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Wheat and barley variety update 2018

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EXTENSION

Key messages
- **Across a wide sowing date range and mostly very dry and frosty seasonal weather conditions, mid-season maturing wheat and barley varieties were generally most dominant in 2018.**
- **Vixen (AH), Scepter (AH), Beckom (AH), LRPB Arrow (AH) and the Clearfield varieties, Razor**CLPLUS **(ASW) and Sheriff**CLPLUS **(APW), led Mace, and were the highest yielding varieties across 2018 SA wheat NVT sites.**
- **Rosalind, Fathom, Buff and RGT Planet led Compass and were the highest yielding varieties across 2018 SA barley NVT sites.**
- **Long term results at a local level, found at NVTonline. com.au, will provide the most reliable yield information to guide choice of variety for a particular farming system.**

2018 seasonal overview for cereal NVT

Much like 2017, the 2018 cropping season began with an erratic opening break for most districts with limited opportunities to sow early into adequate moisture and very delayed germination in many dry sown situations. Extremely low rainfall in most districts except the South East continued through winter and into spring and was combined with severe frost (stem and head) events during late August and September and into early October, particularly within districts which rarely see these events. Strong winds in late September and early October further impacted crop growth through grain shattering and lodging. On a more positive note, incidence of cereal disease was very low with some Septoria noted within the high rainfall South East district. Despite the very challenging season in many SA districts and the confounding issues across districts, the majority of cereal national variety trials (NVT) produced good results and provided the opportunity to assess many of the newer varieties under diverse albeit mostly drier seasonal conditions.

Wheat NVT

The light and erratic opening rains impacted the NVT program, preventing the opportunity to sow "early break" wheat trials except for a long season trial in the South East. Otherwise for main season trials, sowing dates ranging from 8 May at Piednippie to 20 June at Penong, with most trials sown in the second half of May. Individual wheat NVT site yields ranged from 0.31 t/ha at Mitchellville to 7.3 t/ha at Conmurra in the South East with an average of 2.92 t/ha across the 19 successful main season trials, slightly above the 2.72 t/ha average in 2017 but below the 5-year (2013-2017) average of 3.30 t/ha.

Trial variability, severe drought conditions and frost, resulted in the failure of trials at Kimba, Pinnaroo, Nangari, Wanbi, Palmer, Spalding and Wokurna. The results from these sites were considered invalid for 'head to head' variety comparisons, but for transparency, are available in a 'Quarantined Trials Report' obtained at NVTonline.com.au. All other trials returned statistically acceptable results.

A total of 38 commercial wheat varieties and 19 breeding lines were evaluated in the South Australian main season NVT series. Overall, the 2018 seasonal conditions tended to favour early to mid-maturing varieties with Vixen, Scepter, Beckom, Cobalt, LRPB Arrow, RazorCLPLUS and SheriffCLPLUS respectively leading all other varieties, including Mace, tested at all sites.

Many of these leading varieties have only been released in the past 12 months or more and while it is useful to see their performance in a difficult year like 2018, longer term comparisons including their quality and disease resistance characteristics need to be considered by growers considering a change to them. Of particular interest will be the new Clearfield varieties, Razor[CLPLUS] and Sheriff[CLPLUS] which potentially offer much higher yields and a range of alternative agronomic characteristics, albeit lower market quality classification, relative to the older commercial varieties, Grenade[CLPLUS] and Kord[CLPLUS].

Barley NVT

Within the main season 2018 barley NVT, sowing dates ranging from 8 May at Piednippie to 26 June at Darke Peak with most trials sown in the second half of May. Individual barley NVT site yields ranged from 0.84 t/ha at Lameroo to 7.07 t/ha at Maitland on the Yorke Peninsula with an average of 3.66 t/ha across the 15 successful main season trials, well below the 4.37 t/ha average in 2017 and below the 5-year (2013-2017) average of 4.04 t/ha.

Trial variability, severe drought conditions and frost, resulted in the failure of trials at Crystal Brook, Paruna and Wharminda. The results from these sites were considered invalid for 'head to head' variety comparisons, but for transparency, most results are available in a 'Quarantined Trials Report' obtained at NVTonline. com.au. All other trials returned statistically acceptable results.

A total of 35 commercial barley varieties and 15 breeding lines were evaluated in the South Australian main season NVT series. Overall, the 2018 seasonal conditions tended to favour early to mid-maturing varieties but across all sites, only six per cent difference in yield separated the top 12 varieties. Rosalind, Fathom, Buff,

RGT Planet and Compass were the leading varieties respectively followed by Hindmarsh, LaTrobe and Spartacus CL. With, the exception of Buff, a recent release with acid soil tolerance, this group of varieties have generally been among the best performers in SA barley NVT across recent seasons.

Interpreting long term yield data and NVT new developments

The long-term yield data presented in annually published crop sowing guides, is an output of the new National Variety Trials (NVT) Long Term Multi Environment Trial (MET) analysis and use a minimum five-year rolling dataset in the MET analysis.

A factor analytic (FA) mixed model approach is used in the MET analysis drawing on expertise from the GRDC supported Statistics for the Australian Grains Industry (SAGI) program. This approach uses raw plot data to simultaneously model the individual trial variation and the variety by environment interactions (VEI) observed across years and geographical locations to develop the NVT long-term variety by environment predictions. In this way, NVT long-term predictions better exploit the true power that exists within the NVT database which now encompasses over 8,000 individual trials.

To gain the full benefit of these world leading statistical outputs, users should study variety rankings across locations and seasons relevant to their farming system. However, presenting this level of detail is difficult within hardcopy publications which are left needing to average across regions and/or yield groupings. Averaging does simplify the data and allows for broad sweeping generalisations but also actually masks variety performance comparisons that might otherwise be observed for specific environments, effectively undoing the sophistication of the new analysis.

To overcome this challenge the NVT team have continued to develop a simple web tool for viewing the vast datasets encountered in the NVT system and it is available at https://app. nvtonline.com.au.

When using the tool, the results are most accurate and reliable when viewed at the individual location (site) level, but the option is still provided for regional or multi-site selections for ease of use and/or more generic interpretations. In addition, users can still choose to view data on Year or Yield based groupings, both in chart or table format and they can also filter wheat varieties by delivery classification.

Future outlook for NVT

With the increased sophistication afforded by the latest analytical and reporting techniques, an opportunity now exists to help growers understand and interpret the Variety x Environment Interactions (VEI) observed in NVT. In particular, research to better explain the environmental drivers of variety performance will assist growers more easily relate NVT results to their growing environment.

Finally, the wide range of variety trait information made available through NVT, supports more considered variety selection decisions, but again adds complexity. To enable growers to more easily navigate the selection process, the NVT team are investigating options for growers to select their user preferences with regard to sites, varieties and traits of interest.

Cereals