Problems encountered by PIGBLUP users

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Introduction

There are a variety of problems that PIGBLUP users report. Many of these are specific to their computer set-up and are never reported by another user. This results from the interaction of PIGBLUP (a DOS-based program) with Windows (many versions and even more configurations) and the vast range of computer hardware.

The purpose of this paper is to outline some of the areas in which problems have been reported recently.

Memory problems

1. Setting the MS-DOS memory properties

It is very important that the MS-DOS memory properties are configured as in the PIGBLUP Manual. There are two areas where problems with these settings have been reported: being unable to start the program at all and the program being unable to detect the environment variables.

Traditionally, MS-DOS allows 640kb of memory to a program and even small versions of PIGBLUP require much more than this. If the program cannot get sufficient memory, it will not run. You may be asked to run it in MS-DOS mode (ie to re-boot in MS-DOS rather than Windows). To overcome this limitation, the MS-DOS protected mode (DPMI) memory setting must be set to 65535. This is the maximum permissible value and must be typed in (it is not available from the pull-down list).

There is a small amount of memory set aside in your computer to hold environment variables. It is possible that you will have more environment variables than will fit in this piece of memory, causing some of them not to be available for use. For this reason, the recommended value for the MS-DOS memory properties "Initial Environment" setting is 2048kb. If you run a lot of programs that rely on environment variables, you may even exceed the 2048kb initial environment memory. In this case, increase it further.

2. Your version of PIGBLUP is too big for your computer's memory

If there is insufficient random access memory (RAM) on your computer to allow PIGBLUP to run under Windows, even with the required MS-DOS memory settings in place, re-booting in MS-DOS mode may be the solution. There are two reasons for this; the computer requires much less memory to run MS-DOS than to run Windows, leaving a larger proportion for PIGBLUP to use, and in MS-DOS mode the Lahey memory manager is used and this is more capable than the Windows one.

Interactions with the operating system

Because there are many versions and configurations of Windows 95, 98 and NT in use, problems can arise that we cannot test for prior to the release of a PIGBLUP version. Two examples are outlined below.

1. Case sensitivity in DOS

Some users with new machines have reported that the environment variables (ie the directory and path names set in c:\autoexec.bat) have now become case sensitive.

This problem will be seen when PIGBLUP fails to find the appropriate files, despite the environment variables appearing to be correctly set. The solution to this, if you observe it, is to type your environment variables in c:\autoexec.bat with exactly the same combination of upper- and lower-case letters that you used when creating the installation directory. Then re-boot the computer so that those settings are picked up.

2. PIGBLUP will not run under Windows NT

PIGBLUP runs perfectly on the Windows NT machine in AGBU, and so we have been unable to fully investigate the problem observed by other NT users. However, we have recently been alerted to a new driver that appears to fix the problem. We have now borrowed an NT machine that PIGBLUP fails on, on which this fix can be tested and verified.

Data errors

Any genetic evaluation can only be as good as the data that is provided. Whilst recognising this, the example below is more concerned with the way in which the data can cause the program to malfunction, or fail all together.

1. Flagging active animals

PIGBLUP creates EBVs for "active" animals and all animals that have had offspring at any time. Active animals are those available for selection or mating. PIGBLUP attempts to identify these automatically using a limit on the animal's age.

PIGBLUP data files contain a field for the "manual" flagging of active animals. This allows selected animals that are not yet parents and are too old to be automatically flagged as active by the program to get updated EBVs. The provision of this field is a useful facility, but if too many animals are flagged, they can cause a problem.

There is a limit on the number of animals that can be analysed, this is related to the size of your herd and hence to your licence. If you, or your herd recording software, flag an excessive number of animals as active or fail to un-flag inactive animals this limit can be exceeded casing PIGBLUP to fail.

2. Inappropriate use of valid data flags

If an animal has an extreme record for a trait that is known to be correct the user can flag that record in order that it does not get discarded during the data preparation process.

Inappropriate use of valid flags for records is commonplace. Often all records are flagged as valid automatically by the herd recording software. Unless vigorous checks are being made, this in not the right thing to do. While it is not a program problem, it is a problem seen in many data sets that we receive. It will result in poor evaluation results, bad selection decisions and sub-optimal genetic response.

Misconceptions about PIGBLUP functions

Some reported problems are the result of the user expectations not matching the actual calculations in PIGBLUP.

1. Normalised user-defined index does not have the expected variance

A user-defined index can be adjusted to have a user-specified mean and variance. This tool was included to fulfil the legal requirements for the presentation of EBVs in certain countries.

A problem report came in from a user who calculated the variance of the normalised user-defined index values from PIGBLUP and found it to be much less than the value specified.

Within PIGBLUP, the genetic variance of the user-defined index is scaled to be the user-specified value. However, that does not mean that the index EBVs output by PIGBLUP will have that variance. That would only be the case if the EBVs were known without error (ie, they were the true breeding values). The variance of the index EBVs is reduced because we do not have perfect information about the genetic merit of the animals.

Bugs in PIGBLUP

PIGBLUP is not a bug-free system. The program is so complex and has so many options that all possible combinations cannot be tested within a realistic budget. As a result, real bugs are still being found, both in new and old code. We greatly appreciate the time spent by users in identifying these problems, describing them and, often, providing us with the data sets and other files required to reproduce and fix them.

It is our aim that PIGBLUP improves with each release, and that fewer bugs are added than removed.

We hope that with version 4.20 and the previous released version 4.10 we have removed a number of bugs in setting up and analysing the data, at the same time as adding new and valuable features.

To aid with the migration to new versions, and help to eliminate some of the problems which arise, a new program, MIGRATE, will be included with the PIGBLUP version 4.20 release.