PIGBLUP Update

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Introduction

The releases of V5.20 in late 2005 and an update in March 2006 involved few enhancements to *PIGBLUP*'s capabilities other than Ron Crump's *PBMARKER* marker handling module and removed any discovered bugs. However, V5.20 contained internal changes which continued along the path to make *PIGBLUP* a generic BLUP analysis system and were a preparation for the considerably expanded capabilities of V6.00.

The V5.20 maintenance release in March 2006 contained several significant improvements:

- spline curve fitting of payment grid data in addition to (optionally weighted) quadratic curve fitting to give more accurate approximation of payment curves, and

- a correction to the calculation of reproduction trait genetic trends, which became noticeable when there had been high selection intensity on reproduction traits over a long period, and

- the capability to copy a CUSTOM.INX file containing EBV's from the Herd\Breed directory where the analysis was performed to another directory in preparation for uploading to a herd recording system. Also, to cater for herd recording systems which have not been updated to handle the *Extra Carcase Trait* introduced with V5.20, you can elect that the CUSTOM.INX copy be reverted to the V5.10 format automatically – provided the *Extra Carcase Trait* was not analysed in that analysis.

It is pleasing to note that V5.20 has proved to be remarkably stable with very few errors reported (which were fixed in the March 2006 maintenance release). Thanks for this are due to those clients who have noticed errors and supplied us with supporting information to assist in tracing and fixing the causes. All clients have benefited from their efforts.

The development of *PIGBLUP* continues and changes delivered in *PIGBLUP V6.00*, *PigCheck V6.00* and *Migrate V6.00* are detailed in the following sections.

PIGBLUP V6.00

The principal enhancement of this version is the considerable expansion in the number of Production and Carcase traits that *PIGBLUP* will be able to analyse. AGBU is currently testing *PIGBLUP* with an additional three (3) Production trait slots and six (6) Carcase trait slots. Thus, V6.00 will be programmed to simultaneously analyse eight (8) Production and ten (10) Carcase traits – as well as juvenile IGF1. The number of traits may be increased further should the need arise.

As a consequence of this expansion, some of the original internal structures have had to be re-designed and more efficient programming methods used. This has had an immediate benefit in the code being leaner due to removal of superseded code and noticeable speed gains in steps associated with accuracy calculation in particular. AGBU hopes to achieve fully dynamic handling of memory over the next few releases.

AGBU has taken the opportunity afforded by the expansion in the number of Production and Carcase traits and consequent necessity of defining data record slots for the new traits to define a new data format. The new format will not only cater for these new traits but also, in a consistent way, for additional traits in the future as the need arises. Also, the *user-defined management group* on each data record has been widened in format V3 to four (4) characters and additional space reserved for possible future enhancements.

Those users analysing data files from herds with different animal identification (ID) widths will at last be able to set the maximum width from the *Setup/Parameters* screen. The ID width in the *PBLUP.FIG* file will become the default ID width when a Herd/Breed directory is created and the *FARM1.INP* parameters file in the Breed directory will hold the editable ID width for that breed.

Once testing has been completed on the analysis and display of the expanded trait set, V6.00 will be modified to permit more flexible graphing and comparison of genetic and environmental trends. At present there are two ways of graphing genetic trends: *by traits within breed* and *by breeds within trait*. The new graphing capabilities are expected to include the ability to combine breeds and display herd within breed trends.

PigCheck V6.00

In addition to being able to check the data fields for the new Production and Carcase traits, *PigCheck* will permit the user to set the severity level of the various errors and selectively display error type categories. This will provide the user with much more control over the display of data errors and awareness of particular types of errors.

PigCheck V6.00 will provide phenotypic trends on the raw trait data. While phenotypic trends are deprecated as a guide to breeder selection they are appropriate as a data review tool – thus our intention to place this capability within *PigCheck* rather than *PIGBLUP*.

Migrate

Migrate has been updated to migrate *PIGBLUP* versions V5.00 through to V5.20 to version V6.00. With the expanded trait set of V6.00 and consequent extensive changes to trait definition, genetic parameter, limits etc files, Migrate has been an absolute necessity for efficient testing V6.00 against V5.20 test cases.

With V5.20, *Migrate* no longer migrated *PIGBLUP* versions prior to V5.00. As the effort in catering for the migration of very old versions is considerable – in addition to the time involved testing Migrate against all of these versions - *PIGBLUP* versions subsequent to V6.00 will only migrate from V5.20 and V6.00. Thus, those using older versions of *PIGBLUP* will have to migrate to V5.20 or V6.00 prior to migrating to post V6.00 versions.

Migrate for V5.20 was the first version to be able to migrate an installed prior version of *PIGBLUP* without the need for subsequent minor final editing by the user. *Migrate V6.00* has maintained that capability.

Summary

PIGBLUP V6.00 users will be able to base selection decisions on a much larger set of Production and Carcase traits than previously. New program structures have been used to increase *PIGBLUP*'s capacity to handle larger data files and trait sets. In addition, graphical display will be enhanced in both *PIGBLUP* and *PigCheck*.