20. Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 33.4 °C on Sep 3, 33 °C on Sep 22, 33.2 °C on Sep 23, 33.1 °C on Sep 25, 32.3 °C on Sep 30, 32.2 °C on Oct 9, 32.7 °C on Oct 11, 34.8 °C on Oct 17, 33.5 °C on Oct 25, 36.2 °C on Oct 28, 37.3 °C on Oct 29. Interpret results with caution. | | | | | | | |

***Rainfall (mm) Data Source:***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 77.2 | 11 | 6.8 | 2 | 17.8 | 48.8 | 56 | 59.8 | 4.8 | 36.4 | 10.4 | 0 |

***Soil Testing***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Kandosols  Kandosols: soils that lack a strong texture contrast between the topsoil and subsoil, having at best a weakly-structured subsoil and not calcareous throughout. |
| ***Sub-Order*** | Red |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***16/03/2018*** | 0-10 | 1.0 | 43.0 | 27.00 | Colwell |
|  | ***16/03/2018*** | 10-60 | 1.0 | 4.0 | 8.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***16/03/2018*** | 1.1 | 5.90 | 5.20 | 0.3 | Na |
|  | ***16/03/2018*** | 0.5 | 5.30 | 4.20 | 0.0 | 8.3 |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 16/07/2018
* Canola applied 09/07/2018

***Results***

***WHEAT***

Table 84: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 114 | 105 | 110 | 108 | *109* |
| **Trojan** | 112 | 115 | 111 | 111 | *112* |
| ***Means*** | *113* | *110* | *111* | *109* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 85: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 9.0 | 9.0 | *9.0* |
| **Trojan** | 9.0 | 8.7 | 9.0 | 9.0 | *8.9* |
| ***Means*** | 9.0 | 8.8 | 9.0 | 9.0 |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 86: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.3 | 9.0 | 9.0 | 9.0 | *8.8* |
| **Trojan** | 7.7 | 8.7 | 8.7 | 8.7 | *8.4* |
| ***Means*** | 8.0 | 8.8 | 8.8 | 8.8 |  |
|  | Significance (Variety) P= 0.047 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P= 0.017 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 87: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 88: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.51 | 0.60 | 0.59 | 0.65 | *0.59* |
| **Trojan** | 0.41 | 0.46 | 0.48 | 0.48 | *0.46* |
| ***Means*** | *0.46* | *0.53* | *0.53* | *0.57* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.037 |
|  | Significance (Decile) P= 0.004 | | | l.s.d (P<0.05) = | 0.052 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 257 | 253 | 253 | 254 | *254* |
| **Trojan** | 263 | 260 | 260 | 261 | *261* |
| ***Means*** | *260* | *257* | *257* | *258* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 2.2 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **Scepter** | 9.0 | 8.0 | 6.1 | 6.3 |
| **Trojan** | 10.4 | 12.4 | 15.6 | 16.2 |

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 2.34 | 2.66 | 2.86 | 3.08 | *2.74* |
| **Trojan** | 1.19 | 1.52 | 1.39 | 1.57 | *1.42* |
| ***Means*** | *1.77* | *2.09* | *2.13* | *2.33* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.14 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.198 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.2 | 9.6 | 10.1 | 10.0 | *9.9* |
| **Trojan** | 10.4 | 10.6 | 12.1 | 13.2 | *11.6* |
| ***Means*** | 9.8 | 10.1 | 11.1 | 12.0 |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.22 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.32 |
|  | Significance (Variety\*Decile) P= 0.002 | | | l.s.d (P<0.05) = | 0.45 |

Table 10: Hectolitre weight (kg/hL)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 80.5 | 81.1 | 80.4 | 80.0 | *80.5* |
| **Trojan** | 83.3 | 82.5 | 81.5 | 81.9 | *82.3* |
| ***Means*** | *81.9* | *81.8* | *81.0* | *80.9* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.73 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 2.0 | 1.4 | 1.7 | 1.5 | *1.7* |
| **Trojan** | 1.4 | 1.3 | 1.8 | 1.9 | *1.6* |
| ***Means*** | *1.7* | *1.4* | *1.8* | *1.7* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

BARLEY  
  
Table 89: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** | |
| **LaTrobe** | 113 | 107 | 113 | | 107 | | *110* | |
| **Bass** | 114 | 107 | 108 | | 111 | | *110* | |
| ***Means*** | *114* | *107* | *111* | | *109* | |  | |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | | n.a | |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | | n.a | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | | n.a | |

Table 90: Crop emergence (0-9) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 9.0 | 9.0 | 9.0 | | 9.0 | | *9.0* |
| **Bass** | 9.0 | 8.7 | 9.0 | | 9.0 | | *8.9* |
| ***Means*** | *9.0* | *8.8* | *9.0* | | *9.0* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 91: Crop vigour (0-9) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 9.0 | 8.7 | 8.9 | | 8.7 | | *8.8* |
| **Bass** | 8.3 | 8.7 | 8.3 | | 8.9 | | *8.6* |
| ***Means*** | *8.7* | *8.7* | *8.6* | | *8.8* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 92: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 2 | 2 | 3 | | 2 | | *2* |
| **Bass** | 3 | 3 | 3 | | 3 | | *3* |
| ***Means*** | *2* | *3* | *3* | | *2* | |  |
|  | Significance (Variety) P=0.002 | | | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 93: NDVI reading barley

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | | ***Means*** |
| **LaTrobe** | 0.54 | 0.59 | 0.65 | 0.62 | | *0.60* |
| **Bass** | 0.62 | 0.64 | 0.66 | 0.71 | | *0.66* |
| ***Means*** | *0.58* | *0.62* | *0.65* | *0.66* | |  |
|  | Significance (Variety) P <0.001 | | | | l.s.d (P<0.05) = | 0.028 |
|  | Significance (Decile) P=0.002 | | | | l.s.d (P<0.05) = | 0.039 |
|  | Significance (Variety\*Decile) P=NS | | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | | ***Means*** | |
| **LaTrobe** | 247 | 247 | 249 | 248 | | *247* | |
| **Bass** | 250 | 248 | 248 | 257 | | *251* | |
| ***Means*** | *249* | *248* | *248* | *252* | |  | |
|  | Significance (Variety) P=0.04 | | | | l.s.d (P<0.05) = | | 3.2 | |
|  | Significance (Decile) P=0.03 | | | | l.s.d (P<0.05) = | | 4.5 | |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | | n.a | |

Table 7: Floret Sterility (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **LaTrobe** | 8.8 | 10.8 | 9.6 | 6.2 |
| **Bass** | 8.7 | 15.4 | 11.7 | 7.2 |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | | ***Means*** | |
| **LaTrobe** | 1.88 | 2.30 | 2.33 | 2.25 | | *2.19* | |
| **Bass** | 1.51 | 1.64 | 1.71 | 1.84 | | *1.68* | |
| ***Means*** | *1.70* | *1.97* | *2.02* | *2.05* | |  | |
|  | Significance (Variety) P <0.001 | | | | l.s.d (P<0.05) = | | 0.169 | |
|  | Significance (Decile) P=0.03 | | | | l.s.d (P<0.05) = | | 0.239 | |
|  | Significance (Variety\*Decile) P=NS | | | | l.s.d (P<0.05) = | | n.a | |

Table 9: Protein (%) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** | |
| **LaTrobe** | 9.6 | 12.6 | 12.7 | | 13.7 | | *12.2* | |
| **Bass** | 11.3 | 12.1 | 13.5 | | 12.7 | | *12.4* | |
| ***Means*** | *10.5* | *12.4* | *13.1* | | *13.2* | |  | |
|  | Significance (Variety) P= | | |  | | l.s.d (P<0.05) = | | 1.26 | |
|  | Significance (Decile) P=0.02 | | | | | l.s.d (P<0.05) = | | 1.78 | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | | n.a | |

Table 10: Colour (%) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** | |
| **LaTrobe** | 66.4 | 83.7 | 70.8 | | 84.9 | | *76.5* | |
| **Bass** | 62.8 | 79.8 | 76.8 | | 69.9 | | *72.3* | |
| ***Means*** | *64.6* | *81.8* | *73.8* | | *77.4* | |  | |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | | n.a | |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | | n.a | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | | n.a | |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 65.3 | 64.9 | 64.9 | 64.3 | *64.9* |
| **Bass** | 61.0 | 57.6 | 61.0 | 58.7 | *59.6* |
| ***Means*** | *63.1* | *61.2* | *63.0* | *61.5* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 12: <2.2 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 4.2 | 5.4 | 4.6 | 5.1 | *4.8* |
| **Bass** | 3.1 | 2.8 | 3.7 | 2.8 | *3.1* |
| ***Means*** | *3.7* | *4.1* | *4.1* | *4.0* |  |
|  | Significance (Variety) P<0.001 | | | l.s.d (P<0.05) = | 0.409 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=0.020 | | | l.s.d (P<0.05) = | 0.818 |

Table 13: 2.2-2.5 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 37.6 | 48.0 | 46.0 | 51.7 | *45.8* |
| **Bass** | 23.3 | 25.1 | 31.0 | 30.1 | *27.4* |
| ***Means*** | *30.4* | *36.6* | *38.6* | *40.9* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 2.449 |
|  | Significance (Decile) P<0.001 | | | l.s.d (P<0.05) = | 3.463 |
|  | Significance (Variety\*Decile) P=0.04 | | | l.s.d (P<0.05) = | 4.898 |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 58.2 | 46.6 | 49.3 | 43.2 | *49.3* |
| **Bass** | 73.5 | 72.0 | 65.6 | 67.1 | *69.5* |
| ***Means*** | *65.8* | *59.3* | *57.3* | *55.1* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 2.62 |
|  | Significance (Decile) P<0.001 | | | l.s.d (P<0.05) = | 3.70 |
|  | Significance (Variety\*Decile) P=0.020 | | | l.s.d (P<0.05) = | 5.24 |

***CANOLA***

Table 94: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 47 | 49 | 47 | 47 | *48* |
| **InVigor T4510** | 46 | 48 | 43 | 45 | *46* |
| ***Means*** | *47* | *48* | *45* | *46* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 95: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 9.0 | 9.0 | 9.0 | 9.0 | *9.0* |
| **InVigor T4510** | 8.3 | 9.0 | 9.0 | 9.0 | *8.8* |
| ***Means*** | *8.7* | *9.0* | *9.0* | *9.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.03 | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Variety\*Decile) P= 0.03 | | | l.s.d (P<0.05) = | 0.4 |

Table 96: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 8.7 | 8.7 | 8.7 | 8.7 | *8.7* |
| **InVigor T4510** | 7.3 | 8.7 | 8.7 | 9.0 | *8.4* |
| ***Means*** | *8* | *8.7* | *8.7* | *8.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.04 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= 0.04 | | | l.s.d (P<0.05) = | 0.8 |

Table 97: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.67 | 0.66 | 0.68 | 0.74 | *0.69* |
| **InVigor T4510** | 0.62 | 0.65 | 0.66 | 0.72 | *0.66* |
| ***Means*** | *0.65* | *0.66* | *0.67* | *0.73* |  |
|  | Significance (Variety) P= 0.014 | | | l.s.d (P<0.05) = | 0.02 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.028 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 98: Days to 50% flowering canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 227 | 224 | 224 | 226 | *225* |
| **InVigor T4510** | 225 | 224 | 223 | 224 | *224* |
| ***Means*** | *226* | *224* | *224* | *225* |  |
|  | Significance (Variety) P= 0.04 | | | l.s.d (P<0.05) = | 0.9 |
|  | Significance (Decile) P <0.006 | | | l.s.d (P<0.05) = | 1.2 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 99: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 1.35 | 1.43 | 1.51 | 1.62 | 1.48 |
| **InVigor T4510** | 1.16 | 1.34 | 1.37 | 1.5 | 1.34 |
| ***Means*** | 1.25 | 1.39 | 1.44 | 1.56 |  |
|  | Significance (Variety) P= 0.001 | | | l.s.d (P<0.05) = | 0.073 |
|  | Significance (Decile) P<0.001 | | | l.s.d (P<0.05) = | 0.103 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Protein (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 21.5 | 21.6 | 21.6 | 22.9 | *21.9* |
| **InVigor T4510** | 20.8 | 21.7 | 22.2 | 22.7 | *21.8* |
| ***Means*** | *21.2* | *21.6* | *21.9* | *22.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P<0.001 | | | l.s.d (P<0.05) = | 0.57 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Oil canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 47.3 | 47.3 | 47.3 | 46.3 | *47.1* |
| **InVigor T4510** | 46.5 | 45.5 | 44.9 | 44.8 | *45.4* |
| ***Means*** | *46.9* | *46.4* | *46.1* | *45.6* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.41 |
|  | Significance (Decile) P= 0.002 | | | l.s.d (P<0.05) = | 0.58 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

## Location 4: Merredin

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Mererdin NVT | **Sowing Date:** | 16/05/2018 |
| **Varieties:** | |  | | --- | | Scepter & Trojan | | **Harvest Date:** | 28/11/2018 |
| **Previous Crop:** | Canola |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Merredin NVT | **Sowing Date:** | 16/05/2018 |
| **Varieties:** | |  | | --- | | LaTrobe & Bass | | **Harvest Date:** | 28/11/2018 |
| **Previous Crop:** |  |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Merredin NVT | **Sowing Date:** | | 01/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 8/11/2018 |
| **Previous Crop:** | Pasture |  | |  |
| |  | | --- | | ***Weather Conditions***   1. ***Cereals*** | | | |  | | | |
|  | | |  | | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -2.1 °C on Aug 11, -1 °C on Aug 18, -1.8 °C on Aug 23, -0.4 °C on Aug 24, -1 °C on Aug 25, -2.9 °C on Sep 6, -0.9 °C on Sep 7, -0.8 °C on Sep 11, -2.6 °C on Sep 12, -1.5 °C on Sep 13, -1.2 °C on Sep 14, -0.2 °C on Sep 15, -2.6 °C on Sep 16, -1.7 °C on Sep 18. Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 33.9 °C on Sep 22, 33.4 °C on Sep 23, 33.2 °C on Oct 11, 34.4 °C on Oct 17, 33.6 °C on Oct 26, 34.1 °C on Oct 28, 39 °C on Oct 29. Interpret results with caution. | | | | | | |

1. ***Canola***

|  |  |
| --- | --- |
| ***Event*** | ***Comments*** |
| ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -1.1 °C on Aug 11, -0.1 °C on Aug 18, -0.4 °C on Aug 23, -0.8 °C on Aug 24, -1.2 °C on Sep 6, -1.3 °C on Sep 12, -0.4 °C on Sep 16, -1.1 °C on Sep 18. Interpret results with caution. |
| ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 34.5 °C on Sep 22, 34.3 °C on Sep 23, 32.9 °C on Oct 11, 35.9 °C on Oct 17, 33.6 °C on Oct 26, 33.6 °C on Oct 28, 39.3 °C on Oct 29. Interpret results with caution. |

***Rainfall (mm) Data Source: DPIRD weather station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 22.8 | 14.4 | 20.8 | 0.8 | 11.6 | 41.4 | 58.8 | 68.8 | 4.4 | 44.4 | 13.4 | 12.8 |

***Soil Testing***

1. ***Cereals***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Kandosols  Kandosols: soils that lack a strong texture contrast between the topsoil and subsoil, havingvat best a weakly-structured subsoil and not calcareous throughout. |
| ***Sub-Order*** | Red |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***21/03/2018*** | 0-10 | 1.0 | 39.0 | 38.00 | Colwell |
|  | ***21/03/2018*** | 10-60 | 1.0 | 4.0 | 19.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***21/03/2018*** | 1.1 | 5.50 | 4.80 | 0.2 | Na |
|  | ***21/03/2018*** | 0.4 | 5.70 | 4.60 | 0.0 | 13.6 |

1. ***Canola***

|  |  |
| --- | --- |
| 1. ***Soil Classification Details*** | |
| ***Order*** | Kandosols  Kandosols: soils that lack a strong texture contrast between the topsoil and subsoil, having at best a weakly-structured subsoil and not calcareous throughout. |
| ***Sub-Order*** | Yellow |
| ***Identification Source*** | CSIRO Soil Mapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***21/03/2018*** | 0-10 | 1.5 | 17.0 | 16.00 | Colwell |
|  | ***21/03/2018*** | 10-60 | 1.5 | 6.0 | 6.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***21/03/2018*** | 0.7 | 5.90 | 5.20 | 0.1 | Na |
|  | ***21/03/2018*** | 0.3 | 5.20 | 4.50 | 0.0 | 2.9 |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 19/07/2018
* Canola applied 12/07/2018

***Results***

***WHEAT***

Table 100: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 115 | 116 | 114 | 114 | *115* |
| **Trojan** | 112 | 113 | 112 | 109 | *111* |
| ***Means*** | *114* | *115* | *113* | *111* |  |
|  | Significance (Variety) P= 0.02 | | | l.s.d (P<0.05) = | 3 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 101: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 8.7 | 9.0 | *8.9* |
| **Trojan** | 9.0 | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *9.0* | *9.0* | *8.8* | *9.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 102: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 8.7 | 9.3 | *8.8* |
| **Trojan** | 8.0 | 8.7 | 8.3 | 8.0 | *8.3* |
| ***Means*** | *8.5* | *8.8* | *8.5* | *8.2* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 103: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 104: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.39 | 0.41 | 0.43 | 0.47 | 0.43 |
| **Trojan** | 0.32 | 0.34 | 0.37 | 0.38 | 0.35 |
| ***Means*** | 0.36 | 0.38 | 0.40 | 0.43 |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.026 |
|  | Significance (Decile) P= 0.006 | | | l.s.d (P<0.05) = | 0.036 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 261 | 258 | 258 | 258 | *259* |
| **Trojan** | 265 | 264 | 264 | 264 | *264* |
| ***Means*** | *263* | *261* | *261* | *261* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.8 |
|  | Significance (Decile) P= 0.004 | | | l.s.d (P<0.05) = | 1.1 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **Scepter** | 4.6 | 6.0 | 5.1 | 4.7 |
| **Trojan** | 2.0 | 10.7 | 10.2 | 10.6 |

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1.58 | 1.71 | 1.64 | 1.55 | *1.62* |
| **Trojan** | 1.08 | 1.29 | 1.34 | 1.25 | *1.24* |
| ***Means*** | *1.33* | *1.50* | *1.49* | *1.40* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.158 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 7.2 | 8.2 | 9.2 | 9.9 | *8.6* |
| **Trojan** | 8.5 | 8.9 | 10.1 | 11.7 | *9.8* |
| ***Means*** | *7.9* | *8.5* | *9.7* | *10.8* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.39 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.56 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 77.9 | 76.7 | 74.8 | 73.4 | *76.0* |
| **Trojan** | 82.1 | 81.6 | 80.4 | 79.2 | *80.8* |
| ***Means*** | *80.0* | *79.1* | *77.6* | *76.8* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.688 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.973 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 3.1 | 6.5 | 9.6 | 10.2 | *7.3* |
| **Trojan** | 2.7 | 3.6 | 6.2 | 8.6 | *5.3* |
| ***Means*** | *2.9* | *5.1* | *7.9* | *9.4* |  |
|  | Significance (Variety) P= 0.003 | | | l.s.d (P<0.05) = | 1.228 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 1.737 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

***BARLEY***

Table 105: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** | |
| **LaTrobe** | 116 | 111 | 115 | | 113 | | *114* | |
| **Bass** | 116 | 110 | 108 | | 110 | | *111* | |
| ***Means*** | *116* | *111* | *112* | | *112* | |  | |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | | n.a |
|  | Significance (Decile) P=0.04 | | | | | l.s.d (P<0.05) = | | 3.9 |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | | n.a |

Table 106: Crop emergence (0-9) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 9.0 | 8.7 | 8.9 | | 9.0 | | *8.9* |
| **Bass** | 8.7 | 9.0 | 8.7 | | 8.9 | | *8.8* |
| ***Means*** | *8.8* | *8.8* | *8.8* | | *9.0* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 107: Crop vigour (0-9) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 9.0 | 8.7 | 8.5 | | 8.7 | | *8.7* |
| **Bass** | 8.3 | 8.7 | 8.0 | | 8.5 | | *8.4* |
| ***Means*** | *8.7* | *8.7* | *8.2* | | *8.6* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 108: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 1 | 2 | 1 | | 2 | | *2* |
| **Bass** | 2 | 2 | 2 | | 2 | | *2* |
| ***Means*** | *2* | *2* | *2* | | *2* | |  |
|  | Significance (Variety) P=0.001 | | | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 109: NDVI reading barley

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | | ***Means*** |
| **LaTrobe** | 0.33 | 0.39 | 0.42 | 0.52 | | *0.42* |
| **Bass** | 0.40 | 0.45 | 0.49 | 0.56 | | *0.48* |
| ***Means*** | *0.36* | *0.42* | *0.46* | *0.54* | |  |
|  | Significance (Variety) P <0.001 | | | | l.s.d (P<0.05) = | 0.027 |
|  | Significance (Decile) P <0.001 | | | | l.s.d (P<0.05) = | 0.038 |
|  | Significance (Variety\*Decile) P=NS | | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 257 | 254 | 258 | | 256 | | *256* |
| **Bass** | 254 | 264 | 260 | | 258 | | *259* |
| ***Means*** | *256* | *259* | *259* | | *257* | |  |
|  | Significance (Variety) P=0.04 | | | | | l.s.d (P<0.05) = | 3.0 |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=0.04 | | | | | l.s.d (P<0.05) = | 5.9 |

Table 7: Floret Sterility (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **LaTrobe** | 7.0 | 5.5 | 6.0 | 3.3 |
| **Bass** | 3.7 | 6.2 | 9.0 | 5.2 |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 1.09 | 1.46 | 1.68 | | 1.85 | | *1.50* |
| **Bass** | 1.16 | 1.43 | 1.47 | | 1.53 | | *1.40* |
| ***Means*** | *1.13* | *1.44* | *1.55* | | *1.69* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | | | l.s.d (P<0.05) = | 0.204 |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 8.1 | 8.2 | 9.8 | | 11.0 | | *9.3* |
| **Bass** | 7.9 | 8.7 | 9.8 | | 10.7 | | *9.3* |
| ***Means*** | *8.0* | *8.5* | *9.8* | | *10.8* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | | | l.s.d (P<0.05) = | 0.82 |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 10: Colour (%) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 62.7 | 63.3 | 64.3 | | 60.1 | | *62.6* |
| **Bass** | 62.6 | 63.1 | 62.6 | | 62.8 | | *62.8* |
| ***Means*** | *62.6* | *63.2* | *63.5* | | *61.5* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 61.4 | 61.8 | 59.9 | 60.0 | *60.8* |
| **Bass** | 64.4 | 64.4 | 63.7 | 62.6 | *63.8* |
| ***Means*** | *62.9* | *63.1* | *61.8* | *61.3* |  |
|  | Significance (Variety) P=0.001 | | | l.s.d (P<0.05) = | 1.592 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 12: <2.2 screenings (%)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 12.0 | 17.7 | 29.1 | 34.5 | *23.3* |
| **Bass** | 3.7 | 4.7 | 10.8 | 15.9 | *8.8* |
| ***Means*** | *7.9* | *11.2* | *20.0* | *25.2* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 4.689 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 6.632 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 13: 2.2-2.5 screenings (%)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 44.0 | 42.0 | 43.2 | 35.9 | *41.3* |
| **Bass** | 12.1 | 19.5 | 27.7 | 31.7 | *22.8* |
| ***Means*** | *28.1* | *30.7* | *35.4* | *33.8* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 7.172 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 44.0 | 40.4 | 27.7 | 29.6 | *35.4* |
| **Bass** | 84.2 | 75.8 | 61.5 | 52.3 | *68.4* |
| ***Means*** | *64.1* | *58.1* | *44.6* | *41.0* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 9.289 |
|  | Significance (Decile) P=0.007 | | | l.s.d (P<0.05) = | 13.137 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

***CANOLA***

Table 110: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 45 | 47 | 45 | 44 | *46* |
| **InVigor T4510** | 43 | 46 | 44 | 46 | *45* |
| ***Means*** | *44* | *47* | *46* | *45* |  |
|  | Significance (Variety) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 111: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 9.0 | 9.0 | 8.7 | 9.0 | *9.0* |
| **InVigor T4510** | 9.0 | 9.0 | 9.0 | 9.0 | *8.9* |
| ***Means*** | *9.0* | *9.0* | *8.8* | *9.0* |  |
|  | Significance (Variety) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 112: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.7 | 8.7 | 9.0 | 9.0 | *8.6* |
| **InVigor T4510** | 7.3 | 8.7 | 8.7 | 9.0 | *8.4* |
| ***Means*** | *7.5* | *8.7* | *8.8* | *9.0* |  |
|  | Significance (Variety) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | |  | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 113: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.42 | 0.46 | 0.56 | 0.67 | *0.53* |
| **InVigor T4510** | 0.38 | 0.48 | 0.56 | 0.68 | *0.53* |
| ***Means*** | *0.40* | *0.47* | *0.56* | *0.68* |  |
|  | Significance (Variety) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | |  | l.s.d (P<0.05) = | 0.036 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 114: Days to 50% flowering canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 231 | 230 | 230 | 232 | *231* |
| **InVigor T4510** | 231 | 230 | 230 | 230 | *230* |
| ***Means*** | *231* | *230* | *230* | *231* |  |
|  | Significance (Variety) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 115: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 1.18 | 1.43 | 1.54 | 1.89 | *1.51* |
| **InVigor T4510** | 1.33 | 1.52 | 1.74 | 1.98 | *1.64* |
| ***Means*** | *1.25* | *1.48* | *1.64* | *1.93* |  |
|  | Significance (Variety) P= 0.03 | |  | l.s.d (P<0.05) = | 0.078 |
|  | Significance (Decile) P <0.001 | |  | l.s.d (P<0.05) = | 0.11 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Protein (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 21.1 | 21.1 | 21.2 | 21.5 | *21.2* |
| **InVigor T4510** | 21.1 | 20.3 | 21.3 | 21.7 | *21.1* |
| ***Means*** | *21.1* | *20.7* | *21.2* | *21.6* |  |
|  | Significance (Variety) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.04 | |  | l.s.d (P<0.05) = | 0.57 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Oil (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 48.4 | 48.3 | 48.4 | 48.3 | *48.3* |
| **InVigor T4510** | 46.9 | 47.7 | 47.1 | 47.1 | *47.2* |
| ***Means*** | *47.6* | *48.0* | *47.8* | *47.7* |  |
|  | Significance (Variety) P <0.001 | |  | l.s.d (P<0.05) = | 0.36 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

## Location 5: Moorine Rock

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Moorine Rock NVT | **Sowing Date:** | 19/05/2018 |
| **Varieties:** | |  | | --- | | Scepter & Trojan | | **Harvest Date:** | 27/11/2018 |
| **Previous Crop:** | Pasture |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Moorine Rock NVT | **Sowing Date:** | 19/05/2018 |
| **Varieties:** | |  | | --- | | La Trobe & Bass | | **Harvest Date:** | 27/11/2018 |
| **Previous Crop:** | Pasture |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Moorine Rock NVT | **Sowing Date:** | | 19/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 27/11/2018 |
| **Previous Crop:** | Pasture |  | |  |
| |  | | --- | | ***Weather Conditions*** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -2.3 °C on Aug 11, -0.3 °C on Aug 12, -1.5 °C on Aug 16, -0.4 °C on Aug 18, -1.4 °C on Sep 6, -1.6 °C on Sep 7, -1.3 °C on Sep 12, -0.5 °C on Sep 13, -1.6 °C on Sep 15, -0.1 °C on Sep 18. Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 32.7 °C on Sep 21, 34.1 °C on Sep 22, 34.6 °C on Sep 23, 34.1 °C on Sep 24, 32.1 °C on Oct 6, 33.5 °C on Oct 11, 34.2 °C on Oct 17, 32.5 °C on Oct 25, 35.4 °C on Oct 26, 35.4 °C on Oct 28, 37.7 °C on Oct 29. Interpret results with caution. | | | | | | | |

***Rainfall (mm) Data Source: DPIRD weather station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 35.4 | 46.6 | 8.2 | 1.8 | 16.2 | 44 | 43.6 | 63.4 | 3.8 | 46.6 | 42.4 | 6.2 |

***Soil Testing***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Tenosols  Tenosols: soils with generally weak pedological organisation in the subsoil |
| ***Sub-Order*** | Brown-Orthic |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***21/03/2018*** | 0-10 | 3 | 19 | 23 | Colwell |
|  | ***21/03/2018*** | 10-60 | 3 | 15 | 13 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***21/03/2018*** | 0.83 | 7.1 | 6.6 | 0.098 | na |
|  | ***21/03/2018*** | 0.64 | 8 | 7.1 | 0.259 | na |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 19/07/2018
* Canola applied 12/07/2018

***Results***

WHEAT

Table 116: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 102 | 91 | 93 | 103 | *97* |
| **Trojan** | 101 | 106 | 99 | 99 | *101* |
| ***Means*** | *101* | *99* | *96* | *101* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 117: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 9.0 | 8.3 | *8.8* |
| **Trojan** | 8.3 | 8.0 | 8.7 | 8.7 | *8.4* |
| ***Means*** | *8.7* | *8.5* | *8.8* | *8.5* |  |
|  | Significance (Variety) P= 0.03 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 118: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.7 | 8.3 | 8.7 | 9.0 | *8.7* |
| **Trojan** | 8.7 | 8.3 | 9.0 | 8.0 | *8.5* |
| ***Means*** | *8.7* | *8.3* | *8.8* | *8.5* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 119: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 2 | 2 | 1 | *2* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *2* | *2* | *1* |  |
|  | Significance (Variety) P= 0.02 | | | l.s.d (P<0.05) = | 0.2 |
|  | Significance (Decile) P= 0.01 | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 120: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.56 | 0.58 | 0.58 | 0.57 | *0.57* |
| **Trojan** | 0.52 | 0.51 | 0.53 | 0.52 | *0.52* |
| ***Means*** | *0.54* | *0.55* | *0.56* | *0.55* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.016 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 269 | 267 | 267 | 268 | *268* |
| **Trojan** | 273 | 274 | 272 | 273 | *273* |
| ***Means*** | *271* | *270* | *269* | *270* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 1.6 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 12.17 | 12.73 | 19.10 | 13.38 | *15.10* |
| **Trojan** | 44.27 | 49.64 | 63.97 | 69.29 | *56.79* |
| ***Means*** | *28.22* | *31.20* | *41.53* | *42.84* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 7.502 |
|  | Significance (Decile) P= 0.023 | | | l.s.d (P<0.05) = | 10.609 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1.25 | 1.37 | 1.20 | 1.29 | *1.28* |
| **Trojan** | 0.63 | 0.51 | 0.48 | 0.36 | *1.50* |
| ***Means*** | *0.94* | *0.94* | *0.84* | *0.83* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.172 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 13.4 | 16.1 | 14.4 | 13.1 | *14.2* |
| **Trojan** | 14.6 | 14.2 | 14.2 | 15.1 | *14.5* |
| ***Means*** | *14.0* | *15.1* | *14.3* | *14.1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 80.0 | 69.2 | 63.8 | 79.6 | *73.2* |
| **Trojan** | 63.5 | 78.1 | 78.7 | 77.1 | *74.4* |
| ***Means*** | *71.8* | *73.7* | *71.2* | *78.4* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1.4 | 1.4 | 1.7 | 1.3 | *1.4* |
| **Trojan** | 2.4 | 1.7 | 1.6 | 1.8 | *1.9* |
| ***Means*** | *1.9* | *1.5* | *1.6* | *1.6* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

BARLEY

Table 121: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 89 | 92 | 97 | 98 | *94* |
| **Bass** | 99 | 99 | 92 | 103 | *98* |
| ***Means*** | *94* | *95* | *94* | *100* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 122: Crop emergence (0-9) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 8.7 | 8.7 | 8.1 | 8.3 | *8.4* |
| **Bass** | 9.0 | 8.7 | 8.7 | 9.1 | *8.9* |
| ***Means*** | *8.8* | *8.7* | *8.4* | *8.7* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 123: Crop vigour (0-9) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 8.7 | 8.7 | 9.1 | 8.7 | *8.8* |
| **Bass** | 8.7 | 8.3 | 8.3 | 8.6 | *8.5* |
| ***Means*** | *8.7* | *8.5* | *8.7* | *8.6* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 124: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 2 | 2 | 2 | 2 | *2* |
| **Bass** | 3 | 4 | 3 | 3 | *3* |
| ***Means*** | *3* | *3* | *3* | *3* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.2 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 125: NDVI reading barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 0.40 | 0.45 | 0.46 | 0.49 | *0.45* |
| **Bass** | 0.57 | 0.59 | 0.61 | 0.64 | *0.60* |
| ***Means*** | *0.49* | *0.52* | *0.54* | *0.56* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.017 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.023 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 271 | 271 | 273 | 269 | *271* |
| **Bass** | 274 | 274 | 275 | 275 | *274* |
| ***Means*** | *273* | *272* | *274* | *272* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 1.2 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 35.2 | 13.9 | 22.3 | 16.8 | *22.0* |
| **Bass** | 24.3 | 30.2 | 26.4 | 30.4 | *27.8* |
| ***Means*** | *29.8* | *22.0* | *24.4* | *23.6* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 1.12 | 1.15 | 1.29 | 1.19 | *1.19* |
| **Bass** | 0.74 | 0.96 | 0.59 | 0.53 | *0.71* |
| ***Means*** | *0.93* | *1.05* | *0.94* | *0.86* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.142 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 13.5 | 14.3 | 14.0 | 16.3 | *14.5* |
| **Bass** | 15.2 | 15.2 | 17.9 | 16.7 | *16.3* |
| ***Means*** | *14.3* | *14.7* | *16.0* | *16.5* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.81 |
|  | Significance (Decile) P=0.004 | | | l.s.d (P<0.05) = | 1.14 |
|  | Significance (Variety\*Decile) P=0.027 | | | l.s.d (P<0.05) = | 1.61 |

Table 10: Colour (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 62.4 | 61.3 | 66.5 | 59.2 | *62.4* |
| **Bass** | 59.3 | 61.9 | 63.8 | 58.7 | *60.9* |
| ***Means*** | *60.9* | *61.6* | *65.1* | *59.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 65.6 | 66.5 | 65.2 | 66.4 | *65.9* |
| **Bass** | 62.0 | 64.9 | 62.6 | 62.8 | *63.1* |
| ***Means*** | *63.8* | *65.7* | *63.9* | *64.6* |  |
|  | Significance (Variety) P=0.003 | | | l.s.d (P<0.05) = | 1.636 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 12: <2.2 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 11.1 | 13.7 | 12.6 | 18.2 | *13.9* |
| **Bass** | 9.0 | 8.5 | 15.6 | 15.9 | *12.2* |
| ***Means*** | *10.0* | *11.1* | *14.1* | *17.1* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=0.019 | | | l.s.d (P<0.05) = | 4.429 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 13: 2.2-2.5 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 58.0 | 61.4 | 58.2 | 61.3 | *59.7* |
| **Bass** | 33.8 | 36.3 | 39.9 | 42.3 | *38.1* |
| ***Means*** | *45.9* | *48.9* | *49.0* | *51.8* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 2.894 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 30.9 | 24.9 | 29.2 | 20.5 | *26.4* |
| **Bass** | 57.2 | 55.2 | 44.5 | 41.8 | *49.7* |
| ***Means*** | *44.0* | *40.1* | *36.8* | *31.1* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 5.501 |
|  | Significance (Decile) P=0.022 | | | l.s.d (P<0.05) = | 7.779 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

CANOLA  
  
Table 126: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 42 | 45 | 47 | 46 | *45* |
| **InVigor T4510** | 44 | 50 | 43 | 46 | *46* |
| ***Means*** | *43* | *48* | *45* | *46* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 127: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.7 | 8.7 | 8.0 | 8.0 | *8.1* |
| **InVigor T4510** | 7.7 | 8.3 | 8.3 | 8.0 | *8.1* |
| ***Means*** | *7.7* | *8.5* | *8.2* | *8.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 128: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.7 | 8.3 | 8.3 | 7.7 | *8.0* |
| **InVigor T4510** | 8.0 | 7.7 | 7.3 | 8.3 | *7.8* |
| ***Means*** | *7.8* | *8.0* | *7.8* | *8.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 129: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.43 | 0.46 | 0.55 | 0.66 | *0.52* |
| **InVigor T4510** | 0.38 | 0.49 | 0.56 | 0.66 | *0.52* |
| ***Means*** | *0.40* | *0.48* | *0.56* | *0.66* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.045 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

*Note: due to the split emergence, no 50% flowering data was collected*

Table 130: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.16 | 0.20 | 0.14 | 0.17 | *0.17* |
| **InVigor T4510** | 0.22 | 0.24 | 0.20 | 0.16 | *0.21* |
| ***Means*** | *0.19* | *0.22* | *0.17* | *0.16* |  |
|  | Significance (Variety) P= 0.013 | | | l.s.d (P<0.05) = | 0.03 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 131: Protein (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 28.9 | 28.6 | 29.6 | 28.5 | *28.9* |
| **InVigor T4510** | 28.6 | 29.5 | 30.1 | 30.2 | *29.6* |
| ***Means*** | *28.8* | *29.0* | *29.9* | *29.4* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Oil (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 37.0 | 38.0 | 36.1 | 37.4 | *37.1* |
| **InVigor T4510** | 37.1 | 35.4 | 34.2 | 34.6 | *35.3* |
| ***Means*** | *37.1* | *36.7* | *35.1* | *36.0* |  |
|  | Significance (Variety) P= 0.004 | | | l.s.d (P<0.05) = | 1.14 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

## Location 6: Mukinbudin

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Mukinbudin NVT | **Sowing Date:** | 17/05/2018 |
| **Varieties:** | |  | | --- | | Scepter & Trojan | | **Harvest Date:** | 08/11/2018 |
| **Previous Crop:** | Pasture |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Mukinbudin NVT | **Sowing Date:** | 17/05/2018 |
| **Varieties:** | |  | | --- | | La Trobe & Bass | | **Harvest Date:** | 08/11/2018 |
| **Previous Crop:** | Pasture |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Merredin Peas NVT | **Sowing Date:** | | 15/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 08/11/2018 |
| **Previous Crop:** | Pasture |  | |  |
| |  | | --- | | ***Weather Conditions***   1. **Cereals** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -1.1 °C on Aug 11, -0.2 °C on Aug 12, -0.5 °C on Aug 13, -0.6 °C on Aug 16, -0.9 °C on Aug 18, -0.5 °C on Aug 25, -0.2 °C on Aug 26, -0.4 °C on Sep 1, -0.2 °C on Sep 2, -1.6 °C on Sep 6, -0.1 °C on Sep 7, -1 °C on Sep 12, -0.1 °C on Sep 13, -2.6 °C on Sep 15, -2.8 °C on Sep 16. Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 32 °C on Sep 21, 34 °C on Sep 22, 34.4 °C on Sep 23, 32.6 °C on Sep 24, 33.6 °C on Oct 10, 32.1 °C on Oct 11, 32.3 °C on Oct 16, 35.9 °C on Oct 17, 34 °C on Oct 25, 36 °C on Oct 26, 33 °C on Oct 27, 35.5 °C on Oct 28, 39.6 °C on Oct 29, 33.1 °C on Oct 30. Interpret results with caution. | | | | | | | |

1. ***Canola***

|  |  |
| --- | --- |
| ***Event*** | ***Comments*** |
| ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -0.5 °C on Aug 11, -0.1 °C on Aug 23, -0.3 °C on Aug 25, -1 °C on Sep 6, -0.5 °C on Sep 7, -0.7 °C on Sep 12, -0.9 °C on Sep 13, -1.4 °C on Sep 15. Interpret results with caution. |
| ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 32.3 °C on Sep 20, 33.8 °C on Sep 21, 37.5 °C on Sep 22, 37.5 °C on Sep 23, 34.3 °C on Sep 24, 34.4 °C on Sep 25, 38.2 °C on Sep 26, 32.7 °C on Sep 27, 32.8 °C on Oct 8, 38.1 °C on Oct 9, 35.5 °C on Oct 10, 38.2 °C on Oct 11, 32.6 °C on Oct 15, 37.8 °C on Oct 16, 41.8 °C on Oct 17, 34.6 °C on Oct 20, 32.7 °C on Oct 22, 40.2 °C on Oct 23, 41.7 °C on Oct 25, 43.2 °C on Oct 26, 42.9 °C on Oct 27, 46.6 °C on Oct 28, 46 °C on Oct 29, 42.5 °C on Oct 30. Interpret  results with caution. |

***Rainfall Cereals (mm) Data Source:***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 25.8 | 28.2 | 8.8 | 0.6 | 11.4 | 39.8 | 30.8 | 36.8 | 12.8 | 27.4 | 24 | 2.4 |

***Rainfall Canola (mm) Data Source:***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 22.8 | 14.4 | 20.8 | 0.8 | 11.6 | 41.4 | 58.8 | 68.8 | 4.4 | 44.4 | 1..4 | 12.8 |

***Soil Testing***

1. ***Cereals***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Calcarosols  Calcarosols: soils that are usually calcareous throughout the soil profile (often highly  calcareous). |
| ***Sub-Order*** | Calcic |
| ***Identification Source*** | CSIRO Soil Mapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***15/03/2018*** | 0-10 | 3.0 | 13.0 | 30.00 | Colwell |
|  | ***15/03/2018*** | 10-60 | 2.5 | 8.01 | 12.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***15/03/2018*** | 0.6 | 6.1 | 5.0 | 0 | Na |
|  | ***15/03/2018*** | 0.4 | 6.1 | 5.1 | 0 | 1.4 |

1. ***Canola***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Chromosols  Chromosols: soils with a strong texture contrast between the topsoil and subsoil. Subsoils are not strongly acid and are not sodic |
| ***Sub-Order*** | Red |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***21/03/2018*** | 0-10 | 3.0 | 26.0 | 53.00 | Colwell |
|  | ***21/03/2018*** | 10-60 | 2.5 | 11.0 | 21.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***21/03/2018*** | 0.7 | 6.20 | 5.10 | 0.1 | Na |
|  | ***21/03/2018*** | 0.4 | 6.70 | 5.40 | 0.0 | 9.5 |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 16/07/2018
* Canola applied 09/07/2018

***Results***

***WHEAT***

Table 132: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 96 | 91 | 85 | 92 | *91* |
| **Trojan** | 84 | 89 | 85 | 86 | *86* |
| ***Means*** | *90* | *90* | *85* | *89* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 133: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.0 | 8.7 | 7.7 | 8.7 | *8.3* |
| **Trojan** | 7.3 | 8.0 | 8.0 | 7.3 | *7.7* |
| ***Means*** | *7.7* | *8.3* | *7.8* | *8.0* |  |
|  | Significance (Variety) P=0.043 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a. |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a. |

Table 134: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.0 | 9.0 | 9.0 | 8.7 | *8.7* |
| **Trojan** | 7.7 | 8.0 | 8.7 | 8.0 | *8.1* |
| ***Means*** | *7.8* | *8.5* | *8.8* | *8.3* |  |
|  | Significance (Variety) P= 0.015 | | | l.s.d (P<0.05) = | 0.5 |
|  | Significance (Decile) P= 0.033 | | | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 135: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.016 | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 136: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.28 | 0.34 | 0.40 | 0.40 | *0.36* |
| **Trojan** | 0.24 | 0.32 | 0.35 | 0.34 | *0.31* |
| ***Means*** | *0.26* | *0.33* | *0.37* | *0.37* |  |
|  | Significance (Variety) P= 0.003 | | | l.s.d (P<0.05) = | 0.026 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.037 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 264 | 265 | 265 | 265 | *265* |
| **Trojan** | 270 | 270 | 268 | 273 | *271* |
| ***Means*** | *267* | *268* | *267* | *269* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 2.5 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **Scepter** | 2.7 | 6.8 | 7.7 | 4.5 |
| **Trojan** | 20.4 | 6.2 | 9.8 | 14.0 |

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.9 | 1.3 | 1.4 | 1.3 | *1.2* |
| **Trojan** | 0.9 | 0.9 | 1.2 | 0.8 | *0.9* |
| ***Means*** | *0.9* | *1.1* | *1.3* | *1.1* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.128 |
|  | Significance (Decile) P= 0.006 | | | l.s.d (P<0.05) = | 0.181 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 10.1 | 10.2 | 11.2 | 11.7 | *10.8* |
| **Trojan** | 11.6 | 12.1 | 12.4 | 13.6 | *12.4* |
| ***Means*** | *10.8* | *11.1* | *11.8* | *12.7* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.29 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 84.7 | 84.8 | 84.5 | 84.3 | *84.6* |
| **Trojan** | 83.1 | 83.9 | 84.4 | 83.6 | *83.8* |
| ***Means*** | *83.9* | *84.4* | *84.5* | *84.0* |  |
|  | Significance (Variety) P= 0.005 | | | l.s.d (P<0.05) = | 0.53 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 3.0 | 2.7 | 2.2 | 2.4 | *2.6* |
| **Trojan** | 0.2 | 0.8 | 0.8 | 0.8 | *0.7* |
| ***Means*** | *1.6* | *1.8* | *1.5* | *1.6* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

***BARLEY***

Table 137: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** | |
| **LaTrobe** | 94 | 99 | 94 | | 94 | | *95* | |
| **Bass** | 94 | 99 | 94 | | 100 | | *97* | |
| ***Means*** | *94* | *99* | *94* | | *97* | |  | |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | | n.a | |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | | n.a | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | | n.a | |

Table 138: Crop emergence (0-9) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 8.7 | 8.7 | 7.9 | | 8.3 | | *8.4* |
| **Bass** | 8.3 | 8.3 | 9.0 | | 8.4 | | *8.5* |
| ***Means*** | *8.5* | *8.5* | *8.4* | | *8.4* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 139: Crop vigour (0-9) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 9.0 | 9.0 | 8.5 | | 9.0 | | *8.9* |
| **Bass** | 8.0 | 8.3 | 8.7 | | 9.0 | | *8.5* |
| ***Means*** | *8.5* | *8.7* | *8.6* | | *9.0* | |  |
|  | Significance (Variety) P=0.02 | | | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=0.03 | | | | | l.s.d (P<0.05) = | 0.6 |

Table 140: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 2 | 2 | 3 | | 2 | | *2* |
| **Bass** | 3 | 3 | 3 | | 3 | | *3* |
| ***Means*** | *2* | *3* | *3* | | *3* | |  |
|  | Significance (Variety) P <0.001 | | | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 141: NDVI reading barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 0.31 | 0.43 | 0.40 | | 0.35 | | *0.37* |
| **Bass** | 0.31 | 0.43 | 0.42 | | 0.48 | | *0.41* |
| ***Means*** | *0.31* | *0.43* | *0.41* | | *0.42* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 271 | 262 | 265 | | 258 | | *264* |
| **Bass** | 276 | 274 | 275 | | 274 | | *275* |
| ***Means*** | *273* | *268* | *270* | | *266* | |  |
|  | Significance (Variety) P <0.001 | | | | | l.s.d (P<0.05) = | 3.6 |
|  | Significance (Decile) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **LaTrobe** | 6.1 | 5.8 | 6.8 | 4.2 |
| **Bass** | 8.1 | 6.5 | 8.7 | 6.2 |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 1.07 | 1.54 | 1.45 | 1.55 | *1.40* |
| **Bass** | 0.63 | 1.00 | 0.98 | 1.09 | *0.93* |
| ***Means*** | *0.85* | *1.27* | *1.22* | *1.32* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.146 |
|  | Significance (Decile) P=0.001 | | | l.s.d (P<0.05) = | 0.206 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 11.4 | 13.4 | 11.9 | 12.2 | *12.2* |
| **Bass** | 13.8 | 13.1 | 14.7 | 14.8 | *14.1* |
| ***Means*** | *12.6* | *13.3* | *13.3* | *13.5* |  |
|  | Significance (Variety) P=0.002 | | | l.s.d (P<0.05) = | 1.00 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Colour (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 64.3 | 65.5 | 58.4 | 79.6 | *67.0* |
| **Bass** | 63.4 | 61.5 | 68.2 | 62.6 | *64.0* |
| ***Means*** | *64.3* | *78.5* | *63.3* | *71.1* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 68.4 | 66.1 | 72.4 | 67.9 | *68.7* |
| **Bass** | 63.5 | 66.1 | 65.7 | 65.8 | *65.3* |
| ***Means*** | *66.0* | *66.0* | *69.1* | *66.8* |  |
|  | Significance (Variety) P < 0.001 | | | l.s.d (P<0.05) = | 1.84 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 12: <2.2 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 4.1 | 4.9 | 3.7 | 5.7 | *4.6* |
| **Bass** | 3.0 | 2.2 | 2.7 | 3.1 | *2.8* |
| ***Means*** | *3.5* | *3.6* | *3.2* | *4.4* |  |
|  | Significance (Variety) P < 0.001 | | | l.s.d (P<0.05) = | 0.7 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 13: 2.2-2.5 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 43.4 | 49.7 | 36.1 | 44.9 | *43.5* |
| **Bass** | 22.8 | 18.6 | 19.8 | 19.5 | *20.2* |
| ***Means*** | *33.1* | *34.2* | *28.0* | *32.1* |  |
|  | Significance (Variety) P < 0.001 | | | l.s.d (P<0.05) = | 4.78 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 52.5 | 45.4 | 60.2 | 49.4 | *51.9* |
| **Bass** | 74.2 | 79.1 | 77.5 | 77.4 | *77.1* |
| ***Means*** | *63.4* | *62.2* | *68.8* | *63.4* |  |
|  | Significance (Variety) P < 0.001 | | | l.s.d (P<0.05) = | 5.11 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

***CANOLA***

Table 142: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 27 | 30 | 33 | 28 | *30* |
| **Trojan** | 33 | 37 | 28 | 33 | *32* |
| ***Means*** | *30* | *33* | *31* | *30* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 143: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.0 | 7.0 | 7.7 | 7.3 | *7.3* |
| **InVigor T4510** | 7.0 | 7.0 | 7.3 | 8.0 | *7.3* |
| ***Means*** | *7.0* | *7.0* | *7.5* | *7.7* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 144: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.0 | 7.7 | 8.0 | 8.0 | *7.7* |
| **InVigor T4510** | 7.3 | 7.7 | 7.0 | 8.0 | *7.5* |
| ***Means*** | *7.2* | *7.7* | *7.5* | *8.0* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 145: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.59 | 0.65 | 0.66 | 0.67 | *0.64* |
| **InVigor T4510** | 0.55 | 0.59 | 0.63 | 0.66 | *0.61* |
| ***Means*** | *0.57* | *0.62* | *0.65* | *0.67* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= 0.04 | | | l.s.d (P<0.05) = | 0.068 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 146: Days to 50% flowering canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 234 | 232 | 232 | 233 | *233* |
| **InVigor T4510** | 232 | 231 | 230 | 231 | *231* |
| ***Means*** | *233* | *231* | *231* | *232* |  |
|  | Significance (Variety) P= 0.02 | | | l.s.d (P<0.05) = | 1.3 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 147: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.09 | 0.07 | 0.08 | 0.11 | *0.09* |
| **InVigor T4510** | 0.05 | 0.08 | 0.07 | 0.08 | *0.07* |
| ***Means*** | *0.07* | *0.08* | *0.08* | *0.09* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

*NOTE: No grain quality data provided due to extensive bird damage resulting in insufficient seed quantities.*

## Location 7: Yealering

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Yealering NVT | **Sowing Date:** | 22/05/2018 |
| **Varieties:** | |  | | --- | | Scepter and Trojan | | **Harvest Date:** | 04/12/2018 |
| **Previous Crop:** | Lupin |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | Yealering NVT | **Sowing Date:** | 22/05/2018 |
| **Varieties:** | |  | | --- | | La Trobe & Bass | | **Harvest Date:** | 04/12/2018 |
| **Previous Crop:** | Lupin |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Yealering NVT | **Sowing Date:** | | 22/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 04/12/2018 |
| **Previous Crop:** | Lupin |  | |  |
| |  | | --- | | ***Weather Conditions*** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -0.3 °C on Aug 5, -0.4 °C on Aug 10, -0.6 °C on Aug 11, -0.2 °C on Aug 12, -0.2 °C on Sep 6, -1.4 °C on Sep 14, -2.9 °C on Sep 15, -0.8 °C on Sep 16. Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 32.3 °C on Sep 21, 34.2 °C on Sep 22, 32.9 °C on Sep 23, 32.7 °C on Sep 30, 33.4 °C on Oct 11, 35.5 °C on Oct 17, 32.9 °C on Oct 25, 35.7 °C on Oct 28, 35.5 °C on Oct 29. Interpret results with caution. | | | | | | | |

***Rainfall (mm) Data Source: DPIRD weather station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 44.6 | 9.4 | 3.8 | 2.6 | 22.4 | 65 | 55.6 | 68.2 | 6.6 | 22.8 | 7 | 0 |

***Soil Testing***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Chromosols  Chromosols: soils with a strong texture contrast between the topsoil and subsoil. Subsoils are not strongly acid and are not sodic |
| ***Sub-Order*** | Brown |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***15/03/2018*** | 0-10 | 1.5 | 17.0 | 15.00 | Colwell |
|  | ***15/03/2018*** | 10-60 | 1.5 | 10.0 | 10.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***15/03/2018*** | 1.3 | 6.40 | 5.40 | 0.1 | Na |
|  | ***15/03/2018*** | 0.8 | 6.40 | 5.40 | 0.0 | 2.3 |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 20/07/2018
* Canola applied 13/07/2018

***Results***

***WHEAT***

Table 148: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 116 | 135 | 125 | 115 | 123 |
| **Trojan** | 118 | 125 | 126 | 114 | 121 |
| ***Means*** | 117 | 130 | 120 | 119 |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 149: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8 | 9 | 8.3 | 8.7 | *8.5* |
| **Trojan** | 8.3 | 8 | 8 | 8.7 | *8.3* |
| ***Means*** | *8.2* | *8.5* | *8.2* | *8.7* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

Table 150: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8 | 9 | 8.7 | 8.7 | *8.6* |
| **Trojan** | 7.3 | 7.7 | 8 | 8 | *7.8* |
| ***Means*** | *7.7* | *8.3* | *8.3* | *8.3* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P= 0.03 | | | l.s.d (P<0.05) = | 0.5 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 151: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

Table 152: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.53 | 0.63 | 0.60 | 0.64 | *0.60* |
| **Trojan** | 0.48 | 0.56 | 0.54 | 0.57 | *0.54* |
| ***Means*** | 0.51 | 0.59 | 0.57 | 0.61 |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.036 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.051 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 269 | 264 | 265 | 264 | *265* |
| **Trojan** | 271 | 271 | 271 | 269 | *270* |
| ***Means*** | *270* | *267* | *268* | *267* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 2.1 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **Scepter** | 6.5 | 7.7 | 5.2 | 5.4 |
| **Trojan** | 7.0 | 9.7 | 5.1 | 3.6 |

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 3.17 | 3.70 | 3.80 | 3.91 | 3.64 |
| **Trojan** | 2.58 | 3.23 | 2.81 | 3.06 | 2.92 |
| ***Means*** | 2.88 | 3.47 | 3.31 | 3.49 |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.183 |
|  | Significance (Decile) P<0.001 | | | l.s.d (P<0.05) = | 0.259 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 9.4 | 10.2 | 10.8 | 11.4 | 10.5 |
| **Trojan** | 10.7 | 10.1 | 11.2 | 11.9 | 11.0 |
| ***Means*** | 10.0 | 10.2 | 11.0 | 11.7 |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.003 | | | l.s.d (P<0.05) = | 0.84 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 82.3 | 80.6 | 80.6 | 78.9 | 80.6 |
| **Trojan** | 79.8 | 80.9 | 80.8 | 79.8 | 80.3 |
| ***Means*** | 81.1 | 80.8 | 80.7 | 79.3 |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1.63 | 2.35 | 2.17 | 2.55 | *2.18* |
| **Trojan** | 3.65 | 2.84 | 3.56 | 4.63 | *3.67* |
| ***Means*** | 2.64 | 2.59 | 2.87 | 3.59 |  |
|  | Significance (Variety) P= 0.043 | | | l.s.d (P<0.05) = | 1.446 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

***BARLEY***

Table 153: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 113 | 128 | 123 | 122 | *121* |
| **Bass** | 108 | 119 | 113 | 111 | *113* |
| ***Means*** | *111* | *123* | *118* | *116* |  |
|  | Significance (Variety) P=0.011 | | | l.s.d (P<0.05) = | 6.3 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 154: Crop emergence (0-9) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 7.7 | 8.7 | 8.8 | 8.7 | *8.5* |
| **Bass** | 8.3 | 9.0 | 8.7 | 8.8 | *8.7* |
| ***Means*** | *8.0* | *8.8* | *8.7* | *8.8* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 155: Crop vigour (0-9) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 8.0 | 9.0 | 8.4 | 8.0 | *8.3* |
| **Bass** | 8.0 | 8.3 | 8.3 | 8.4 | *8.3* |
| ***Means*** | *8.0* | *8.7* | *8.3* | *8.2* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 156: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 1 | 1 | 2 | 2 | *1* |
| **Bass** | 3 | 4 | 3 | 3 | *3* |
| ***Means*** | *2* | *2* | *2* | *2* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.3 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 157: NDVI reading barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 0.49 | 0.61 | 0.65 | 0.64 | *0.60* |
| **Bass** | 0.67 | 0.73 | 0.72 | 0.75 | *0.72* |
| ***Means*** | *0.58* | *0.67* | *0.68* | *0.69* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.034 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.048 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 250 | 248 | 248 | 249 | *249* |
| **Bass** | 267 | 265 | 266 | 266 | *266* |
| ***Means*** | *258* | *257* | *257* | *257* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.7 |
|  | Significance (Decile) P=0.02 | | | l.s.d (P<0.05) = | 1.0 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** |
| **LaTrobe** | 2.0 | 2.8 | 4.2 | 3.2 |
| **Bass** | 2.6 | 3.1 | 1.6 | 4.2 |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 3.26 | 4.14 | 3.93 | 4.04 | *3.84* |
| **Bass** | 3.06 | 3.54 | 3.43 | 3.52 | *3.39* |
| ***Means*** | *3.16* | *3.84* | *3.68* | *3.78* |  |
|  | Significance (Variety) P <0.001 | | | l.s.d (P<0.05) = | 0.184 |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.261 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 9: Protein (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 9.5 | 9.8 | 10.8 | 11.7 | *10.5* |
| **Bass** | 10.1 | 10.4 | 11.2 | 11.4 | *10.8* |
| ***Means*** | *9.8* | *10.1* | *11.0* | *11.5* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.46 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 10: Colour (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 65.8 | 66.0 | 66.6 | 65.4 | *65.9* |
| **Bass** | 65.5 | 65.1 | 64.1 | 64.4 | *64.8* |
| ***Means*** | *65.6* | *65.6* | *65.3* | *64.9* |  |
|  | Significance (Variety) P=0.003 | | | l.s.d (P<0.05) = | 0.69 |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 70.3 | 69.5 | 66.9 | 66.4 | *68.3* |
| **Bass** | 66.8 | 66.2 | 66.7 | 66.3 | *66.5* |
| ***Means*** | *68.5* | *67.9* | *66.8* | *66.3* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 12: <2.2 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 3.6 | 7.6 | 16.4 | 16.1 | *10.9* |
| **Bass** | 4.0 | 4.6 | 9.4 | 6.1 | *6.0* |
| ***Means*** | *3.8* | *6.1* | *12.9* | *11.1* |  |
|  | Significance (Variety) P=0.04 | | | l.s.d (P<0.05) = | 4.58 |
|  | Significance (Decile) P=0.03 | | | l.s.d (P<0.05) = | 6.47 |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 13: 2.2-2.5 screenings (%) barley

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **LaTrobe** | 16.6 | 26.6 | 29.3 | 31.1 | *25.9* |
| **Bass** | 24.3 | 23.1 | 26.5 | 33.7 | *26.9* |
| ***Means*** | *20.4* | *24.8* | *27.9* | *32.4* |  |
|  | Significance (Variety) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | l.s.d (P<0.05) = | n.a |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | | ***Means*** |
| **LaTrobe** | 79.8 | 65.8 | 54.4 | | 52.8 | | *63.2* |
| **Bass** | 71.6 | 72.3 | 64.1 | | 60.1 | | *67.1* |
| ***Means*** | *75.2* | *69.1* | *59.2* | | *56.4* | |  |
|  | Significance (Variety) P=NS | | |  | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=0.02 | | | | | l.s.d (P<0.05) = | 12.91 |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

*CANOLA*

Table 158: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 38 | 37 | 37 | 34 | *37* |
| **InVigor T4510** | 37 | 40 | 37 | 37 | *38* |
| ***Means*** | *37* | *39* | *37* | *36* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 159: Crop emergence (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 8.0 | 8.0 | 8.0 | 7.7 | *7.9* |
| **InVigor T4510** | 8.3 | 9 | 7.7 | 7 | *8.0* |
| ***Means*** | *8.2* | *8.5* | *7.8* | *7.3* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.5 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 160: Crop vigour (0-9) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 7.7 | 9.0 | 8.3 | 9.0 | *8.5* |
| **InVigor T4510** | 7.3 | 9.0 | 8.7 | 8.0 | *8.3* |
| ***Means*** | *7.5* | *9.0* | *8.5* | *8.5* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.008 | | | l.s.d (P<0.05) = | 0.8 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 161: NDVI reading canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 0.57 | 0.63 | 0.66 | 0.71 | *0.64* |
| **InVigor T4510** | 0.56 | 0.59 | 0.68 | 0.71 | *0.64* |
| ***Means*** | *0.57* | *0.61* | *0.67* | *0.71* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.042 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 162: Days to 50% flowering canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 231 | 228 | 228 | 229 | *229* |
| **InVigor T4510** | 229 | 228 | 228 | 229 | *229* |
| ***Means*** | *230* | *228* | *228* | *229* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 1.0 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 163: Yield (t/ha) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 1.16 | 1.29 | 1.36 | 1.50 | *1.33* |
| **InVigor T4510** | 1.08 | 1.38 | 1.36 | 1.46 | *1.32* |
| ***Means*** | *1.12* | *1.33* | *1.36* | *1.48* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P <0.001 | | | l.s.d (P<0.05) = | 0.096 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Protein (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 23.1 | 24.2 | 23 | 22.3 | *23.2* |
| **InVigor T4510** | 21.6 | 21.5 | 23 | 22.2 | *22.1* |
| ***Means*** | *22.3* | *22.9* | *23* | *22.2* |  |
|  | Significance (Variety) P= 0.01 | | | l.s.d (P<0.05) = | 0.85 |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 8: Oil (%) canola

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Hyola 559** | 43.7 | 43.0 | 43.9 | 43.6 | *43.5* |
| **InVigor T4510** | 45.0 | 43.9 | 43.6 | 43.7 | *44.1* |
| ***Means*** | *44.3* | *43.4* | *43.8* | *43.7* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | n,a |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

## Location 8: York

***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | York NVT | **Sowing Date:** | 31/05/2018 |
| **Varieties:** | |  | | --- | | Scepter and Trojan | | **Harvest Date:** | 10/12/2018 |
| **Previous Crop:** | Canola |  |  |

***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** | York NVT | **Sowing Date:** | 31/05/2018 |
| **Varieties:** | |  | | --- | | La Trobe & Bass | | **Harvest Date:** | 10/12/2018 |
| **Previous Crop:** | Canola |  |  |

***Canola:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specific Location:** | Yealering NVT | **Sowing Date:** | | 12/05/2018 |
| **Varieties:** | |  | | --- | | Hyola 559 &  InVigor T4510 | | **Harvest Date:** | | 12/11/2018 |
| **Previous Crop:** | Lupin |  | |  |
|  |  |  | |  |
| |  | | --- | | ***Weather Conditions*** | | | |  | | |
|  | | |  | | |
| |  |  | | --- | --- | | ***Event*** | ***Comments*** | | ***Frost Event*** | This trial experienced frost conditions on the following dates throughout the flowering period: -0.3 °C on Aug 5, -0.6 °C on Aug 10, -0.8 °C on Aug 11, -0.1 °C on Aug 23, -0.7 °C on Sep 6, -0.4 °C on Sep 12, -2.7 °C on Sep 15, -2.1 °C on Sep 16. Interpret results with caution. | | ***Heat Event*** | This trial experienced extreme heat conditions on the following dates throughout the flowering period: 33.3 °C on Sep 3, 32.8 °C on Sep 21, 33.2 °C on Sep 22, 33.6 °C on Sep 23, 34.2 °C on Sep 30, 32.1 °C on Oct 10, 34.6 °C on Oct 11, 34.2 °C on Oct 16, 38.2 °C on Oct 17, 33 °C on Oct 23, 32.2°C on Oct 24, 36.3 °C on Oct 25, 35.8 °C on Oct 26, 34.2 °C on Oct 27, 37.8 °C on Oct 28, 39.5 °Con Oct 29, 33.4 °C on Oct 30. Interpret results with caution. | | | | | | | |

***Rainfall (mm) Data Source: DPIRD weather station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 91.8 | 27.2 | 0.2 | 11.4 | 0.4 | 51.2 | 111.8 | 86.4 | 7 | 38 | 1 | 0.4 |

***Soil Testing***

|  |  |
| --- | --- |
| ***Soil Classification Details*** | |
| ***Order*** | Chromosols  Chromosols: soils with a strong texture contrast between the topsoil and subsoil. Subsoils are not strongly acid and are not sodic |
| ***Sub-Order*** | Grey |
| ***Identification Source*** | CSIRO SoilMapp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Depth*** | ***Texture*** | ***Total Nitrogen*** | ***Phosphorous*** | ***P Test Type*** |
| *cm* | *1 sand, 2 sandy loam, 3 loam, 4 loamy clay, 5 clay* | *mg/kg* | *mg/kg* |  |
|  | ***16/03/2018*** | 0-10 | 1.0 | 17.0 | 59.00 | Colwell |
|  | ***16/03/2018*** | 10-60 | 1.5 | 6.0 | 59.00 | Colwell |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | ***Organic Carbon*** | ***pH (water)*** | ***pH (CaCl2)*** | ***Conductivity (EC)*** | ***ESP*** |
| *%* | *pH* | *pH* | *dS/m* | *%* |
|  | ***15/03/2018*** | 1.1 | 7.10 | 6.60 | 0.2 | Na |
|  | ***15/03/2018*** | 0.8 | 6.10 | 5.60 | 0.1 | 2.9 |

***Fertiliser Treatments***

|  |  |  |  |
| --- | --- | --- | --- |
|  | **N (Pre)** | **N (Post)** | **P** |
| **Decile 0** | 0 | 0 | 0 |
| **Decile 3** | 10 | 0 | 5 |
| **Decile 6** | 30 | 0 | 5 |
| **Play Season** | 30 | 20 | 5 |

**Post emergent applications**

* Cereals applied 20/07/2018
* Canola applied 13/07/2018

***Results***

***WHEAT***

Table 164: Crop Establishment (plants/m2) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 127 | 124 | 120 | 124 | 124 |
| **Trojan** | 117 | 120 | 118 | 118 | 118 |
| ***Means*** | 122 | 122 | 119 | 121 |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | |

Table 165: Crop emergence (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8.3 | 8.7 | 8.3 | 9.0 | *8.6* |
| **Trojan** | 8.7 | 9 | 8.7 | 8.0 | *8.6* |
| ***Means*** | 8.5 | 8.8 | *8.5* | *8.5* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

Table 166: Crop vigour (0-9) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 8 | 8.3 | 8.7 | 8.7 | *8.3* |
| **Trojan** | 8 | 8.7 | *8.3* | 7.7 | *8.2* |
| ***Means*** | *8* | *8.5* | *8.5* | *7.8* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = | N.A |
|  | Significance (Decile) P= NS | | | l.s.d (P<0.05) = | N.A |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | N.A |

Table 167: Tiller count (number of tillers per main stem) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 1 | 1 | 1 | 1 | *1* |
| **Trojan** | 1 | 1 | 1 | 1 | *1* |
| ***Means*** | *1* | *1* | *1* | *1* |  |
|  | Significance (Variety) P= NS | | | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Decile) P= NS | |  | l.s.d (P<0.05) = n.a. | | |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = n.a. | | |

Table 168: NDVI reading wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | 0.43 | 0.52 | 0.59 | 0.62 | *0.54* |
| **Trojan** | 0.42 | 0.42 | 0.52 | 0.50 | *0.47* |
| ***Means*** | 0.43 | 0.48 | 0.56 | 0.56 |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 0.036 |
|  | Significance (Decile) P= <0.001 | | | l.s.d (P<0.05) = | 0.051 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) wheat

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | **Play Season** | ***Means*** |
| **Scepter** | *270* | 266 | 266 | 266 | *267* |
| **Trojan** | 278 | 274 | 276 | 273 | *275* |
| ***Means*** | *274* | *270* | *271* | *270* |  |
|  | Significance (Variety) P= <0.001 | | | l.s.d (P<0.05) = | 2.0 |
|  | Significance (Decile) P= | | 0.025 | l.s.d (P<0.05) = | 2.8 |
|  | Significance (Variety\*Decile) P= NS | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 | Decile 6 | Play Season |
| Scepter | 4.4 | 1.6 | 4.6 | 4.0 |
| Trojan | 7.9 | 6.0 | 6.8 | 4.3 |

Table 8: Yield (t/ha) wheat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | **Means** |
| Scepter | 2.45 | 3.13 | 3.54 | | 3.76 | 3.22 |
| Trojan | 2.06 | 2.46 | 2.50 | | 3.26 | 2.57 |
| Means | 2.26 | 2.80 | 3.02 | | 3.51 |  |
|  | Significance (Variety) P<0.001 | | |  | l.s.d (P<0.05) = 0.257 | |
|  | Significance (Decile) P<0.001 | | |  | l.s.d (P<0.05) = 0.364 | |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = n.a. | |

Table 9: Protein (%) wheat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Decile 0** | **Decile 3** | **Decile 6** | | **Play Season** | **Means** |
| Scepter | 7.3 | 7.9 | 7.4 | | 7.8 | 7.6 |
| Trojan | 8.3 | 8.1 | 8.1 | | 8.1 | 8.1 |
| Means | 7.8 | 8.0 | 7.8 | | 7.9 |  |
|  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = n.a. | |

Table 10: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 | Decile 6 | | Play Season | Means |
| Scepter | 79.7 | 79.8 | 81.4 | | 79.2 | 80.1 |
| Trojan | 79.5 | 81.8 | 81.8 | | 82.0 | 81.3 |
| Means | 79.6 | 80.8 | 81.6 | | 80.6 |  |
|  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = n.a. | |

Table 11: Screenings (%) wheat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Scepter | 4.8 | 6.0 |  | 4.3 | 5.5 | 5.2 |
| Trojan | 6.9 | 4.8 |  | 5.7 | 5.2 | 5.7 |
| Means | 5.8 | 5.4 |  | 5.0 | 5.4 |  |
|  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = n.a. | |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = n.a. | |

***BARLEY***

Table 6: Crop Establishment (plants/m2) barley

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 |  | Decile 3 |  | Decile 6 | | Play Season | Means |
| LaTrobe |  | 103 |  | 98 |  | 95 | | 91 | 97 |
| Bass |  | 99 |  | 96 |  | 97 | | 98 | 97 |
| Means |  | 100 |  | 97 |  | 96 | | 94 |  |
|  | Significance (Variety) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | | | l.s.d (P<0.05) = | n.a |

Table 169: Crop emergence (0-9) barley

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 |  | Decile 3 |  | Decile 6 | | Play Season | Means |
| LaTrobe |  | 8.3 |  | 8.3 |  | 8.0 | | 8.3 | 8.2 |
| Bass |  | 8.7 |  | 8.7 |  | 9.0 | | 8.5 | 8.7 |
| Means |  | 8.5 |  | 8.5 |  | 8.5 | | 8.4 |  |
|  | Significance (Variety) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | | | l.s.d (P<0.05) = | n.a |

Table 170: Crop vigour (0-9) barley

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 |  | Decile 3 |  | Decile 6 | | Play Season | Means |
| LaTrobe |  | 8.3 |  | 8.7 |  | 8.6 | | 7.7 | 8.3 |
| Bass |  | 8.0 |  | 7.7 |  | 8.7 | | 8.1 | 8.1 |
| Means |  | 8.2 |  | 8.2 |  | 8.6 | | 7.9 |  |
|  | Significance (Variety) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | | | l.s.d (P<0.05) = | n.a |

Table 171: Tiller count (number of tillers per main stem) barley

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 |  | Decile 3 |  | Decile 6 | | Play Season | Means |
| LaTrobe |  | 1 |  | 2 |  | 2 | | 2 | 2 |
| Bass |  | 3 |  | 3 |  | 3 | | 3 | 3 |
| Means |  | 2 |  | 3 |  | 3 | | 3 |  |
|  | Significance (Variety) P <0.001 | | | | |  |  | l.s.d (P<0.05) = | 0.4 |
|  | Significance (Decile) P= 0.02 | | | | |  |  | l.s.d (P<0.05) = | 0.6 |
|  | Significance (Variety\*Decile) P= | | | | |  |  | l.s.d (P<0.05) = | n.a |

Table 172: NDVI reading barley

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 |  | Decile 3 |  | Decile 6 | | Play Season | Means |
| LaTrobe |  | 0.47 |  | 0.52 |  | 0.52 | | 0.65 | 0.54 |
| Bass |  | 0.48 |  | 0.53 |  | 0.59 | | 0.61 | 0.55 |
| Means |  | 0.47 |  | 0.53 |  | 0.56 | | 0.63 |  |
|  | Significance (Variety) P=NS | | | | |  |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= 0.005 | | | | |  |  | l.s.d (P<0.05) = | 0.074 |
|  | Significance (Variety\*Decile) P=NS | | | | | | | l.s.d (P<0.05) = | n.a |

Table 6: Days to Z61 (start of flowering) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 |  | Decile 3 |  | Decile 6 | Play Season | Means |
| LaTrobe | 257 |  | 254 |  | 254 | 253 | 254 |
| Bass | 268 |  | 266 |  | 267 | 266 | 267 |
| Means | 263 |  | 260 |  | 260 | 259 |  |
|  | Significance (Variety) P <0.001 | | | |  | l.s.d (P<0.05) = | 1.7 |
|  | Significance (Decile) P= 0.0499 | | | |  | l.s.d (P<0.05) = | 2.4 |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

Table 7: Floret Sterility (%) barley

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | |
| LaTrobe | 5.0 | 4.4 |  | 4.1 | 4.5 |  |
| Bass | 3.2 | 5.7 |  | 3.3 | 3.9 |  |

Table 8: Yield (t/ha) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season |  | Means |
| LaTrobe | 2.55 | 3.13 |  | 3.26 | 3.83 |  | 3.19 |
| Bass | 2.36 | 2.91 |  | 3.60 | 3.43 |  | 3.07 |
| Means | 2.45 | 3.02 |  | 3.43 | 3.63 |  |  |
|  | Significance (Variety) P=NS | | |  | l.s.d (P<0.05) = | | n.a |
|  | Significance (Decile) P <0.001 | | |  | l.s.d (P<0.05) = | | 0.4 |
|  | Significance (Variety\*Decile) P=NS | | | | l.s.d (P<0.05) = | | n.a |

Table 9: Protein (%) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season |  | Means |
| LaTrobe | 7.8 | 7.9 |  | 8.5 | 9.8 |  | 8.5 |
| Bass | 8.9 | 9.0 |  | 9.5 | 9.1 |  | 9.1 |
| Means | 8.4 | 8.5 |  | 9.0 | 9.5 |  |  |
|  | Significance (Variety) P= 0.049 | | |  | l.s.d (P<0.05) = | | 0.61 |
|  | Significance (Decile) P=NS | | |  | l.s.d (P<0.05) = | | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | l.s.d (P<0.05) = | | n.a |

Table 10: Colour (%) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season |  | Means |
| LaTrobe | 64.0 | 63.5 |  | 63.1 | 65.0 |  | 63.9 |
| Bass | 66.2 | 63.6 |  | 62.9 | 63.0 |  | 63.9 |
| Means | 65.1 | 63.6 |  | 63.0 | 64.0 |  |  |
|  | Significance (Variety) P=NS | | |  | l.s.d (P<0.05) = | | n.a |
|  | Significance (Decile) P=NS | | |  | l.s.d (P<0.05) = | | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | l.s.d (P<0.05) = | | n.a |

Table 11: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 |  | Decile 3 |  | Decile 6 | Play Season | Means |  |
| LaTrobe | 69.1 |  | 70.0 |  | 68.8 | 68.1 | 69.0 |  |
| Bass | 65.5 |  | 67.0 |  | 68.4 | 65.9 | 66.7 |  |
| Means | 67.3 |  | 68.5 |  | 68.6 | 67.0 |  |  |
|  | Significance (Variety) P <0.001 | | | |  | l.s.d (P<0.05) = | 1.11 |  |
|  | Significance (Decile) P=NS | | | |  | l.s.d (P<0.05) = | n.a | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a | |

Table 12: <2.2 screenings (%) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 |  | Decile 3 |  | Decile 6 | Play Season | Means |  |
| LaTrobe | 5.0 |  | 4.2 |  | 6.1 | 8.0 | 5.8 |  |
| Bass | 3.1 |  | 2.7 |  | 2.3 | 3.3 | 2.8 |  |
| Means | 4.1 |  | 3.4 |  | 4.2 | 5.7 |  |  |
|  | Significance (Variety) P=0.002 | | | |  | l.s.d (P<0.05) = | 1.63 |  |
|  | Significance (Decile) P=NS | | | |  | l.s.d (P<0.05) = | n.a | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a | |

Table 13: 2.2-2.5 screenings (%) barley

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 |  | Decile 3 |  | Decile 6 | Play Season | Means |  |
| LaTrobe | 15.6 |  | 14.6 |  | 15.3 | 27.3 | 18.2 |  |
| Bass | 15.3 |  | 15.1 |  | 11.8 | 15.2 | 14.3 |  |
| Means | 15.5 |  | 14.9 |  | 13.5 | 21.3 |  |  |
|  | Significance (Variety) P=NS | | | |  | l.s.d (P<0.05) = | n.a | |
|  | Significance (Decile) P=NS | | | |  | l.s.d (P<0.05) = | n.a | |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a | |

Table 14: Plump grain (%) barley

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 |  | Decile 3 |  | Decile 6 | Play Season | Means |
| LaTrobe | 79.3 |  | 81.2 |  | 78.6 | 64.7 | 76.0 |
| Bass | 81.6 |  | 82.2 |  | 85.9 | 81.5 | 82.8 |
| Means | 80.5 |  | 81.7 |  | 82.3 | 73.1 |  |
|  | Significance (Variety) P=NS | | | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P=NS | | | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P=NS | | | | | l.s.d (P<0.05) = | n.a |

*CANOLA*

Table 173: Crop Establishment (plants/m2) canola

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 |  | 47 | 54 |  | 41 | 49 | 48 |
| InVigor T4510 |  | 46 | 43 |  | 44 | 44 | 44 |
| Means |  | 46 | 49 |  | 43 | 47 |  |
|  |  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 174: Crop emergence (0-9) canola

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 |  | 9.0 | 9.0 |  | 8.7 | 9.0 | 8.9 |
| InVigor T4510 |  | 8.7 | 9.0 |  | 9.0 | 8.7 | 8.8 |
| Means |  | 8.8 | 9.0 |  | 8.8 | 8.8 |  |
|  |  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 175: Crop vigour (0-9) canola

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 |  | 8.0 | 8.7 |  | 8.3 | 9.0 | 8.5 |
| InVigor T4510 |  | 6.7 | 8.0 |  | 8.0 | 8.7 | 7.8 |
| Means |  | 7.3 | 8.3 |  | 8.2 | 8.8 |  |
|  |  | Significance (Variety) P= 0.004 | | |  | l.s.d (P<0.05) = | 0.4 |
|  |  | Significance (Decile) P <0.001 | | |  | l.s.d (P<0.05) = | 0.6 |
|  |  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 176: NDVI reading canola

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 |  | 0.74 | 0.73 |  | 0.72 | 0.75 | 0.74 |
| InVigor T4510 |  | 0.72 | 0.73 |  | 0.70 | 0.73 | 0.72 |
| Means |  | 0.73 | 0.73 |  | 0.71 | 0.74 |  |
|  |  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 177: Days to 50% flowering canola

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 |  | 227 | 226 |  | 228 | 228 | 227 |
| InVigor T4510 |  | 228 | 228 |  | 228 | 228 | 228 |
| Means |  | 228 | 227 |  | 228 | 228 |  |
|  |  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  |  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 178: Yield (t/ha) canola

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 | 1.78 | 1.89 |  | 2.03 | 2.25 | 1.99 |
| InVigor T4510 | 1.45 | 1.74 |  | 2.10 | 2.07 | 1.84 |
| Means | 1.62 | 1.81 |  | 2.07 | 2.16 |  |
|  | Significance (Variety) P= 0.017 | | |  | l.s.d (P<0.05) = | 0.117 |
|  | Significance (Decile) P <0.01 | | |  | l.s.d (P<0.05) = | 0.165 |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 7: Protein (%) canola

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 | 22.0 | 21.4 |  | 22.0 | 22.5 | 22.0 |
| InVigor T4510 | 21.0 | 20.5 |  | 21.4 | 21.6 | 21.1 |
| Means | 21.5 | 21.0 |  | 21.7 | 22.1 |  |
|  | Significance (Variety) P= 0.003 | | |  | l.s.d (P<0.05) = | 0.5 |
|  | Significance (Decile) P= 0.03 | | |  | l.s.d (P<0.05) = | 0.71 |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

Table 8: Oil (%) canola

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Decile 0 | Decile 3 |  | Decile 6 | Play Season | Means |
| Hyola 559 | 46.9 | 47.3 |  | 46.9 | 46.4 | 46.9 |
| InVigor T4510 | 46.6 | 47.0 |  | 46.2 | 45.9 | 46.4 |
| Means | 46.8 | 47.2 |  | 46.6 | 46.2 |  |
|  | Significance (Variety) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Decile) P= NS | | |  | l.s.d (P<0.05) = | n.a |
|  | Significance (Variety\*Decile) P= NS | | | | l.s.d (P<0.05) = | n.a |

**Appendix 2 B 2019 Data**

## Location 1: Corrigin

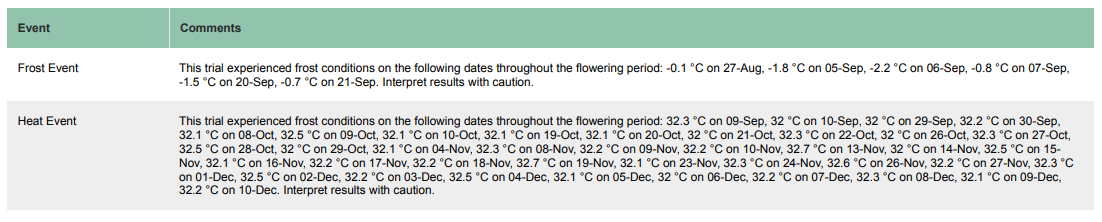
***Wheat:***

|  |  |  |
| --- | --- | --- |
| **Specific Location:** Corrigin |  | **Sowing Date:** 7 June 2019 |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 8 December 2019 |
| **Previous Crop:** Canola |  |  |

***Barley:***

|  |  |  |
| --- | --- | --- |
| **Specific Location:** Corrigin |  | **Sowing Date:** 7 June 2019 |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 8 December 2019 |
| **Previous Crop:** Canola |  |  |

***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Jan*** | ***Feb*** | ***Mar*** | ***Apr*** | ***May*** | ***Jun*** | ***Jul*** | ***Aug*** | ***Sep*** | ***Oct*** | ***Nov*** | ***Dec*** |
| 0 | 0 | 8.6 | 25.4 | 6.4 | 85.9 | 49.8 | 71.8 | 9.2 | 16.2 | 5.2 | 0 |

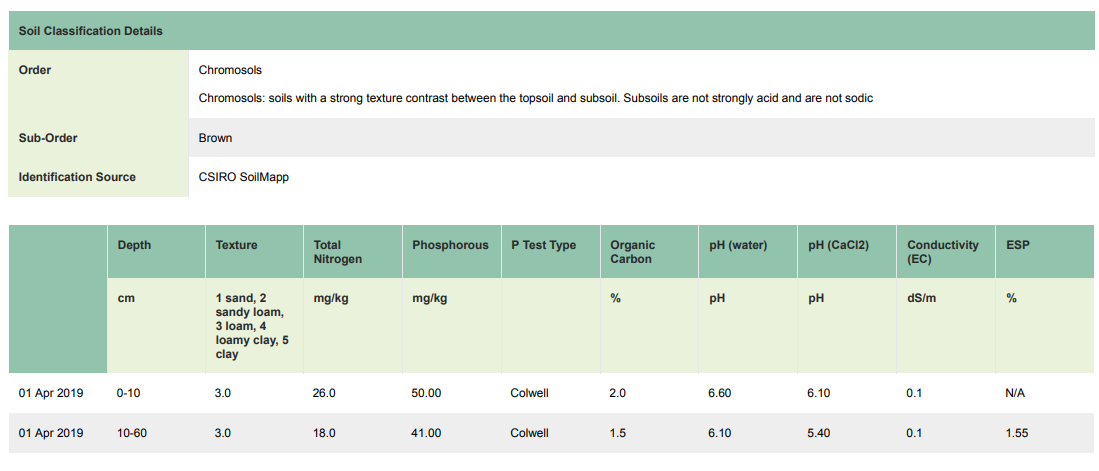
***Soil Testing***

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.7 | 8.3 | 8.3 | *8.4* |
| **Trojan** | 8.3 | 8.3 | 8.3 | *8.3* |
| **Devil** | 7.7 | 8.0 | 8.3 | *8.0* |
| **Ninja** | 8.7 | 8.7 | 8.7 | *8.7* |
| ***Means*** | *8.3* | *8.3* | *8.4* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 9.0 | 8.0 | 9.0 | *8.7* |
| **Trojan** | 8.3 | 8.7 | 8.0 | *8.3* |
| **Devil** | 7.3 | 8.3 | 7.3 | *7.7* |
| **Ninja** | 8.0 | 8.3 | 8.3 | *8.2* |
| ***Means*** | *8.2* | *8.3* | *8.2* |  |
|  | Significance (Variety) P = 0.013 | | l.s.d (P<0.05) = 0.6 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.42 | 0.37 | 0.41 | *0.40* |
| **Trojan** | 0.44 | 0.46 | 0.43 | *0.44* |
| **Devil** | 0.44 | 0.45 | 0.49 | *0.46* |
| **Ninja** | 0.43 | 0.46 | 0.50 | *0.46* |
| ***Means*** | *0.43* | *0.44* | *0.46* |  |
|  | Significance (Variety) P = 0.024 | | l.s.d (P<0.05) = 0.042 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 9 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.51 | 0.58 | 0.57 | *0.55* |
| **Trojan** | 0.40 | 0.56 | 0.53 | *0.50* |
| **Devil** | 0.42 | 0.62 | 0.61 | *0.55* |
| **Ninja** | 0.44 | 0.60 | 0.69 | *0.57* |
| ***Means*** | *0.44* | *0.59* | *0.60* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.053 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 1.92 | 2.14 | 2.25 | *2.10* |
| **Trojan** | 1.65 | 2.16 | 2.13 | *1.98* |
| **Devil** | 1.93 | 2.34 | 2.35 | *2.21* |
| **Ninja** | 1.68 | 2.07 | 2.17 | *1.97* |
| ***Means*** | *1.80* | *2.18* | *2.22* |  |
|  | Significance (Variety) P = 0.014 | | l.s.d (P<0.05) = 0.156 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.135 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.3 | 9.1 | 9.4 | *8.9* |
| **Trojan** | 7.9 | 9.2 | 9.7 | *8.9* |
| **Devil** | 7.5 | 9.2 | 9.5 | *8.7* |
| **Ninja** | 7.8 | 8.9 | 9.8 | *8.8* |
| ***Means*** | *7.9* | *9.1* | *9.6* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.53 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 80.1 | 80.2 | 81.0 | *80.4* |
| **Trojan** | 83.3 | 82.7 | 83.2 | *83.1* |
| **Devil** | 78.5 | 77.5 | 78.6 | *78.2* |
| **Ninja** | 78.3 | 79.4 | 77.9 | *78.5* |
| ***Means*** | *80.0* | *80.0* | *80.2* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.07 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 4.1 | 4.9 | 4.5 | *4.5* |
| **Trojan** | 3.5 | 4.4 | 3.7 | *3.9* |
| **Devil** | 3.2 | 5.4 | 5.3 | *4.6* |
| **Ninja** | 4.1 | 4.9 | 6.3 | *5.1* |
| ***Means*** | *3.7* | *4.9* | *5.0* |  |
|  | Significance (Variety) P N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= 0.036 | | l.s.d (P<0.05) = 1.03 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.3 | 9.0 | 8.0 | 8.4 |
| **Buff** | 8.7 | 8.3 | 8.3 | 8.4 |
| **Spartacus** | 8.3 | 8.3 | 8.3 | 8.3 |
| **Planet** | 8.3 | 8.7 | 8.7 | 8.6 |
| ***Means*** | 8.4 | 8.6 | 8.3 |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.7 | 8.0 | 7.3 | 8.0 |
| **Buff** | 8.7 | 8.7 | 8.0 | 8.4 |
| **Spartacus** | 7.3 | 7.3 | 7.3 | 7.3 |
| **Planet** | 8.3 | 9.0 | 8.7 | 8.7 |
| ***Means*** | 8.3 | 8.3 | 7.8 |  |
|  | Significance (Variety) P = 0.0003 | | l.s.d (P<0.05) = 0.6 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.33 | 0.44 | 0.42 | 0.40 |
| **Buff** | 0.47 | 0.46 | 0.41 | 0.45 |
| **Spartacus** | 0.46 | 0.41 | 0.40 | 0.43 |
| **Planet** | 0.43 | 0.45 | 0.45 | 0.44 |
| ***Means*** | 0.43 | 0.44 | 0.42 |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 9 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.55 | 0.62 | 0.66 | 0.61 |
| **Buff** | 0.55 | 0.64 | 0.64 | 0.61 |
| **Spartacus** | 0.54 | 0.59 | 0.60 | 0.58 |
| **Planet** | 0.57 | 0.66 | 0.71 | 0.65 |
| ***Means*** | 0.55 | 0.63 | 0.65 |  |
|  | Significance (Variety) P = 0.015 | | l.s.d (P<0.05) = 0.04 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.03 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 2.72 | 2.91 | 2.93 | 2.85 |
| **Buff** | 2.19 | 2.35 | 2.49 | 2.34 |
| **Spartacus** | 2.40 | 2.73 | 2.86 | 2.66 |
| **Planet** | 2.01 | 2.19 | 2.35 | 2.19 |
| ***Means*** | 2.33 | 2.54 | 2.66 |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.148 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.128 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.5 | 8.4 | 8.4 | 8.4 |
| **Buff** | 8.3 | 8.2 | 8.1 | 8.2 |
| **Spartacus** | 8.5 | 8.3 | 8.3 | 8.4 |
| **Planet** | 8.5 | 8.4 | 8.4 | 8.4 |
| ***Means*** | 8.5 | 8.3 | 8.3 |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.07 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.06 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 65.1 | 64.7 | 64.5 | 64.8 |
| **Buff** | 67.3 | 66.0 | 66.0 | 66.5 |
| **Spartacus** | 66.9 | 66.7 | 66.5 | 66.7 |
| **Planet** | 65.8 | 64.4 | 64.2 | 64.8 |
| ***Means*** | 66.3 | 65.5 | 65.3 |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.26 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.23 | |
|  | Significance (Variety \* Decile) P = 0.002 | | l.s.d (P<0.05) = 0.45 | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 65.5 | 62.0 | 62.1 | 63.2 |
| **Buff** | 59.4 | 56.5 | 56.2 | 57.4 |
| **Spartacus** | 67.1 | 63.9 | 63.4 | 64.8 |
| **Planet** | 58.2 | 56.2 | 56.5 | 57.0 |
| ***Means*** | 62.5 | 59.7 | 59.6 |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.83 | |
|  | Significance (Decile) P= 0.0009 | | l.s.d (P<0.05) = 1.58 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 36.4 | 63.7 | 63.3 | 54.5 |
| **Buff** | 48.9 | 65.4 | 66.5 | 60.3 |
| **Spartacus** | 28.6 | 60.0 | 64.7 | 51.1 |
| **Planet** | 53.0 | 68.5 | 66.6 | 62.7 |
| ***Means*** | 41.7 | 64.4 | 65.3 |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 8.32 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 10: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 63.6 | 36.3 | 36.7 | 45.5 |
| **Buff** | 51.1 | 34.6 | 33.5 | 39.7 |
| **Spartacus** | 71.4 | 40.0 | 35.3 | 48.9 |
| **Planet** | 47.0 | 31.5 | 33.4 | 37.3 |
| ***Means*** | 58.3 | 35.6 | 34.7 |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P<0.001 | | l.s.d (P<0.05) = 8.32 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

## Location 2: Cunderdin

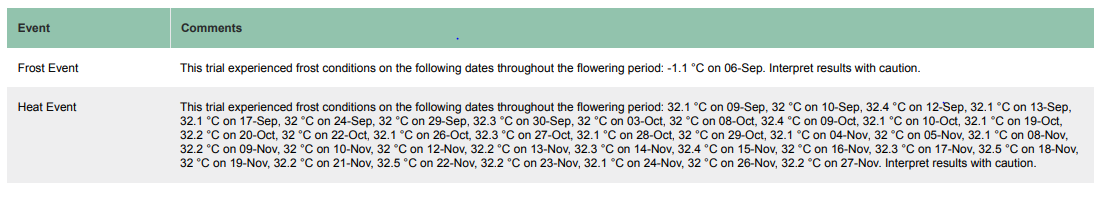
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Cunderdin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 22 November 2019 |  |
| **Previous Crop:** Lupin |  |  |  |

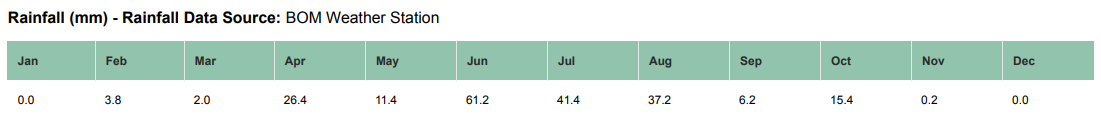
***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Cunderdin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 22 November 2019 |  |
| **Previous Crop:** Lupin |  |  |  |

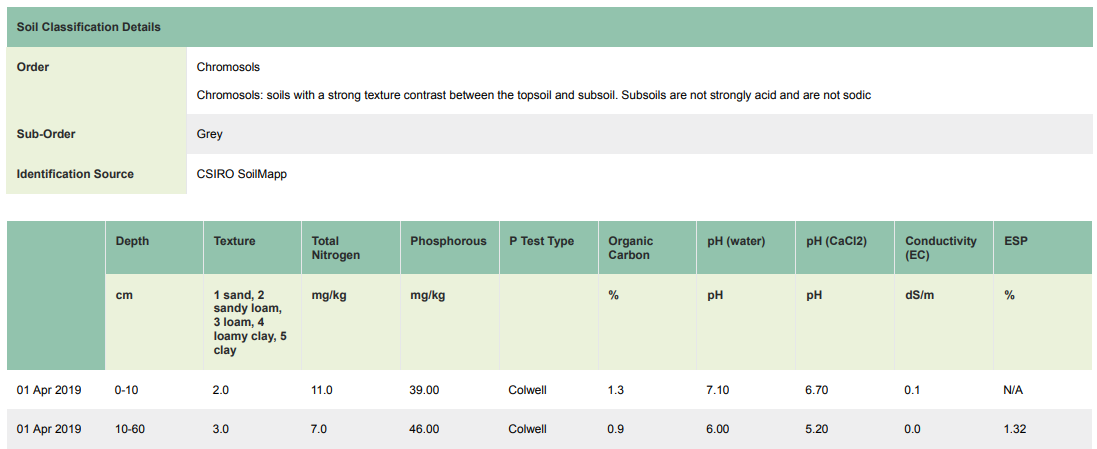
***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***



***Soil Testing***



***Fertiliser Treatments***

Due to an in-season error, the entire yardstick trial received 100 L/ha of UAN applied post emergent. This adjusted the deciles used at the site. The Cunderdin site now evaluated Decile 4, 7 and 9, rather than the initial 1, 4 and 7 used across the remaining sites.

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 4** | 52 | 0 |
| **Decile 7** | 52 | 54 |
| **Decile 9** | 52 | 67 |

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 8.0 | 8.0 | 9.0 | *8.3* |
| **Trojan** | 8.0 | 8.0 | 8.0 | *8.0* |
| **Devil** | 8.7 | 8.3 | 8.3 | *8.4* |
| **Ninja** | 9.0 | 8.5 | 9.0 | *8.8* |
| ***Means*** | *8.4* | *8.2* | *8.6* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 8.7 | 8.7 | 9.0 | *8.8* |
| **Trojan** | 9.0 | 8.5 | 8.5 | *8.7* |
| **Devil** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Ninja** | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *8.9* | *8.8* | *8.9* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 0.49 | 0.46 | 0.55 | *0.50* |
| **Trojan** | 0.52 | 0.47 | 0.55 | *0.51* |
| **Devil** | 0.51 | 0.55 | 0.52 | *0.53* |
| **Ninja** | 0.55 | 0.58 | 0.60 | *0.58* |
| ***Means*** | *0.52* | *0.51* | *0.55* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 26 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 0.61 | 0.62 | 0.61 | *0.61* |
| **Trojan** | 0.59 | 0.60 | 0.59 | *0.59* |
| **Devil** | 0.61 | 0.63 | 0.62 | *0.62* |
| **Ninja** | 0.64 | 0.66 | 0.73 | *0.68* |
| ***Means*** | *0.61* | *0.62* | *0.64* |  |
|  | Significance (Variety) P = 0.010 | | l.s.d (P<0.05) = 0.055 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: NDVI reading wheat 6 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 0.60 | 0.59 | 0.62 | *0.60* |
| **Trojan** | 0.57 | 0.58 | 0.63 | *0.59* |
| **Devil** | 0.57 | 0.60 | 0.63 | *0.60* |
| **Ninja** | 0.65 | 0.64 | 0.69 | *0.66* |
| ***Means*** | *0.60* | *0.60* | *0.64* |  |
|  | Significance (Variety) P = 0.005 | | l.s.d (P<0.05) = 0.04 | |
|  | Significance (Decile) P= 0.02 | | l.s.d (P<0.05) = 0.03 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 2.15 | 2.20 | 2.23 | *2.19* |
| **Trojan** | 1.87 | 2.03 | 1.91 | *1.93* |
| **Devil** | 2.25 | 2.23 | 2.22 | *2.24* |
| **Ninja** | 2.19 | 2.29 | 1.79 | *2.09* |
| ***Means*** | *2.12* | *2.19* | *2.04* |  |
|  | Significance (Variety) P = 0.007 | | l.s.d (P<0.05) = 0.16 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 11.0 | 10.3 | 11.9 | *11.1* |
| **Trojan** | 11.2 | 11.1 | 12.6 | *11.6* |
| **Devil** | 9.9 | 11.1 | 10.7 | *10.6* |
| **Ninja** | 10.8 | 10.9 | 13.6 | *11.8* |
| ***Means*** | *10.7* | *10.9* | *12.2* |  |
|  | Significance (Variety) P = 0.027 | | l.s.d (P<0.05) = 0.80 | |
|  | Significance (Decile) P= 0.0007 | | l.s.d (P<0.05) = 0.69 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 78.9 | 79.6 | 79.7 | *79.4* |
| **Trojan** | 81.4 | 82.3 | 81.7 | *81.8* |
| **Devil** | 80.6 | 79.0 | 80.1 | *79.9* |
| **Ninja** | 80.4 | 80.7 | 75.5 | *78.9* |
| ***Means*** | *80.3* | *80.4* | *79.2* |  |
|  | Significance (Variety) P = 0.041 | | l.s.d (P<0.05) = 2.01 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 9: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Scepter** | 3.5 | 3.7 | 2.9 | *3.3* |
| **Trojan** | 2.6 | 2.5 | 4.2 | *3.1* |
| **Devil** | 2.4 | 2.9 | 2.3 | *2.6* |
| **Ninja** | 2.4 | 2.3 | 5.9 | *3.5* |
| ***Means*** | *2.7* | *2.9* | *3.8* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 8.7 | 8.3 | 8.3 | *8.4* |
| **Buff** | 7.7 | 8.7 | 8.0 | *8.1* |
| **Spartacus** | 8.0 | 8.0 | 8.3 | *8.1* |
| **Planet** | 7.7 | 8.0 | 7.3 | *7.7* |
| ***Means*** | *8.0* | *8.3* | *8.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 9.0 | 9.0 | 8.3 | *8.8* |
| **Buff** | 8.3 | 9.0 | 9.0 | *8.8* |
| **Spartacus** | 8.0 | 8.7 | 8.7 | *8.4* |
| **Planet** | 8.7 | 8.0 | 8.0 | *8.2* |
| ***Means*** | *8.5* | *8.7* | *8.5* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 0.50 | 0.47 | 0.49 | *0.48* |
| **Buff** | 0.53 | 0.56 | 0.53 | *0.54* |
| **Spartacus** | 0.51 | 0.50 | 0.47 | *0.49* |
| **Planet** | 0.53 | 0.52 | 0.54 | *0.53* |
| ***Means*** | *0.52* | *0.51* | *0.51* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 27 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 0.52 | 0.56 | 0.54 | *0.54* |
| **Buff** | 0.58 | 0.58 | 0.62 | *0.59* |
| **Spartacus** | 0.57 | 0.56 | 0.58 | *0.57* |
| **Planet** | 0.59 | 0.60 | 0.61 | *0.60* |
| ***Means*** | *0.56* | *0.58* | *0.59* |  |
|  | Significance (Variety) P = 0.011 | | l.s.d (P<0.05) = 0.037 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: NDVI reading barley 6 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 0.53 | 0.57 | 0.57 | *0.56* |
| **Buff** | 0.54 | 0.56 | 0.60 | *0.57* |
| **Spartacus** | 0.56 | 0.59 | 0.60 | *0.58* |
| **Planet** | 0.62 | 0.61 | 0.65 | *0.63* |
| ***Means*** | *0.56* | *0.58* | *0.61* |  |
|  | Significance (Variety) P = 0.005 | | l.s.d (P<0.05) = 0.037 | |
|  | Significance (Decile) P= 0.044 | | l.s.d (P<0.05) = 0.032 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 2.43 | 2.49 | 2.29 | *2.40* |
| **Buff** | 2.21 | 2.24 | 2.31 | *2.25* |
| **Spartacus** | 2.24 | 2.26 | 2.21 | *2.24* |
| **Planet** | 1.84 | 1.70 | 1.60 | *1.71* |
| ***Means*** | *2.18* | *2.17* | *2.10* |  |
|  | Significance (Variety) P <0.0001 | | l.s.d (P<0.05) = 0.209 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 12.6 | 11.5 | 12.5 | *12.2* |
| **Buff** | 11.8 | 12.2 | 12.1 | *12.0* |
| **Spartacus** | 12.3 | 13.3 | 13.4 | *13.0* |
| **Planet** | 12.7 | 13.6 | 13.9 | *13.4* |
| ***Means*** | *12.3* | *12.6* | *13.0* |  |
|  | Significance (Variety) P = 0.017 | | l.s.d (P<0.05) = 0.94 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 68.3 | 69.7 | 66.4 | *68.2* |
| **Buff** | 69.2 | 62.4 | 61.7 | *64.4* |
| **Spartacus** | 63.5 | 82.0 | 63.2 | *69.6* |
| **Planet** | 60.7 | 59.4 | 56.8 | *59.0* |
| ***Means*** | *65.4* | *68.4* | *62.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 9: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 63.6 | 61.6 | 61.6 | *62.3* |
| **Buff** | 62.2 | 61.3 | 61.4 | *61.6* |
| **Spartacus** | 63.4 | 62.7 | 62.3 | *62.8* |
| **Planet** | 65.4 | 64.7 | 64.8 | *65.0* |
| ***Means*** | *63.6* | *62.6* | *62.5* |  |
|  | Significance (Variety) P = 0.005 | | l.s.d (P<0.05) = 1.77 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 10: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 34.2 | 37.9 | 37.2 | *36.4* |
| **Buff** | 29.0 | 38.9 | 32.5 | *33.5* |
| **Spartacus** | 30.0 | 31.6 | 30.6 | *30.7* |
| **Planet** | 32.1 | 33.0 | 31.2 | *32.1* |
| ***Means*** | *31.3* | *35.3* | *32.9* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 11: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 4** | **Decile 7** | **Decile 9** | ***Means*** |
| **Rosalind** | 65.8 | 62.1 | 62.8 | *63.6* |
| **Buff** | 71.0 | 61.1 | 67.5 | *66.5* |
| **Spartacus** | 70.0 | 68.4 | 69.4 | *69.3* |
| **Planet** | 67.9 | 67.0 | 68.8 | *67.9* |
| ***Means*** | *68.6* | *64.6* | *67.1* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

## Location 3: Merredin

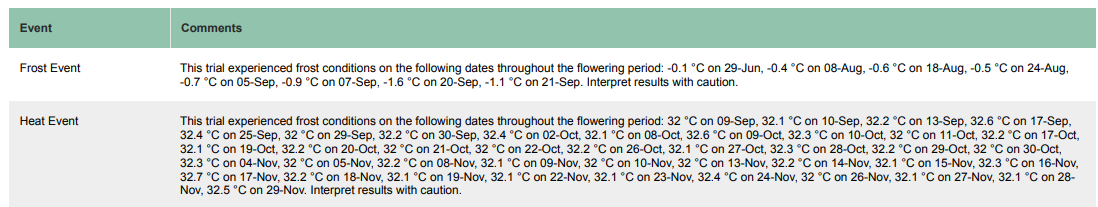
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Merredin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 26 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

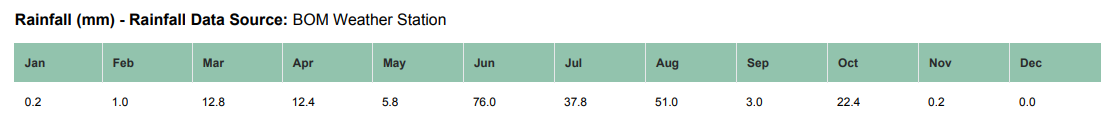
***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Merredin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 26 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

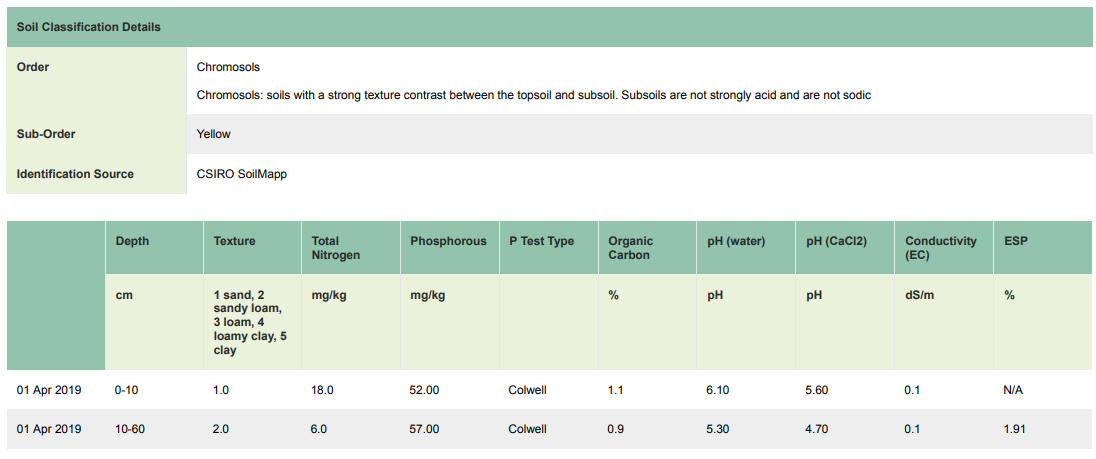
***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***



***Soil Testing***



***Fertiliser Treatments***

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 1** | 8 | 0 |
| **Decile 4** | 8 | 42 |
| **Decile 7** | 8 | 57 |

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.7 | 9.0 | 8.0 | *8.6* |
| **Trojan** | 8.7 | 8.3 | 8.3 | *8.4* |
| **Devil** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Ninja** | 8.7 | 8.3 | 8.7 | *8.6* |
| ***Means*** | *8.8* | *8.7* | *8.5* |  |
|  | Significance (Variety) P = 0.038 | | l.s.d (P<0.05) = 0.4 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.0 | 8.3 | 8.3 | *8.2* |
| **Trojan** | 8.7 | 8.0 | 8.3 | *8.3* |
| **Devil** | 8.7 | 8.3 | 8.0 | *8.3* |
| **Ninja** | 8.7 | 8.3 | 9.0 | *8.7* |
| ***Means*** | *8.5* | *8.3* | *8.4* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 7 August

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.33 | 0.35 | 0.32 | *0.34* |
| **Trojan** | 0.29 | 0.31 | 0.28 | *0.29* |
| **Devil** | 0.40 | 0.38 | 0.36 | *0.38* |
| **Ninja** | 0.37 | 0.32 | 0.34 | *0.34* |
| ***Means*** | *0.34* | *0.33* | *0.32* |  |
|  | Significance (Variety) P = 0.005 | | l.s.d (P<0.05) = 0.044 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 9 September

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.42 | 0.46 | 0.48 | *0.45* |
| **Trojan** | 0.34 | 0.40 | 0.37 | *0.37* |
| **Devil** | 0.35 | 0.52 | 0.47 | *0.45* |
| **Ninja** | 0.41 | 0.43 | 0.55 | *0.46* |
| ***Means*** | *0.38* | *0.45* | *0.46* |  |
|  | Significance (Variety) P = 0.022 | | l.s.d (P<0.05) = 0.064 | |
|  | Significance (Decile) P= 0.007 | | l.s.d (P<0.05) = 0.055 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 1.37 | 1.27 | 1.35 | *1.33* |
| **Trojan** | 0.85 | 1.02 | 0.98 | *0.95* |
| **Devil** | 1.17 | 1.34 | 1.35 | *1.29* |
| **Ninja** | 1.10 | 1.27 | 1.30 | *1.22* |
| ***Means*** | *1.12* | *1.22* | *1.24* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.107 | |
|  | Significance (Decile) P= 0.023 | | l.s.d (P<0.05) = 0.092 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.7 | 9.5 | 10.1 | *9.4* |
| **Trojan** | 9.0 | 10.8 | 11.8 | *10.5* |
| **Devil** | 8.2 | 10.1 | 10.2 | *9.5* |
| **Ninja** | 8.4 | 9.2 | 10.8 | *9.4* |
| ***Means*** | *8.5* | *9.8* | *10.7* |  |
|  | Significance (Variety) P = 0.004 | | l.s.d (P<0.05) = 0.65 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.56 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 78.6 | 77.0 | 76.8 | *77.5* |
| **Trojan** | 81.1 | 80.4 | 80.8 | *80.8* |
| **Devil** | 77.3 | 74.9 | 75.5 | *75.9* |
| **Ninja** | 78.3 | 78.6 | 78.5 | *78.5* |
| ***Means*** | *78.8* | *77.7* | *77.8* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.16 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 4.3 | 6.9 | 7.8 | *6.3* |
| **Trojan** | 5.7 | 6.9 | 7.2 | *6.6* |
| **Devil** | 4.3 | 6.8 | 7.0 | *6.0* |
| **Ninja** | 4.4 | 5.0 | 4.9 | *4.8* |
| ***Means*** | *4.6* | *6.4* | *6.7* |  |
|  | Significance (Variety) P = 0.001 | | l.s.d (P<0.05) = 0.86 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.74 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.7 | 9.0 | 8.7 | *8.8* |
| **Buff** | 8.3 | 8.7 | 8.7 | *8.6* |
| **Spartacus** | 8.3 | 8.3 | 9.0 | *8.6* |
| **Planet** | 9.0 | 8.7 | 9.0 | *8.9* |
| ***Means*** | *8.6* | *8.7* | *8.8* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.0 | 8.3 | 8.7 | *8.3* |
| **Buff** | 8.3 | 8.7 | 8.0 | *8.3* |
| **Spartacus** | 7.7 | 7.7 | 8.0 | *7.8* |
| **Planet** | 7.7 | 8.0 | 7.7 | *7.8* |
| ***Means*** | *7.9* | *8.2* | *8.1* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.33 | 0.30 | 0.33 | *0.32* |
| **Buff** | 0.36 | 0.39 | 0.35 | *0.37* |
| **Spartacus** | 0.30 | 0.28 | 0.27 | *0.28* |
| **Planet** | 0.27 | 0.29 | 0.29 | *0.28* |
| ***Means*** | *0.32* | *0.31* | *0.31* |  |
|  | Significance (Variety) P = 0.018 | | l.s.d (P<0.05) = 0.057 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 9 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.28 | 0.34 | 0.38 | *0.33* |
| **Buff** | 0.31 | 0.42 | 0.39 | *0.37* |
| **Spartacus** | 0.28 | 0.34 | 0.37 | *0.33* |
| **Planet** | 0.30 | 0.42 | 0.41 | *0.37* |
| ***Means*** | *0.29* | *0.38* | *0.39* |  |
|  | Significance (Variety) P = 0.009 | | l.s.d (P<0.05) = 0.034 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.029 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 1.03 | 0.97 | 0.99 | *1.00* |
| **Buff** | 0.93 | 1.28 | 1.21 | *1.14* |
| **Spartacus** | 0.67 | 0.81 | 0.89 | *0.79* |
| **Planet** | 0.61 | 0.65 | 0.69 | *0.65* |
| ***Means*** | *0.81* | *0.93* | *0.95* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.103 | |
|  | Significance (Decile) P= 0.009 | | l.s.d (P<0.05) = 0.089 | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.8 | 10.9 | 12.0 | *10.6* |
| **Buff** | 9.2 | 10.4 | 10.8 | *10.1* |
| **Spartacus** | 10.0 | 12.4 | 13.1 | *11.8* |
| **Planet** | 9.6 | 12.0 | 12.7 | *11.5* |
| ***Means*** | *9.4* | *11.4* | *12.2* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.31 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.27 | |
|  | Significance (Variety \* Decile) P = 0.002 | | l.s.d (P<0.05) = 0.53 | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 65.5 | 63.6 | 63.0 | *64.0* |
| **Buff** | 66.1 | 65.5 | 64.8 | *65.5* |
| **Spartacus** | 66.2 | 64.7 | 64.2 | *65.0* |
| **Planet** | 64.7 | 62.3 | 61.7 | *62.9* |
| ***Means*** | *65.6* | *64.0* | *63.4* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.42 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.37 | |
|  | Significance (Variety \* Decile) P = 0.043 | | l.s.d (P<0.05) = 0.73 | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 63.8 | 63.6 | 62.7 | *63.4* |
| **Buff** | 60.1 | 60.2 | 60.5 | *60.3* |
| **Spartacus** | 67.5 | 63.8 | 63.9 | *65.0* |
| **Planet** | 63.0 | 62.4 | 62.5 | *62.6* |
| ***Means*** | *63.6* | *62.5* | *62.4* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.93 | |
|  | Significance (Decile) P = 0.010 | | l.s.d (P<0.05) = 0.81 | |
|  | Significance (Variety \* Decile) P = 0.016 | | l.s.d (P<0.05) = 1.61 | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 52.9 | 61.4 | 70.0 | *61.4* |
| **Buff** | 49.1 | 51.8 | 47.5 | *49.5* |
| **Spartacus** | 32.5 | 54.6 | 54.1 | *47.0* |
| **Planet** | 56.8 | 56.9 | 59.8 | *57.8* |
| ***Means*** | *47.8* | *56.2* | *57.8* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 5.09 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 4.40 | |
|  | Significance (Variety \* Decile) P = 0.004 | | l.s.d (P<0.05) = 8.81 | |

Table 10: Plump screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 47.1 | 38.6 | 30.0 | *38.6* |
| **Buff** | 50.9 | 48.2 | 52.5 | *50.5* |
| **Spartacus** | 67.5 | 45.4 | 46.0 | *53.0* |
| **Planet** | 43.2 | 43.1 | 40.2 | *42.2* |
| ***Means*** | *52.1* | *43.8* | *42.1* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 5.09 | |
|  | Significance (Decile) P = 0.001 | | l.s.d (P<0.05) = 4.40 | |
|  | Significance (Variety \* Decile) P = 0.004 | | l.s.d (P<0.05) = 8.81 | |

## Location 4: Moorine Rock

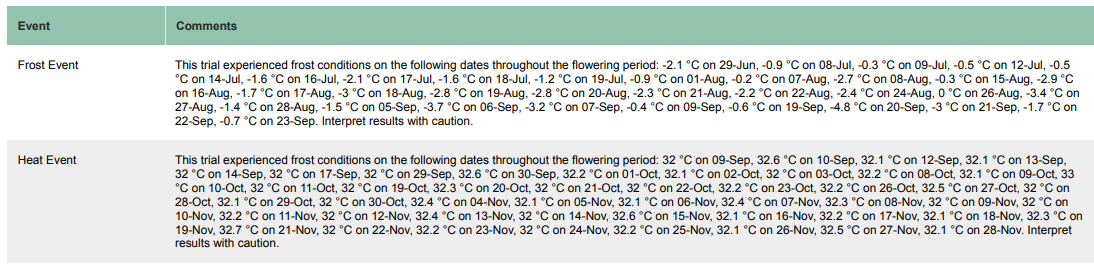
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Moorine Rock |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 27 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

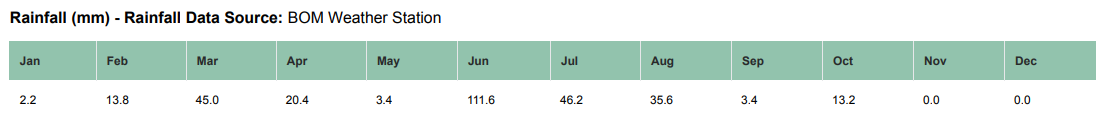
***Barley:***

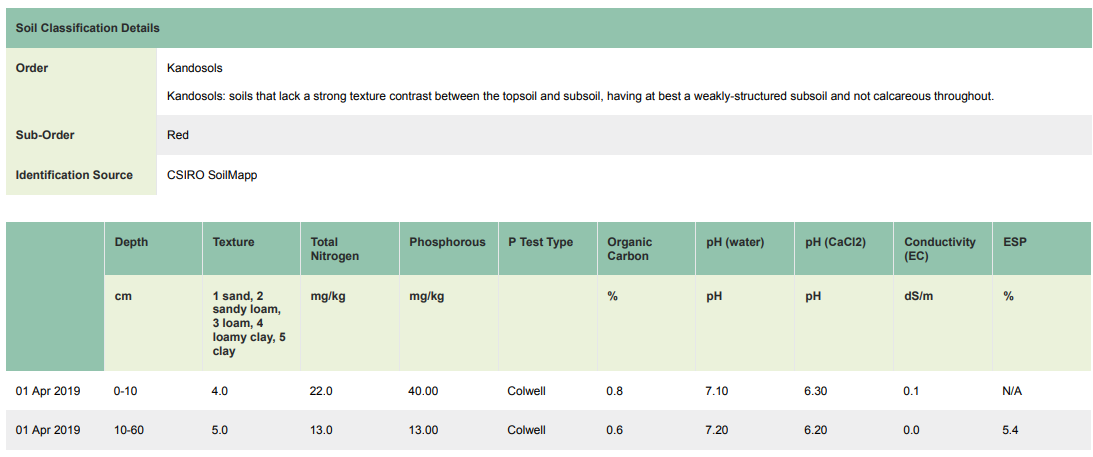
|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location**: Moorine Rock |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 27 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***



***Soil Testing***

***Fertiliser Treatments***

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 1** | 8 | 0 |
| **Decile 4** | 8 | 22 |
| **Decile 7** | 8 | 32 |

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.7 | 8.7 | 9.0 | *8.8* |
| **Trojan** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Devil** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Ninja** | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *8.9* | *8.9* | *9.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Trojan** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Devil** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Ninja** | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *9.0* | *9.0* | *9.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 7 August

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.45 | 0.50 | 0.57 | *0.51* |
| **Trojan** | 0.44 | 0.47 | 0.48 | *0.47* |
| **Devil** | 0.57 | 0.48 | 0.52 | *0.52* |
| **Ninja** | 0.54 | 0.47 | 0.48 | *0.50* |
| ***Means*** | *0.50* | *0.48* | *0.52* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 9 September

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.63 | 0.66 | 0.63 | *0.64* |
| **Trojan** | 0.60 | 0.61 | 0.58 | *0.60* |
| **Devil** | 0.66 | 0.70 | 0.67 | *0.68* |
| **Ninja** | 0.44 | 0.65 | 0.68 | *0.59* |
| ***Means*** | *0.58* | *0.66* | *0.64* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 1.77 | 1.82 | 1.78 | *1.79* |
| **Trojan** | 1.64 | 1.56 | 1.66 | *1.62* |
| **Devil** | 1.91 | 1.92 | 1.95 | *1.93* |
| **Ninja** | 1.71 | 1.76 | 1.71 | *1.73* |
| ***Means*** | *1.76* | *1.76* | *1.78* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.135 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 11.9 | 12.2 | 12.5 | *12.2* |
| **Trojan** | 12.3 | 13.0 | 12.9 | *12.7* |
| **Devil** | 11.6 | 12.3 | 12.6 | *12.2* |
| **Ninja** | 12.7 | 12.6 | 12.6 | *12.6* |
| ***Means*** | *12.1* | *12.5* | *12.6* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 81.9 | 83.0 | 82.7 | *82.5* |
| **Trojan** | 82.5 | 81.6 | 82.6 | *82.3* |
| **Devil** | 80.9 | 81.2 | 81.2 | *81.1* |
| **Ninja** | 80.7 | 81.4 | 80.6 | *80.9* |
| ***Means*** | *81.5* | *81.8* | *81.8* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.61 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 2.1 | 1.7 | 2.3 | *2.0* |
| **Trojan** | 4.2 | 4.3 | 3.2 | *3.9* |
| **Devil** | 1.5 | 1.6 | 1.3 | *1.5* |
| **Ninja** | 1.7 | 1.9 | 1.8 | *1.8* |
| ***Means*** | *2.4* | *2.4* | *2.2* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.96 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Buff** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Spartacus** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Planet** | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *9.0* | *9.0* | *9.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Buff** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Spartacus** | 9.0 | 9.0 | 9.0 | *9.0* |
| **Planet** | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *9.0* | *9.0* | *9.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.50 | 0.46 | 0.52 | *0.49* |
| **Buff** | 0.57 | 0.52 | 0.50 | *0.53* |
| **Spartacus** | 0.50 | 0.45 | 0.45 | *0.46* |
| **Planet** | 0.45 | 0.44 | 0.48 | *0.46* |
| ***Means*** | *0.51* | *0.47* | *0.49* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 9 September

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.56 | 0.56 | 0.63 | *0.58* |
| **Buff** | 0.62 | 0.63 | 0.66 | *0.64* |
| **Spartacus** | 0.63 | 0.67 | 0.60 | *0.63* |
| **Planet** | 0.67 | 0.68 | 0.73 | *0.69* |
| ***Means*** | *0.62* | *0.63* | *0.65* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.034 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 2.05 | 1.96 | 1.91 | *1.97* |
| **Buff** | 1.96 | 1.88 | 1.82 | *1.89* |
| **Spartacus** | 2.06 | 2.24 | 2.09 | *2.13* |
| **Planet** | 1.45 | 1.32 | 1.38 | *1.38* |
| ***Means*** | *1.88* | *1.85* | *1.80* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.196 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 13.3 | 13.2 | 14.3 | *13.6* |
| **Buff** | 11.9 | 12.4 | 12.4 | *12.2* |
| **Spartacus** | 13.4 | 13.0 | 12.9 | *13.1* |
| **Planet** | 13.5 | 15.3 | 14.7 | *14.5* |
| ***Means*** | *13.0* | *13.5* | *13.6* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.7 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 60.9 | 61.1 | 59.9 | *60.6* |
| **Buff** | 61.7 | 61.1 | 61.0 | *61.3* |
| **Spartacus** | 63.0 | 63.4 | 63.6 | *63.3* |
| **Planet** | 60.0 | 57.7 | 58.4 | *58.7* |
| ***Means*** | *61.4* | *60.8* | *60.7* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.79 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 66.4 | 66.7 | 66.5 | *66.6* |
| **Buff** | 63.7 | 63.3 | 63.0 | *63.3* |
| **Spartacus** | 67.1 | 65.7 | 66.8 | *66.5* |
| **Planet** | 65.3 | 65.1 | 65.2 | *65.2* |
| ***Means*** | *65.6* | *65.2* | *65.4* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.69 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 66.8 | 69.3 | 77.2 | *71.1* |
| **Buff** | 46.0 | 45.1 | 49.6 | *46.9* |
| **Spartacus** | 71.8 | 69.4 | 66.2 | *69.1* |
| **Planet** | 68.3 | 72.9 | 70.4 | *70.5* |
| ***Means*** | *63.2* | *64.2* | *65.9* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 5.05 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 10: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 33.2 | 30.7 | 22.8 | 28.9 |
| **Buff** | 54.0 | 54.9 | 50.4 | 53.1 |
| **Spartacus** | 28.2 | 30.6 | 33.8 | 30.9 |
| **Planet** | 31.8 | 27.1 | 29.6 | 29.5 |
| ***Means*** | 36.8 | 35.8 | 34.1 |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 5.05 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

## Location 5: Mukinbudin

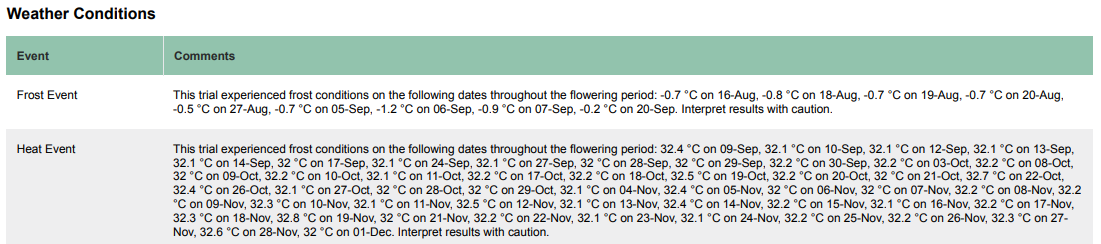
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Mukinbudin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 27 November 2019 |  |
| **Previous Crop:** Wheat |  |  |  |

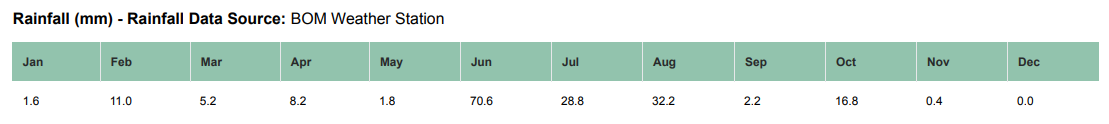
***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Mukinbudin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 27 November 2019 |  |
| **Previous Crop:** Wheat |  |  |  |

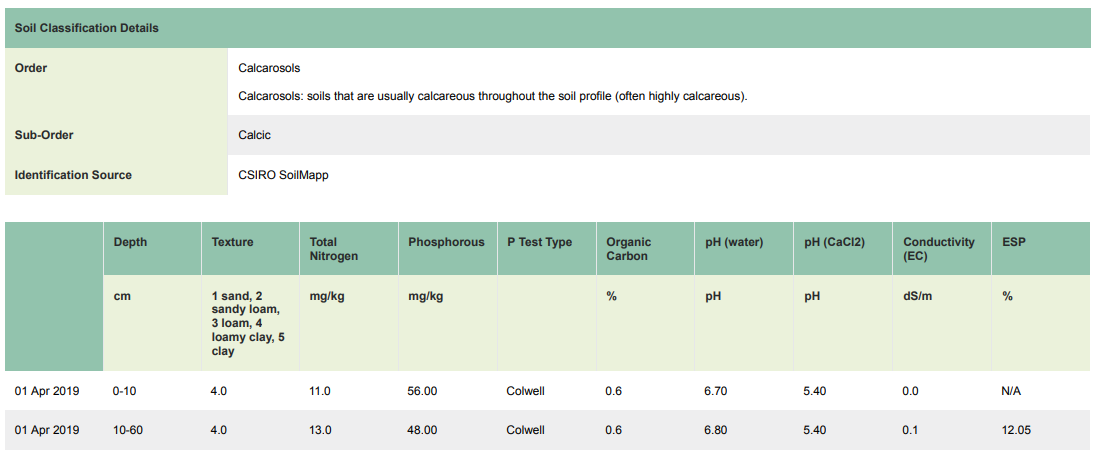
***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***



***Soil Testing***



***Fertiliser Treatments***

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 1** | 8 | 0 |
| **Decile 4** | 8 | 22 |
| **Decile 7** | 8 | 32 |

***Results***

***Wheat***

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 7.7 | 8.3 | 8.0 | *8.0* |
| **Trojan** | 7.3 | 7.3 | 7.0 | *7.2* |
| **Devil** | 8.3 | 8.3 | 8.7 | *8.4* |
| **Ninja** | 8.3 | 8.3 | 8.7 | *8.4* |
| ***Means*** | *7.9* | *8.1* | *8.1* |  |
|  | Significance (Variety) P = 0.001 | | l.s.d (P<0.05) = 0.6 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 7.7 | 8.3 | 8.0 | *8.0* |
| **Trojan** | 7.7 | 8.3 | 7.3 | *7.8* |
| **Devil** | 9.0 | 8.3 | 8.7 | *8.7* |
| **Ninja** | 8.3 | 8.3 | 9.0 | *8.6* |
| ***Means*** | *8.2* | *8.3* | *8.3* |  |
|  | Significance (Variety) P = 0.037 | | l.s.d (P<0.05) = 0.7 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 8 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.43 | 0.39 | 0.42 | *0.41* |
| **Trojan** | 0.43 | 0.40 | 0.42 | *0.42* |
| **Devil** | 0.43 | 0.40 | 0.42 | *0.42* |
| **Ninja** | 0.44 | 0.40 | 0.45 | *0.43* |
| ***Means*** | *0.43* | *0.40* | *0.43* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 9 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.37 | 0.38 | 0.38 | *0.38* |
| **Trojan** | 0.36 | 0.39 | 0.36 | *0.37* |
| **Devil** | 0.36 | 0.42 | 0.39 | *0.39* |
| **Ninja** | 0.36 | 0.39 | 0.41 | *0.39* |
| ***Means*** | *0.36* | *0.40* | *0.38* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.61 | 0.57 | 0.55 | *0.58* |
| **Trojan** | 0.50 | 0.63 | 0.55 | *0.56* |
| **Devil** | 0.57 | 0.52 | 0.58 | *0.56* |
| **Ninja** | 0.56 | 0.55 | 0.53 | *0.55* |
| ***Means*** | *0.56* | *0.57* | *0.56* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 11.9 | 10.8 | 12.0 | *11.6* |
| **Trojan** | 12.0 | 12.5 | 12.4 | *12.3* |
| **Devil** | 10.8 | 11.4 | 11.6 | *11.2* |
| **Ninja** | 11.5 | 11.3 | 12.1 | *11.6* |
| ***Means*** | *11.5* | *11.5* | *12.0* |  |
|  | Significance (Variety) P = 0.005 | | l.s.d (P<0.05) = 0.57 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 78.6 | 78.0 | 77.5 | *78.1* |
| **Trojan** | 79.5 | 79.5 | 80.8 | *80.0* |
| **Devil** | 77.9 | 76.1 | 77.2 | *77.1* |
| **Ninja** | 78.0 | 78.5 | 77.1 | *77.9* |
| ***Means*** | *78.5* | *78.0* | *78.2* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.93 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 6.2 | 7.1 | 6.1 | *6.5* |
| **Trojan** | 5.8 | 7.9 | 5.7 | *6.5* |
| **Devil** | 6.7 | 9.2 | 8.5 | *8.1* |
| **Ninja** | 4.9 | 4.7 | 6.3 | *5.3* |
| ***Means*** | *5.9* | *7.3* | *6.6* |  |
|  | Significance (Variety) P = 0.008 | | l.s.d (P<0.05) = 1.51 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

***BARLEY***

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.0 | 8.3 | 8.0 | *8.1* |
| **Buff** | 8.0 | 8.0 | 8.3 | *8.1* |
| **Spartacus** | 7.3 | 8.0 | 8.3 | *7.9* |
| **Planet** | 7.7 | 8.3 | 8.7 | *8.2* |
| ***Means*** | *7.8* | *8.2* | *8.3* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.3 | 8.3 | 8.7 | *8.4* |
| **Buff** | 8.7 | 8.7 | 8.7 | *8.7* |
| **Spartacus** | 8.3 | 9.0 | 8.7 | *8.7* |
| **Planet** | 8.7 | 8.7 | 8.7 | *8.7* |
| ***Means*** | *8.5* | *8.7* | *8.7* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.43 | 0.39 | 0.39 | *0.41* |
| **Buff** | 0.45 | 0.45 | 0.45 | *0.43* |
| **Spartacus** | 0.34 | 0.40 | 0.40 | *0.39* |
| **Planet** | 0.44 | 0.39 | 0.39 | *0.41* |
| ***Means*** | *0.42* | *0.41* | *0.41* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 9 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.41 | 0.38 | 0.46 | *0.42* |
| **Buff** | 0.41 | 0.40 | 0.41 | *0.41* |
| **Spartacus** | 0.42 | 0.43 | 0.48 | *0.45* |
| **Planet** | 0.43 | 0.42 | 0.45 | *0.43* |
| ***Means*** | *0.42* | *0.41* | *0.45* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.53 | 0.50 | 0.51 | *0.51* |
| **Buff** | 0.40 | 0.38 | 0.36 | *0.38* |
| **Spartacus** | 0.56 | 0.55 | 0.57 | *0.56* |
| **Planet** | 0.29 | 0.31 | 0.31 | *0.30* |
| ***Means*** | *0.44* | *0.43* | *0.44* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.061 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 12.0 | 12.2 | 12.7 | *12.3* |
| **Buff** | 11.5 | 12.4 | 12.0 | *11.9* |
| **Spartacus** | 11.8 | 12.3 | 12.3 | *12.1* |
| **Planet** | 14.2 | 13.6 | 14.4 | *14.1* |
| ***Means*** | *12.4* | *12.6* | *12.8* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.83 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

## Location 6: Tincurrin

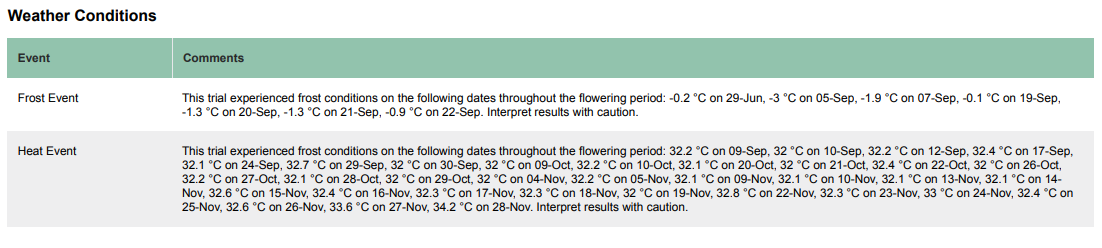
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Tincurrin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 21 November 2019 |  |
| **Previous Crop:** Pasture |  |  |  |

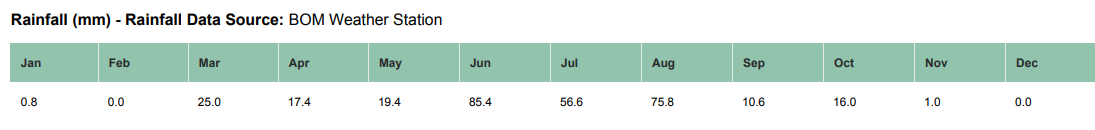
***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Tincurrin |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 21 November 2019 |  |
| **Previous Crop:** Pasture |  |  |  |

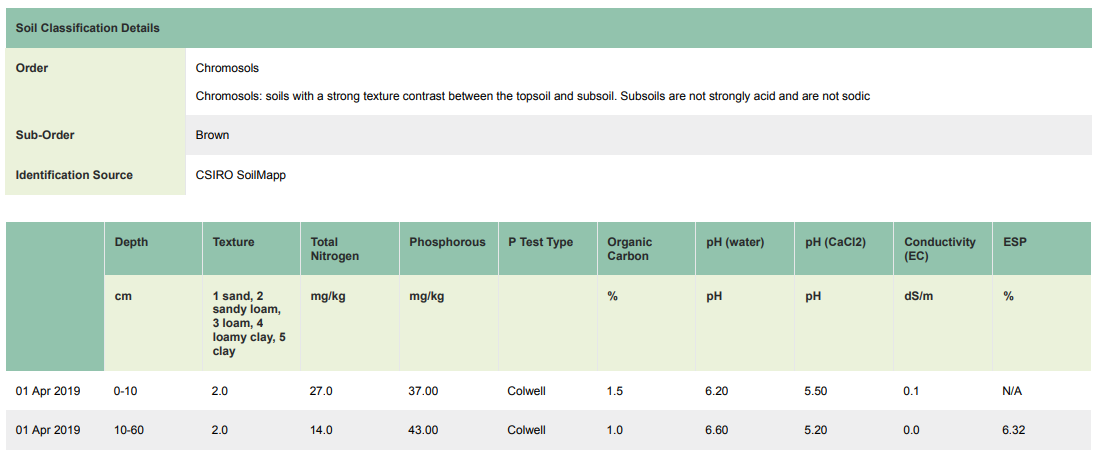
***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***



***Soil Testing***



***Fertiliser Treatments***

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 1** | 10 | 0 |
| **Decile 4** | 10 | 42 |
| **Decile 7** | 10 | 58 |

***Results***

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 7.7 | 8.3 | 8.0 | *8.2* |
| **Trojan** | 7.3 | 7.3 | 7.0 | *8.1* |
| **Devil** | 8.3 | 8.3 | 8.7 | *8.4* |
| **Ninja** | 8.3 | 8.3 | 8.7 | *8.7* |
| ***Means*** | *8.2* | *8.6* | *8.3* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.0 | 8.7 | 9.0 | *8.6* |
| **Trojan** | 9.0 | 8.7 | 9.0 | *8.9* |
| **Devil** | 8.7 | 9.0 | 8.7 | *8.8* |
| **Ninja** | 9.0 | 9.0 | 9.0 | *9.0* |
| ***Means*** | *8.7* | *8.8* | *8.9* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 8 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.54 | 0.54 | 0.51 | *0.53* |
| **Trojan** | 0.51 | 0.50 | 0.50 | *0.50* |
| **Devil** | 0.57 | 0.59 | 0.54 | *0.57* |
| **Ninja** | 0.60 | 0.54 | 0.56 | *0.56* |
| ***Means*** | *0.55* | *0.54* | *0.53* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 26 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.69 | 0.73 | 0.73 | *0.72* |
| **Trojan** | 0.67 | 0.72 | 0.75 | *0.72* |
| **Devil** | 0.76 | 0.75 | 0.76 | *0.76* |
| **Ninja** | 0.73 | 0.74 | 0.74 | *0.74* |
| ***Means*** | *0.71* | *0.74* | *0.75* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 2.35 | 2.41 | 2.06 | *2.27* |
| **Trojan** | 1.81 | 1.70 | 1.84 | *1.78* |
| **Devil** | 2.54 | 2.22 | 2.34 | *2.36* |
| **Ninja** | 2.01 | 2.26 | 2.12 | *2.13* |
| ***Means*** | *2.18* | *2.15* | *2.09* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.246 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 11.6 | 11.9 | 12.6 | *12.1* |
| **Trojan** | 11.8 | 13.3 | 13.4 | *12.9* |
| **Devil** | 11.1 | 12.3 | 12.3 | *11.9* |
| **Ninja** | 12.1 | 12.2 | 12.9 | *12.4* |
| ***Means*** | *11.6* | *12.5* | *12.8* |  |
|  | Significance (Variety) P = 0.014 | | l.s.d (P<0.05) = 0.59 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 83.1 | 83.3 | 82.0 | *82.8* |
| **Trojan** | 82.9 | 82.2 | 82.4 | *82.5* |
| **Devil** | 82.1 | 81.6 | 82.5 | *82.1* |
| **Ninja** | 81.4 | 81.9 | 81.3 | *81.6* |
| ***Means*** | *82.4* | *82.3* | *82.0* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 3.4 | 3.2 | 4.5 | *3.7* |
| **Trojan** | 6.9 | 7.7 | 7.1 | *7.2* |
| **Devil** | 1.8 | 2.3 | 1.8 | *2.0* |
| **Ninja** | 3.8 | 3.6 | 3.9 | *3.8* |
| ***Means*** | *4.0* | *4.2* | *4.3* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.96 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

***BARLEY***

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.3 | 8.3 | 8.0 | *8.2* |
| **Buff** | 8.0 | 8.7 | 8.0 | *8.2* |
| **Spartacus** | 7.3 | 8.3 | 8.3 | *8.0* |
| **Planet** | 8.0 | 8.0 | 8.7 | *8.2* |
| ***Means*** | *7.9* | *8.3* | *8.3* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 9.0 | 9.0 | 8.7 | *8.9* |
| **Buff** | 8.3 | 8.7 | 8.7 | *8.6* |
| **Spartacus** | 8.7 | 8.7 | 8.3 | *8.6* |
| **Planet** | 8.3 | 8.3 | 9.0 | *8.6* |
| ***Means*** | *8.6* | *8.7* | *8.7* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 8 August

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.40 | 0.44 | 0.47 | *0.44* |
| **Buff** | 0.50 | 0.52 | 0.53 | *0.52* |
| **Spartacus** | 0.41 | 0.43 | 0.46 | *0.43* |
| **Planet** | 0.57 | 0.49 | 0.56 | *0.54* |
| ***Means*** | *0.47* | *0.47* | *0.50* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.030 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 26 August

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.64 | 0.65 | 0.68 | *0.66* |
| **Buff** | 0.67 | 0.65 | 0.67 | *0.66* |
| **Spartacus** | 0.63 | 0.68 | 0.67 | *0.66* |
| **Planet** | 0.71 | 0.69 | 0.73 | *0.71* |
| ***Means*** | *0.66* | *0.67* | *0.69* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.046 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 1.57 | 1.73 | 1.70 | *1.66* |
| **Buff** | 1.66 | 1.39 | 1.83 | *1.63* |
| **Spartacus** | 1.49 | 1.71 | 1.63 | *1.61* |
| **Planet** | 1.44 | 1.18 | 1.44 | *1.35* |
| ***Means*** | *1.54* | *1.50* | *1.65* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 12.7 | 14.0 | 14.2 | *13.6* |
| **Buff** | 12.7 | 14.3 | 13.2 | *13.4* |
| **Spartacus** | 13.7 | 14.6 | 15.0 | *14.4* |
| **Planet** | 13.7 | 16.3 | 15.4 | *15.1* |
| ***Means*** | *13.2* | *14.8* | *14.4* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.67 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.58 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 62.4 | 61.0 | 60.6 | *61.3* |
| **Buff** | 63.5 | 62.5 | 63.3 | *63.1* |
| **Spartacus** | 64.1 | 62.6 | 62.1 | *62.9* |
| **Planet** | 61.0 | 58.5 | 59.2 | *59.6* |
| ***Means*** | *62.7* | *61.1* | *61.2* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.30 | |
|  | Significance (Decile) P = 0.014 | | l.s.d (P<0.05) = 1.12 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 60.2 | 61.9 | 62.8 | *61.6* |
| **Buff** | 62.1 | 61.3 | 62.5 | *61.9* |
| **Spartacus** | 61.5 | 62.3 | 62.1 | *62.0* |
| **Planet** | 64.3 | 63.4 | 65.1 | *64.2* |
| ***Means*** | *62.0* | *62.2* | *63.1* |  |
|  | Significance (Variety) P = 0.010 | | l.s.d (P<0.05) = 0.95 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 59.8 | 55.7 | 52.6 | *56.0* |
| **Buff** | 46.0 | 52.3 | 47.3 | *48.5* |
| **Spartacus** | 58.6 | 59.3 | 63.9 | *60.6* |
| **Planet** | 54.3 | 56.9 | 51.3 | *54.2* |
| ***Means*** | *54.7* | *56.1* | *53.7* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 7.72 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 10: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 40.2 | 44.3 | 47.4 | *44.0* |
| **Buff** | 54.0 | 47.7 | 52.7 | *51.5* |
| **Spartacus** | 41.4 | 40.7 | 36.1 | *39.4* |
| **Planet** | 45.7 | 43.1 | 48.8 | *45.8* |
| ***Means*** | *45.2* | *43.9* | *46.2* |  |
|  | Significance (Variety) P = 0.011 | | l.s.d (P<0.05) = 6.78 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 60.3 | 60.0 | 59.6 | *60.0* |
| **Buff** | 55.8 | 59.4 | 63.7 | *59.6* |
| **Spartacus** | 61.5 | 61.3 | 61.1 | *61.3* |
| **Planet** | 57.0 | 57.6 | 57.3 | *57.3* |
| ***Means*** | *58.6* | *59.5* | *60.4* |  |
|  | Significance (Variety) P = 0.016 | | l.s.d (P<0.05) = 2.35 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 62.2 | 61.8 | 61.6 | *61.9* |
| **Buff** | 59.5 | 56.9 | 58.7 | *58.4* |
| **Spartacus** | 64.0 | 63.3 | 62.3 | *63.2* |
| **Planet** | 61.6 | 62.9 | 61.9 | *62.1* |
| ***Means*** | *61.8* | *61.2* | *61.1* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.02 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 69.6 | 77.4 | 78.3 | *75.1* |
| **Buff** | 56.0 | 53.0 | 57.6 | *55.5* |
| **Spartacus** | 70.0 | 71.1 | 69.5 | *70.2* |
| **Planet** | 86.0 | 81.7 | 80.9 | *82.8* |
| ***Means*** | *70.4* | *70.8* | *71.5* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 6.57 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 10: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 30.4 | 22.6 | 21.7 | *24.9* |
| **Buff** | 44.0 | 47.0 | 42.4 | *44.5* |
| **Spartacus** | 30.0 | 28.9 | 30.5 | *29.8* |
| **Planet** | 14.0 | 18.3 | 19.1 | *17.2* |
| ***Means*** | *29.5* | *29.1* | *28.4* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 6.57 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

## Location 7: Wyalkatchem

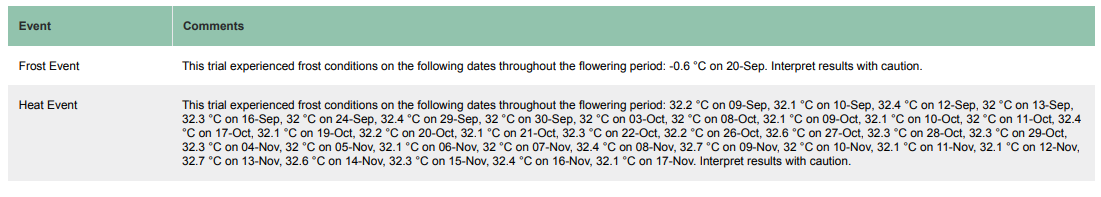
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Wyalkatchem |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 15 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

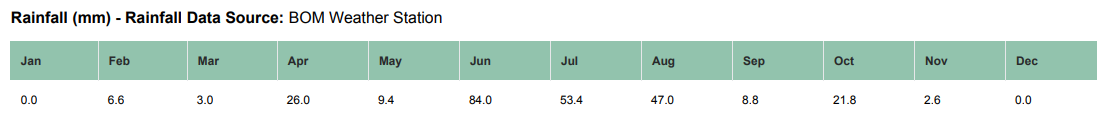
***Barley:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** Wyalkatchem |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 15 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

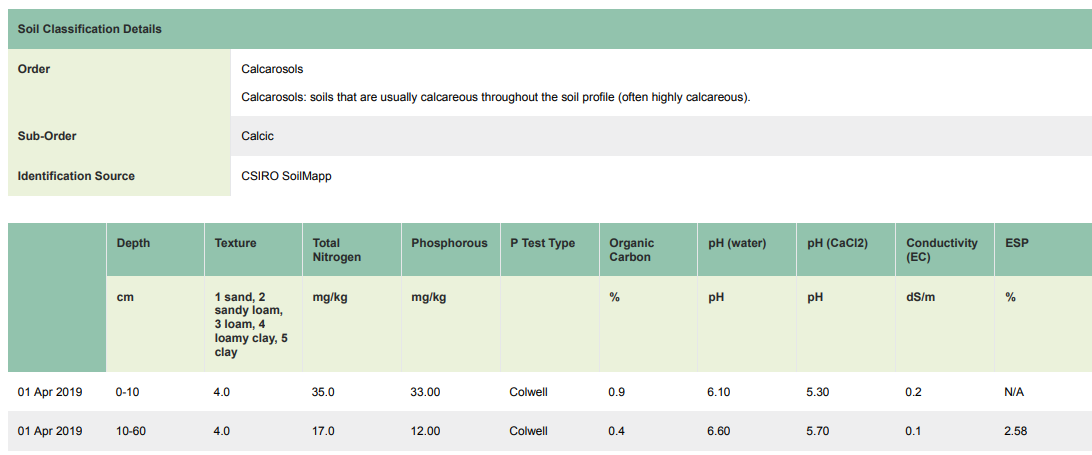
***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***



***Soil Testing***



***Fertiliser Treatments***

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 1** | 8 | 0 |
| **Decile 4** | 8 | 42 |
| **Decile 7** | 8 | 57 |

***Results***

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.3 | 8.3 | 7.7 | *8.1* |
| **Trojan** | 7.7 | 8.0 | 7.7 | *7.8* |
| **Devil** | 9.0 | 8.7 | 8.0 | *8.6* |
| **Ninja** | 8.3 | 8.7 | 8.3 | *8.4* |
| ***Means*** | *8.3* | *8.4* | *7.9* |  |
|  | Significance (Variety) P = 0.019 | | l.s.d (P<0.05) = 0.50 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.7 | 9.0 | 8.0 | *8.6* |
| **Trojan** | 7.3 | 7.7 | 7.3 | *7.4* |
| **Devil** | 8.7 | 8.0 | 8.3 | *8.3* |
| **Ninja** | 8.7 | 8.0 | 8.7 | *8.4* |
| ***Means*** | *8.3* | *8.2* | *8.1* |  |
|  | Significance (Variety) P = 0.024 | | l.s.d (P<0.05) = 0.80 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.49 | 0.45 | 0.45 | *0.46* |
| **Trojan** | 0.50 | 0.47 | 0.49 | *0.49* |
| **Devil** | 0.55 | 0.54 | 0.53 | *0.54* |
| **Ninja** | 0.56 | 0.51 | 0.56 | *0.54* |
| ***Means*** | *0.53* | *0.49* | *0.51* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.041 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 26 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.50 | 0.48 | 0.49 | *0.49* |
| **Trojan** | 0.49 | 0.49 | 0.51 | *0.50* |
| **Devil** | 0.49 | 0.54 | 0.60 | *0.54* |
| **Ninja** | 0.54 | 0.52 | 0.59 | *0.55* |
| ***Means*** | *0.51* | *0.51* | *0.55* |  |
|  | Significance (Variety) P = 0.029 | | l.s.d (P<0.05) = 0.046 | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 1.27 | 1.24 | 1.31 | *1.28* |
| **Trojan** | 1.14 | 1.00 | 1.15 | *1.10* |
| **Devil** | 1.23 | 1.17 | 1.22 | *1.21* |
| **Ninja** | 1.12 | 1.17 | 1.21 | *1.17* |
| ***Means*** | *1.19* | *1.15* | *1.22* |  |
|  | Significance (Variety) P = 0.014 | | l.s.d (P<0.05) = 0.104 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 10.8 | 12.1 | 11.6 | *11.5* |
| **Trojan** | 11.3 | 12.9 | 12.9 | *12.4* |
| **Devil** | 11.0 | 12.7 | 12.6 | *12.1* |
| **Ninja** | 10.7 | 11.4 | 12.5 | *11.5* |
| ***Means*** | *10.9* | *12.3* | *12.4* |  |
|  | Significance (Variety) P = 0.046 | | l.s.d (P<0.05) = 0.71 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 80.9 | 80.8 | 81.4 | *81.0* |
| **Trojan** | 82.2 | 81.0 | 81.5 | *81.6* |
| **Devil** | 81.3 | 80.3 | 81.1 | *80.9* |
| **Ninja** | 80.8 | 81.3 | 80.7 | *80.9* |
| ***Means*** | *81.3* | *80.9* | *81.2* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 3.3 | 4.3 | 4.3 | *4.0* |
| **Trojan** | 4.4 | 5.9 | 4.7 | *5.0* |
| **Devil** | 2.4 | 2.5 | 2.3 | *2.4* |
| **Ninja** | 2.6 | 2.7 | 2.3 | *2.5* |
| ***Means*** | *3.2* | *3.8* | *3.4* |  |
|  | Significance (Variety) P = 0.018 | | l.s.d (P<0.05) = 1.78 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

***BARLEY***

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.0 | 8.0 | 8.7 | *8.2* |
| **Buff** | 8.3 | 8.3 | 8.3 | *8.3* |
| **Spartacus** | 8.3 | 8.0 | 8.0 | *8.1* |
| **Planet** | 8.0 | 8.7 | 9.0 | *8.6* |
| ***Means*** | *8.2* | *8.3* | *8.5* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A | |
|  | Significance (Decile) P= N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.7 | 8.3 | 8.0 | *8.3* |
| **Buff** | 8.7 | 8.7 | 8.7 | *8.7* |
| **Spartacus** | 7.7 | 7.7 | 7.7 | *7.7* |
| **Planet** | 8.3 | 8.0 | 7.7 | *8.0* |
| ***Means*** | *8.3* | *8.2* | *8.0* |  |
|  | Significance (Variety) P = 0.013 | | l.s.d (P<0.05) = 0.60 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 8 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.46 | 0.45 | 0.46 | *0.46* |
| **Buff** | 0.52 | 0.52 | 0.53 | *0.52* |
| **Spartacus** | 0.49 | 0.50 | 0.49 | *0.49* |
| **Planet** | 0.55 | 0.53 | 0.53 | *0.53* |
| ***Means*** | *0.50* | *0.50* | *0.50* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.030 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 26 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.47 | 0.48 | 0.46 | *0.47* |
| **Buff** | 0.53 | 0.54 | 0.56 | *0.54* |
| **Spartacus** | 0.52 | 0.54 | 0.52 | *0.53* |
| **Planet** | 0.57 | 0.57 | 0.60 | *0.58* |
| ***Means*** | *0.52* | *0.53* | *0.53* |  |
|  | Significance (Variety) P = 0.0006 | | l.s.d (P<0.05) = 0.046 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.94 | 1.00 | 0.89 | *0.94* |
| **Buff** | 0.94 | 0.81 | 0.92 | *0.89* |
| **Spartacus** | 0.94 | 1.00 | 0.93 | *0.96* |
| **Planet** | 0.60 | 0.52 | 0.52 | *0.55* |
| ***Means*** | *0.86* | *0.83* | *0.82* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.100 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 10.5 | 11.7 | 12.1 | *11.4* |
| **Buff** | 10.7 | 11.7 | 12.4 | *11.6* |
| **Spartacus** | 10.6 | 12.2 | 12.4 | *11.7* |
| **Planet** | 12.7 | 13.9 | 14.2 | *13.6* |
| ***Means*** | *11.1* | *12.3* | *12.7* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.67 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.58 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

## Location 8: York

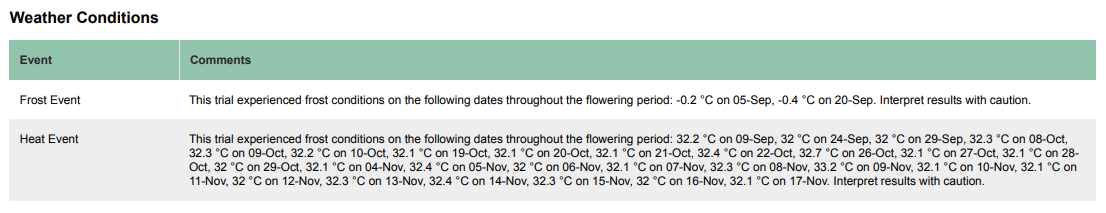
***Wheat:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location:** York |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Scepter, Trojan, Devil and Ninja | |  | | --- | |  | | **Harvest Date:** 15 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

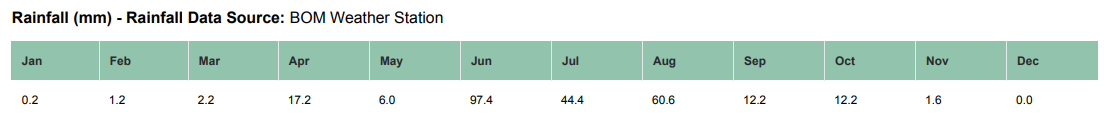
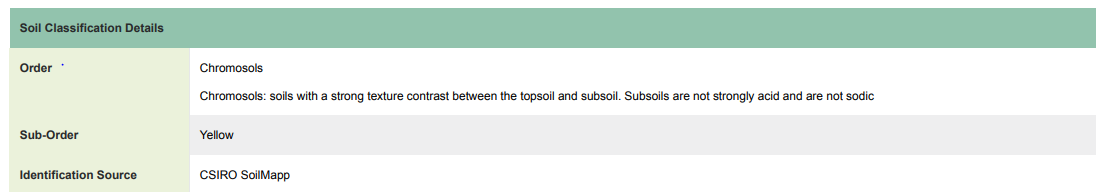
***Barley:***

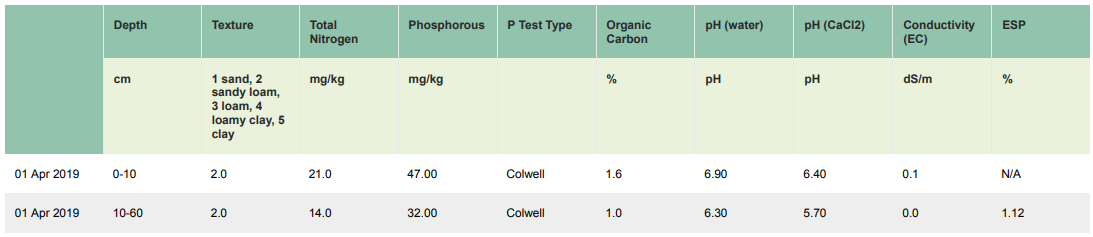
|  |  |  |  |
| --- | --- | --- | --- |
| **Specific Location: York** |  | **Sowing Date:** 7 June 2019 |  |
| **Varieties:** Rosalind, Buff, Spartacus and Planet | |  | | --- | |  | | **Harvest Date:** 15 November 2019 |  |
| **Previous Crop:** Canola |  |  |  |

***Weather conditions***



***Rainfall (mm) Data Source: DPIRD weather station***

***Soil Testing***



***Fertiliser Treatments***

|  |  |  |
| --- | --- | --- |
|  | **N (Pre)** | **N (Post)** |
| **Decile 1** | 12 | 0 |
| **Decile 4** | 12 | 42 |
| **Decile 7** | 12 | 63 |

***Results***

***Wheat***

Table 1: Crop emergence (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 9.0 | 8.3 | 8.0 | *8.4* |
| **Trojan** | 7.7 | 7.7 | 7.7 | *7.7* |
| **Devil** | 8.3 | 8.7 | 8.7 | *8.6* |
| **Ninja** | 8.7 | 8.7 | 9.0 | *8.8* |
| ***Means*** | *8.4* | *8.3* | *8.3* |  |
|  | Significance (Variety) P = 0.004 | | l.s.d (P<0.05) = 0.60 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.7 | 8.7 | 8.3 | *8.6* |
| **Trojan** | 8.7 | 8.0 | 8 | *8.2* |
| **Devil** | 9.0 | 8.7 | 8.7 | *8.8* |
| **Ninja** | 8.7 | 8.7 | 9 | *8.8* |
| ***Means*** | *8.8* | *8.5* | *8.5* |  |
|  | Significance (Variety) P = N.S | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading wheat 7 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.60 | 0.58 | 0.58 | *0.59* |
| **Trojan** | 0.56 | 0.57 | 0.59 | *0.57* |
| **Devil** | 0.64 | 0.69 | 0.63 | *0.65* |
| **Ninja** | 0.63 | 0.63 | 0.64 | *0.64* |
| ***Means*** | *0.61* | *0.62* | *0.61* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.04 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading wheat 6 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 0.66 | 0.68 | 0.69 | *0.68* |
| **Trojan** | 0.63 | 0.69 | 0.72 | *0.68* |
| **Devil** | 0.70 | 0.75 | 0.72 | *0.72* |
| **Ninja** | 0.69 | 0.75 | 0.73 | *0.72* |
| ***Means*** | *0.67* | *0.72* | *0.71* |  |
|  | Significance (Variety) P = 0.012 | | l.s.d (P<0.05) = 0.036 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 3.20 | 3.24 | 3.22 | *3.20* |
| **Trojan** | 2.93 | 2.92 | 2.79 | *2.93* |
| **Devil** | 3.20 | 3.15 | 3.20 | *3.20* |
| **Ninja** | 2.99 | 3.19 | 3.14 | *2.99* |
| ***Means*** | *3.20* | *3.24* | *3.22* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.106 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 8.9 | 9.8 | 9.8 | *9.5* |
| **Trojan** | 8.4 | 10.3 | 11.1 | *9.9* |
| **Devil** | 8.8 | 10.6 | 10.8 | *10.1* |
| **Ninja** | 8.8 | 9.7 | 10.9 | *9.8* |
| ***Means*** | *8.7* | *10.1* | *10.7* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.65 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Hectolitre weight (kg/hL) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 76.1 | 74.7 | 74.8 | *75.2* |
| **Trojan** | 79.8 | 77.3 | 75.9 | *77.6* |
| **Devil** | 76.3 | 73.4 | 72.4 | *74.0* |
| **Ninja** | 75.4 | 74.4 | 72.6 | *74.1* |
| ***Means*** | *76.9* | *74.9* | *73.9* |  |
|  | Significance (Variety) P = 0.0002 | | l.s.d (P<0.05) = 1.53 | |
|  | Significance (Decile) P = 0.0004 | | l.s.d (P<0.05) = 1.33 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Screenings (%) wheat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Scepter** | 6.9 | 7.7 | 8.3 | *7.6* |
| **Trojan** | 7.4 | 14.2 | 17.9 | *13.2* |
| **Devil** | 5.6 | 11.1 | 12.0 | *9.6* |
| **Ninja** | 7.5 | 9.4 | 12.2 | *9.7* |
| ***Means*** | *6.9* | *10.6* | *12.6* |  |
|  | Significance (Variety) P = 0.0009 | | l.s.d (P<0.05) = 2.41 | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 2.08 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

***BARLEY***

Table 1: Crop emergence (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.7 | 8.3 | 7.3 | *8.1* |
| **Buff** | 8.7 | 9.0 | 8.0 | *8.6* |
| **Spartacus** | 7.7 | 7.7 | 8.7 | *8.0* |
| **Planet** | 8.0 | 8.7 | 9.0 | *8.6* |
| ***Means*** | *8.3* | *8.4* | *8.3* |  |
|  | Significance (Variety) P = 0.043 | | l.s.d (P<0.05) = 0.50 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 2: Crop vigour (0-9) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 9.0 | 8.7 | 8.7 | *8.8* |
| **Buff** | 8.7 | 9.0 | 8.0 | *8.6* |
| **Spartacus** | 7.3 | 8.0 | 8.0 | *7.8* |
| **Planet** | 8.3 | 9.0 | 8.3 | *8.6* |
| ***Means*** | *8.3* | *8.7* | *8.3* |  |
|  | Significance (Variety) P = 0.010 | | l.s.d (P<0.05) = 0.60 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 3: NDVI reading barley 8 August 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.54 | 0.49 | 0.48 | *0.50* |
| **Buff** | 0.61 | 0.52 | 0.56 | *0.56* |
| **Spartacus** | 0.51 | 0.48 | 0.53 | *0.51* |
| **Planet** | 0.50 | 0.51 | 0.43 | *0.48* |
| ***Means*** | *0.54* | *0.50* | *0.50* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 4: NDVI reading barley 6 September 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 0.62 | 0.68 | 0.62 | *0.64* |
| **Buff** | 0.67 | 0.70 | 0.71 | *0.69* |
| **Spartacus** | 0.68 | 0.70 | 0.67 | *0.68* |
| **Planet** | 0.69 | 0.69 | 0.70 | *0.69* |
| ***Means*** | *0.67* | *0.69* | *0.67* |  |
|  | Significance (Variety) P = 0.032 | | l.s.d (P<0.05) = 0.041 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 5: Yield (t/ha) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 3.29 | 3.39 | 2.85 | *3.18* |
| **Buff** | 3.23 | 3.51 | 3.06 | *3.27* |
| **Spartacus** | 3.76 | 3.13 | 3.38 | *3.43* |
| **Planet** | 3.34 | 3.64 | 3.33 | *3.44* |
| ***Means*** | *3.41* | *3.42* | *3.16* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 6: Protein (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 8.8 | 10.3 | 10.2 | *9.8* |
| **Buff** | 8.9 | 10.4 | 11.3 | *10.2* |
| **Spartacus** | 10.0 | 10.3 | 10.9 | *10.4* |
| **Planet** | 9.2 | 11.0 | 10.4 | *10.2* |
| ***Means*** | *9.2* | *10.5* | *10.7* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P <0.001 | | l.s.d (P<0.05) = 0.59 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 63.4 | 62.5 | 61.9 | *62.6* |
| **Buff** | 64.6 | 63.0 | 73.9 | *67.2* |
| **Spartacus** | 64.9 | 64.2 | 63.9 | *64.3* |
| **Planet** | 64.2 | 69.4 | 58.8 | *64.1* |
| ***Means*** | *64.2* | *64.7* | *64.6* |  |
|  | Significance (Variety) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 63.4 | 61.0 | 60.9 | *61.8* |
| **Buff** | 57.7 | 57.3 | 56.7 | *57.2* |
| **Spartacus** | 63.2 | 60.4 | 60.1 | *61.2* |
| **Planet** | 54.7 | 54.5 | 56.1 | *55.1* |
| ***Means*** | *59.7* | *58.3* | *58.5* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 1.54 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 45.7 | 64.4 | 55.6 | *55.2* |
| **Buff** | 41.9 | 51.2 | 37.6 | *43.6* |
| **Spartacus** | 42.7 | 44.9 | 56.0 | *47.8* |
| **Planet** | 64.7 | 70.3 | 61.6 | *65.6* |
| ***Means*** | *48.8* | *57.7* | *52.7* |  |
|  | Significance (Variety) P = 0.0003 | | l.s.d (P<0.05) = 9.21 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 10: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 54.3 | 35.6 | 44.4 | *44.8* |
| **Buff** | 58.1 | 48.8 | 62.4 | *56.4* |
| **Spartacus** | 57.3 | 55.1 | 44.0 | *52.2* |
| **Planet** | 35.3 | 29.7 | 38.4 | *34.4* |
| ***Means*** | *51.2* | *42.3* | *47.3* |  |
|  | Significance (Variety) P = 0.0003 | | l.s.d (P<0.05) = 9.21 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 7: Colour barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 62.4 | 61.5 | 61.0 | *61.6* |
| **Buff** | 61.6 | 60.5 | 60.1 | *60.7* |
| **Spartacus** | 64.0 | 62.5 | 62.4 | *63.0* |
| **Planet** | 58.3 | 57.9 | 57.7 | *58.0* |
| ***Means*** | *61.5* | *60.6* | *60.3* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 0.8 | |
|  | Significance (Decile) P = 0.004 | | l.s.d (P<0.05) = 0.7 | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 8: Hectolitre weight (kg/hL) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 65.9 | 65.7 | 65.5 | *65.7* |
| **Buff** | 66.3 | 66.1 | 66.1 | *66.1* |
| **Spartacus** | 67.6 | 67.0 | 66.7 | *67.1* |
| **Planet** | 67.5 | 66.6 | 67.3 | *67.1* |
| ***Means*** | *66.8* | *66.3* | *66.4* |  |
|  | Significance (Variety) P = 0.010 | | l.s.d (P<0.05) = 0.95 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 9: <2.5 mm screenings (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 66.7 | 74.8 | 72.6 | *71.4* |
| **Buff** | 41.9 | 39.5 | 40.6 | *40.7* |
| **Spartacus** | 51.9 | 60.2 | 57.1 | *56.4* |
| **Planet** | 71.8 | 75.4 | 75.1 | *74.1* |
| ***Means*** | *58.1* | *62.5* | *61.4* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 7.72 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

Table 10: Plump grain (%) barley

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Decile 1** | **Decile 4** | **Decile 7** | ***Means*** |
| **Rosalind** | 33.3 | 25.2 | 27.4 | *28.6* |
| **Buff** | 58.1 | 60.5 | 59.4 | *59.3* |
| **Spartacus** | 48.1 | 39.8 | 42.9 | *43.6* |
| **Planet** | 28.2 | 24.6 | 24.9 | *25.9* |
| ***Means*** | *41.8* | *37.5* | *38.6* |  |
|  | Significance (Variety) P <0.001 | | l.s.d (P<0.05) = 7.72 | |
|  | Significance (Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |
|  | Significance (Variety \* Decile) P = N.S. | | l.s.d (P<0.05) = N.A. | |

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