ANGUSSELECT™

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SUMMARY

A key practice for producers looking to increase their rate of genetic gain is the consistent application of a breeding objective to selection decisions. AngusSELECT™ enables users of Angus genetics to identify the animals that are most aligned with their breeding objective through an intuitive suite of decision support tools. This paper will showcase the functionality of the tools and provide analytics to demonstrate their use to identify Angus genetics that meet the breeding objectives of individual cattle breeders.

INTRODUCTION

Angus Australia is focussed on enhancing the value and profitability of Angus genetics throughout the beef supply chain by ensuring that its members, and their commercial customers, have access to world leading genetic evaluation technologies and associated tools for genetic improvement. Consistent with this focus, Angus Australia has developed decision support tools specifically tailored to the needs of its members.

AngusSELECT™

AngusSELECT™ (https://www.angusaustralia.com.au/angusselect) composes a suite of decision support tools which support breeders in identifying desirable genetics to include within their breeding program and improve the profitability of Angus genetics within the beef supply chain. These tools include; (i) SaleSELECT – search and sort the registered Angus animals that are currently available for sale and identify those animals that are most aligned with users' breeding goals and objectives; (ii) SemenSELECT – search and sort the registered Angus bulls for which semen is available and identify the most suitable genetics for use within users' artificial breeding programs; (iii) ASBPSELECT – search and sort the Angus bulls that have been entered in the Angus Sire Benchmarking Program and identify bulls carrying genetics that are suitable for use within users' breeding programs.

Entering selection criteria. The AngusSELECT™ decision support tools assist users in the application of breeding goals and objectives to selection candidates. The two-step selection tool assists users to select relevant catalogues and then apply selection criteria to identify animals which meet their requirements.

Selecting catalogues. Users have access to a multitude of ways to select catalogues within AngusSELECT™, which hosts sale, semen, embryo and ASBP sire catalogues, which users are able to refine with a number of intuitive search features. These features include: (i) selecting specific catalogues; (ii) specifying by region (only available in SaleSELECT); (iii) specifying within distance from a location (only available in SaleSELECT); (iv) specifying within postcode (only available in SaleSELECT); and, (v) specifying with the interactive map utilising the power of Google Maps and interfacing with locations of currently listed sale catalogues. This provides users a modern and convenient approach to identifying selection candidates in relevant geographic locations (only available in SaleSELECT).

Selecting candidates. Once users have identified the catalogue(s) to be filtered, the second step supports them in the application of selection criteria to the candidates that are available. Users can define selection criteria to filter the catalogues through a range of tabs including: (i) Animal details – sex, register, calving year, colour, has photo, has video, etc.; (ii) Breeding – Sire ID, exclude sire

ID, dam ID, etc.; (iii) Genetic Tests – parent verified, red gene, arthrogryposis multiplex (AM), contractual arachnodactyly (CA), developmental duplications (DD), neuropathic hydrocephalus (NH), etc.; (iv) EBVs and Indexes – birth weight (BWT), 400 day weight (400), carcase weight (CWT), intramuscular Fat (IMF), Angus Breeding Index (ABI) etc.

When users apply criteria relating to EBVs they have the option to set minimum or maximum breeding value thresholds or alternatively apply percentile band cut offs using an interactive slider bar. Regardless the level of selection pressure users choose to apply, the AngusSELECT suite of decision support tools will support them in their genetic selection decision.

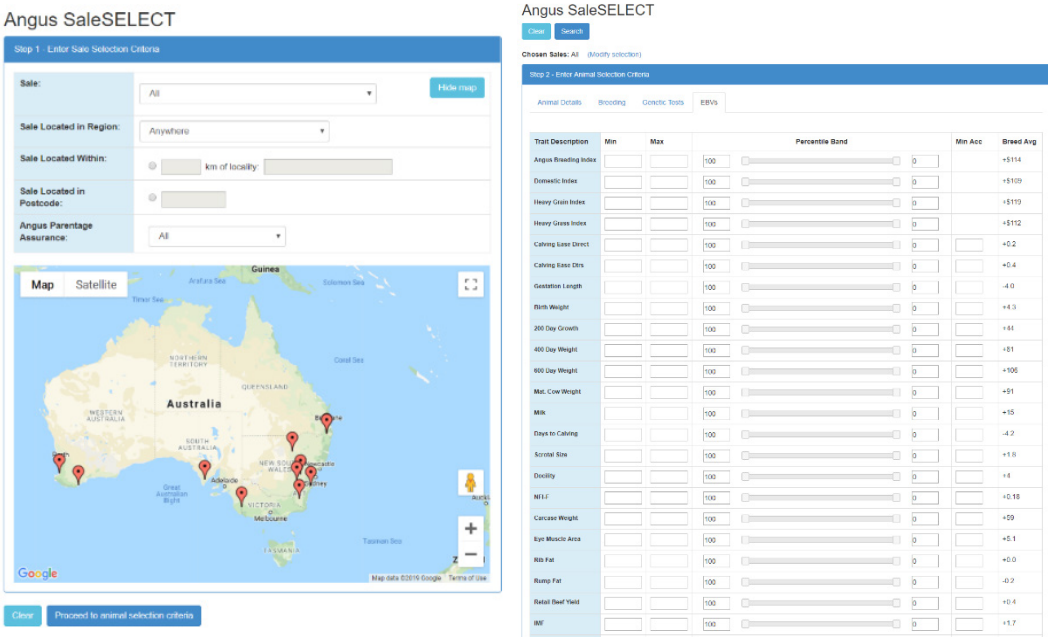

Figure 1. Interface for selecting catalogues of interest and displaying the EBV selection criteria users can apply to searches in SaleSELECT

Viewing candidate information. A comprehensive array of information is provided on animals meeting the search requirements. The information is displayed over a number of tabs specific to the listed animal, including: (i) Summary – a quick guide to the information stored on the Angus Australia database for the animal; (ii) Basic details – includes details as to the ID, name and tattoo of the animal, birth date, gender, mating type and registration status; (iii) Sale details - includes details around the sale of the animal or its semen; (iv) Ownership – includes details of the current ownership and ownership history of the animal; (v) Pedigree – an interactive tab enabling users to navigate through the pedigree of the animal; (vi) Progeny – includes details of any progeny of the animal; (vii) EBVs – includes the current EBVs for the animal in tabular form; (viii) EBV chart – displays the current EBVs for the animal in graphical form; (ix) Genetic results – includes the DNA testing results for the animal, including parentage verification and status for genetic conditions and traits; (x) Photos/ Videos – includes photos and videos of the animal.

A number of new concepts have been implemented to simplify the display of genetic information, including the display of percentile band information below each EBV, and a revised, more intuitive graphical display of EBV information via the EBV chart (Figure 2).

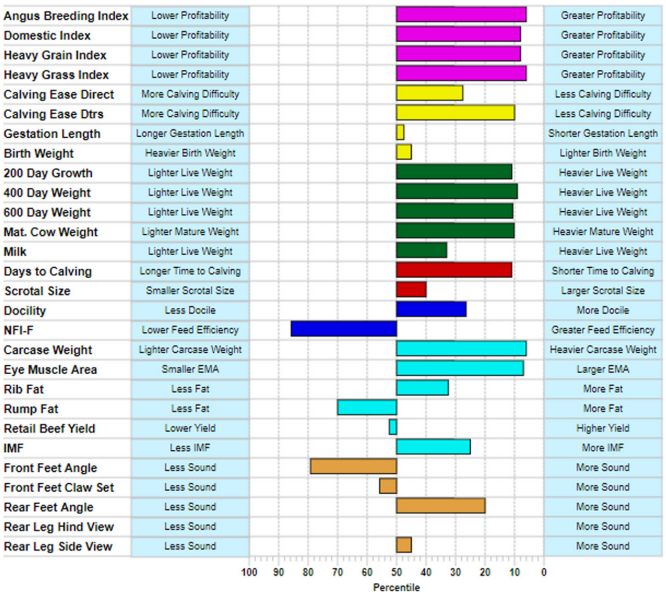

Figure 2. The EBV chart displays EBV information in an intuitive graphical display

Report Centre. In addition to viewing candidate information, an interactive report centre provides users with the ability to generate reports and analyse the results of any search that they have conducted. Specifically, users can: (i) download pdf reports and .csv files of search results in a format that is suitable for printing or importing into software programs such as Microsoft Excel; (ii) download pdf reports for individual animals in a print-friendly format; (iii) generate reports summarising the average, minimum and maximum EBVs for animals returned in a search; (iv) generate reports summarising the sires represented within the results of a particular search; (v) generate an interactive graph comparing the EBVs of animals returned in a search for two specific traits or selection indexes; (vi) generate an interactive graph summarising the distribution of EBVs of animals returned in a search for a specific EBV or selection index (Figure 3).

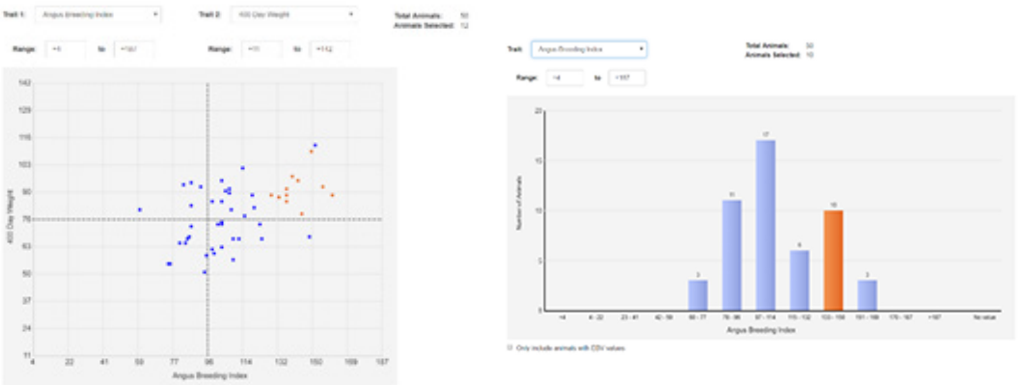

Figure 3. Two of the reports (trait comparison and trait distribution reports) available in the report centre of AngusSELECT™

USAGE OF AngusSELECT™

The initial 10 months following full implementation of AngusSELECT™ in November 2018 has highlighted a number of interesting trends around user queries. Usage of the tools has been high with an average of 15,794 catalogue searches a month, which cumulatively equated to 157,944 searches for the initial 10-month period (Figure 4).

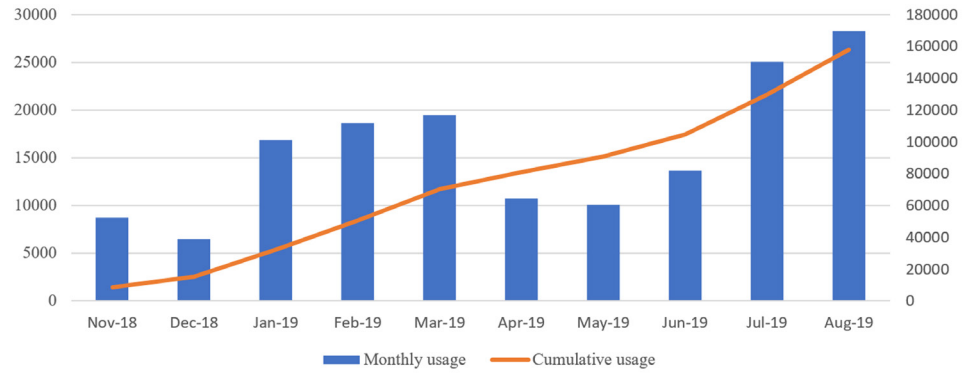

Figure 4. AngusSELECT™ catalogue searches by month and cumulative usage between November 2018 and August 2019

Angus.Tech is the software currently used to manage Angus Australia's extensive pedigree, performance and genomic database and encompasses AngusSELECT™ tools. With regards to the selection criteria applied to candidates, the IMF EBV has been the most searched EBV criteria across the Angus.Tech software, reporting over 1,800 more queries than the second and third most searched in birth weight and eye muscle area respectively (Table 1). The Angus Breeding Index was the most searched of the four available indexes.

Table 1. EBV Criteria used for searching within Angus.Tech between 1st November 2018 and 31st of August 2019

Criteria used for animal searches	Number of queries
Intramuscular Fat EBV	7,035
Birth weight EBV	5,211
Eye muscle area EBV	4,018
Angus breeding index	3,781
400 day weight EBV	3,672
200 day growth EBV	3,204
Mature cow weight EBV	3,185
600 day weight EBV	3,020
Heavy grain index	2,637
Calving ease direct EBV	2,547

CONCLUSION

Angus Australia's software development initiative delivers users a modern and intuitive range of decision support tools, in AngusSELECT™, to support them to increase their rate of genetic gain in the herds. Usage analytics indicate that the suite of AngusSELECT™ tools are being used to identify Angus genetics to meet breeding objectives of individual cattle breeders.