

# Merino bloodlines: a comparison based on wether trial results 2007–2018

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KL Egerton-Warburton, SI Mortimer, MA Sladek, LM Stephen and BCD Wilson

## Summary

The relative performance of commonly used Merino bloodlines has been updated with the 2018 analysis of 25 wether trials conducted in NSW (24) and Tasmania (1) between 2007 and 2018.

The 2007 – 2018 Merino Bloodline Performance information is presented as follows:

- Table 1 summarises the wether comparisons included in this analysis.
- Table 2 describes the traits presented in Table 3.
- Table 3 reports 73 bloodlines for nine individual traits, four financial performance indicators and accuracy of results.
- Figure 1 depicts the clean fleece weight and fibre diameter performance of each bloodline listed in Table 2 as a deviation from the mean of all bloodlines.
- Figure 2 shows the range in liveweight against fibre diameter (as deviations) of the 73 bloodlines.
- Figure 3 shows the performance of (a) staple length, (b) staple strength, (c) style and (d) colour against fibre diameter.

- Figure 4 depicts the deviations in financial performance of the bloodlines, calculated as \$/head (\$/hd), against fibre diameter.
- Figure 5 represents the deviations in financial performance of the bloodlines, calculated as \$/dry sheep equivalent (\$/DSE), against fibre diameter.
- Figure 6 shows the deviations in financial performance (\$/DSE) against clean fleece weight.
- Figure 7 represents the deviations in financial performance (\$/DSE) against liveweight.

## How the information is reported

The relative performance of 73 bloodlines involved in wether comparisons are provided for clean fleece weight, fibre diameter, liveweight and both objectively measured (staple length and staple strength) and subjectively assessed wool quality traits (style and colour). Simulation modelling using Grassgro™ generated two measures of financial performance of the bloodlines, expressed on a \$/head and \$/DSE basis. A measure of the variability in financial performance of the bloodlines has been included in the 2018 analysis. The standard deviation of profit provides an indication of the variation around the average profit of a bloodline on both a \$/hd and \$/DSE basis.

The 73 bloodlines reported in this Primefact have information that is of medium (27 bloodlines) or high (46 bloodlines) accuracy. Only those bloodlines with a standard error of less than 3% for clean fleece weight are reported, which ensures the reliability of the relative performance of each bloodline.

The previous 2006 - 2016 analysis (Primefact 1472), reported data from 26 trials with 66 medium and 11 high accuracy bloodlines. Compared with the previous analysis, there are 65 common and 8 new bloodlines represented in the 2018 analysis

## The Genetic Differences

The relative performance of each of the teams of sheep in the different wether trials is a combination of the genetics of the sheep and the environment. For any group of sheep, the performance we can see and measure (the phenotype) is a result of their genetics and the environment in which they have been raised. This is represented by the following equation:

$$\text{Phenotype} = \text{Genetics} + \text{Environment}$$

The Merino Bloodline Performance analysis removes the differences in environment both between years in a trial and between trials. Bloodlines with multiple teams, both within and across trials, provide the linkage that allows variation between trials and across years within a trial to be accounted for, leaving only the genetic differences between bloodlines.

### Clean fleece weight vs. fibre diameter

The distribution of bloodlines based on clean fleece weight and fibre diameter is depicted in Figure 1.

Each bloodline is represented by a code that can be matched with the bloodline name in Table 3 (arranged in alphabetical order).

The average values for clean fleece weight and fibre diameter for the bloodlines from the 2018 analysis were 4.2 kg and 18.4  $\mu\text{m}$  respectively. Note that it is not advisable to

use these average values to define bloodline performance as the actual performance of a bloodline for clean fleece weight and fibre diameter will vary according to the environment in which the sheep are run.

There was a strong relationship between clean fleece weight and fibre diameter across bloodlines (Figure 1). For finer bloodlines (FD < 18.4  $\mu\text{m}$ ), clean fleece weight tended to increase by 6% for each micron increase in FD; while for fine medium bloodlines (FD > 18.4  $\mu\text{m}$ ), clean fleece weight tended to increase by 1% for every micron increase in FD. However, there was significant genetic variation in clean fleece weight across the fibre diameter range. This genetic variation between bloodlines in clean fleece weight provides producers with two key options to use when evaluating one or more bloodlines depending on the breeding objective of their commercial flock:

1. a finer bloodline can be chosen that will reduce fibre diameter without compromising clean fleece weight, or;
2. a bloodline with heavier clean fleece weight can be chosen while maintaining fibre diameter at the current level.

### Liveweight vs. fibre diameter

There was a 13% difference in liveweight between the lightest (-7%) and heaviest (+6%) bloodlines, with an overall average of 58.7 kg. Finer bloodlines tend to have lower liveweight than broader bloodlines, with liveweight increasing by 1.6 kg for each micron increase in fibre diameter. However, there was significant genetic variation in liveweight at a given fibre diameter (Figure 2).

This indicates that at a given fibre diameter, it is possible for producers to select bloodlines with heavier liveweight if that is a component of their breeding objective.

### Wool quality vs. fibre diameter

Differences between the bloodlines in staple length, staple strength, style and colour are presented in Table 3. The average staple length and staple strength were 97.2 mm and 34.7 N/ktex respectively. The average style was 2.4, which is representative of good or MF5 style. The average colour was 1.2, indicative of little to no colour evident in the fleece.

The general relationship between fibre diameter and staple length suggests an increase in SL of 3.3 mm for every micron change in FD. For style, there is a 0.13 unit increase for each micron increase in FD, and for colour there is a 0.06 unit change per micron change in FD. There was no significant relationship between staple strength and fibre diameter.

There was evidence of significant genetic variation in both staple length and staple strength at a given fibre diameter (Figures 3 a & b). This means that for a given fibre diameter there is scope for producers to choose a bloodline with increased staple length and/or strength to complement their particular breeding objective.

For the 73 bloodlines analysed, there was less genetic variation in either style or colour at a given fibre diameter (Figures 3 c & d). Therefore, the choice of bloodline will have little influence on either the style or colour that is able to be achieved.

### Bloodline Financial Performance

The financial performance of each bloodline was determined using the GrassGro™ decision support tool. GrassGro™ uses historical daily weather data to drive models of interacting pasture growth and animal production, with day-to-day changes in the water content of the soil, pasture growth and decay, and responses to grazing simulated for a particular location.

The greasy fleece weight, yield, fibre diameter and liveweight for each of the 73

bloodlines provided the livestock production parameters for 73 GrassGro™ simulations. The same farm system was used for each simulation, with parameters for soil, pasture and weather provided by a site at Bookham, near Yass, in NSW.

Enterprise structure, prices and costs were held constant for all simulations and were reflective of a wether enterprise at Bookham, with wethers shorn three times and then sold.

The simulations ran from 1963 to the end of 2017, providing a quantitative assessment of the performance of each bloodline across the full spectrum of seasonal conditions from drought through to long wet years.

The stocking rate (7.8 wethers/ha) used in the GrassGro™ simulations for all bloodlines was chosen such that the bloodline with the median liveweight would achieve the rule of maintaining a minimum ground cover of 70% in 71% of the years. This ground cover rule ensured the sustainability of the pasture over the long term. As the bloodlines were run at the same stocking rate, there was a difference in ground cover of 5%. Bloodlines with lower liveweight had higher ground cover, with the heavier bloodlines the lower ground cover.

Median wool and mutton prices for the 5 years from 2013 to the end of 2017 were used to determine the financial performance of each bloodline as this provided a better indication of the prices likely to be achieved by producers than the average wool and mutton prices. The median wool prices for that time period are presented below

| Fibre diameter | Median price |
|----------------|--------------|
| 16             | 1590         |
| 17             | 1487         |
| 18             | 1438         |
| 19             | 1356         |
| 20             | 1317         |
| 21             | 1301         |

and the median mutton price used was 338c/kg carcass weight. Changes in the wool and mutton prices would have an impact on the bloodline rankings.

### Measures of financial performance

GrassGro™ outputs include profit per head (\$/hd), per hectare (\$/ha) and per dry sheep equivalent (\$/DSE). Each of these outputs includes typical enterprise costs and an overhead cost per hectare calculated by the program for the environment in which the simulations were run. As the same stocking rate was used for each of the 73 GrassGro™ simulations, the \$/hd and \$/ha outputs are essentially the same.

The two measures of financial performance of the bloodlines reported here are:

- *profit per head (\$/hd)* which partially accounts for differences in liveweight between bloodlines as GrassGro™ allocates more supplementary feed to those bloodlines with higher liveweight to maintain the required minimum condition score of 1.5.
- *profit per dry sheep equivalent (\$/DSE)* which accounts for the impact that differences in liveweight will have on grazing pressure. The DSE rating calculated by GrassGro™ over the 55 years of simulations is based on the consumption of feed for a given liveweight and fleece production. Profit per DSE is calculated as follows:

$$\frac{\$/hd}{DSE \text{ rating}}$$

Figure 4 shows the bloodline distribution of profit/hd against fibre diameter, while Figure 5 depicts the relationship between profit/DSE and fibre diameter. Figure 6 presents profit/DSE against clean fleece weight, while the bloodline deviation in profit/DSE against liveweight is presented in Figure 7.

GrassGro™ was also used to estimate the financial performance for each of the 73 bloodlines using soil and pasture parameters for two other sites, Armidale and Narrandera (both in NSW). This was undertaken to explore the impact of location on the relative financial performance of the bloodlines. For the 2016 analysis, the correlations between profit per head (\$/hd) and profit per DSE (\$/DSE) among the 3 sites ranged from 98% to 99% with many of the bloodlines retaining their ranking across the three sites. Similarly for the 2018 analysis, despite large differences in the environment between these three sites, the relative financial performance of the bloodlines was similar.

For the 2018 analysis, the standard deviation of each of the two measures of profit was calculated. These are presented in Table 3. The standard deviation provides an indication of the amount of variation around the average profit (both per head and per DSE) for each of the 73 bloodlines over the 55 years of GrassGro™ simulations. A large standard deviation indicates greater variation in profit compared with a smaller standard deviation.

The financial performance of the 73 bloodlines at each of the three sites, Bookham, Narrandera and Armidale, together with the standard deviation of profit (\$/hd and \$/DSE), for the median price as well as low (30 percentile) and high (70 percentile) market scenarios can be found on the Merino Bloodline Performance website:

[www.merinobloodlines.com.au](http://www.merinobloodlines.com.au)

## Limitations

The information generated by the Merino Bloodline Performance analysis provides an objective comparative evaluation of the genetic variation between Merino bloodlines. It is a useful tool to aid decision making by wool producers in choosing alternative bloodline sources that match the breeding objectives of their commercial flocks. However, the limitations of the information need to be recognised:

- The financial performance reported in this Primefact is based on a wether enterprise shorn 3 times times and sold as mutton.
- Merino Bloodline Performance information is historic as the database for this report was restricted to comparisons that commenced within the past 11 years. Therefore, the relative performance of each bloodline represents the breeding policies of that stud and their commercial clients 5 to 15 years ago. Recent changes in breeding objectives or practices at the stud and commercial level will not be reflected in this information
- Differences in the number of teams representing each bloodline and the accuracy of each bloodline's performance information are listed in Table 3. Making decisions on alternative bloodlines of MODERATE accuracy will involve a slightly higher risk than those of HIGH accuracy.
- All teams included in this analysis were selected according to the guidelines set out in *Designing and conducting Merino wether comparisons and on-farm genetic evaluations*. This limits the ability of wether trial entrants to specifically select sheep for the trials and assists stud breeders and each of the wether trials contributing data to this analysis to define a team from an entrant's flock as

being representative of a particular bloodline.

- This analysis is unable to account for whether the teams have come from the bloodline's ram breeding flock or from their commercial clients. A high proportion of teams from higher merit flocks may occur when the stud's own commercial flock provides the majority of the teams which make up the bloodline result. We recommend that producers ask their stud whether the teams representing that bloodline were from the stud's own flock or their commercial clients.
- The relative financial performance of the bloodlines do not account for any variation between bloodlines in reproductive performance.

When using the information presented in this Primefact to evaluate one or more bloodlines it is important to contact the stud representing each bloodline directly and seek information that describes their bloodline's breeding program.

## Further information

Not all traits measured or assessed by some of the wether trials contributing data to this project are included in this Primefact. These include meat traits, face cover, wrinkle development and fleece rot. Producers should make contact with the NSW DPI staff below for access to this information. Some of these traits are evaluated at Merino sire evaluation sites. Reports from these sites can be accessed from the Australian Merino Sire Evaluation Association's (AMSEA) Merino Superior Sires website or via the Sheep Genetics MERINOSELECT website.

Merino Bloodline Performance information complements the Australian Sheep Breeding Values (ASBVs) provided by MERINOSELECT that predict the genetic merit of individual sheep and stud averages.

## Trials included in this analysis

Bloodline data used in this analysis were sourced from wether comparisons that had been run for a minimum of two years (50% of comparisons), and a maximum of three years (Table 1).

**Table 1 The 25 wether comparisons included in this analysis**

| <b>Trial name</b>                           | <b>State</b> | <b>Trial years</b> |
|---|--------------|--------------------|
| ANFD Schute Bell 2005-2007                  | NSW          | 2005-2007          |
| Bathurst 2005-2006                          | NSW          | 2005-2006          |
| Midlands Agricultural Association           | TAS          | 2006-2007          |
| Alectown                                    | NSW          | 2007-2008          |
| Armour                                      | NSW          | 2005-2007          |
| Glen Innes 2005-2007                        | NSW          | 2005-2007          |
| ANFD Schute Bell 2008-2010                  | NSW          | 2008-2010          |
| Bookham Agricultural Bureau 2008-09         | NSW          | 2008-2009          |
| Paling Yards, Taralga                       | NSW          | 2009-2010          |
| Merrimba                                    | NSW          | 2009-2010          |
| Peter Westblade Memorial Merino Challenge   | NSW          | 2011-2012          |
| Bathurst 2009-2011                          | NSW          | 2009-2011          |
| Bookham Agricultural Bureau 2011-2013       | NSW          | 2011-2013          |
| Glen Innes 2009-2011                        | NSW          | 2009-2011          |
| Parkes 2010-2012                            | NSW          | 2010-2012          |
| Peter Westblade Memorial Merino Challenge 2 | NSW          | 2013-2014          |
| Monaro 2012-2014                            | NSW          | 2012-2014          |
| Bathurst 2013-2015                          | NSW          | 2013-2015          |
| Northern Tablelands 2013-2015               | NSW          | 2013-2015          |
| ANFD Schute Bell 2013-2015                  | NSW          | 2013-2015          |
| Peter Westblade Memorial Merino Challenge 3 | NSW          | 2015-2016          |
| Bookham Agricultural Bureau 2015-2017       | NSW          | 2015-2017          |
| ANFD Schute Bell 2016 - 2018                | NSW          | 2016-2018          |
| Northern Tablelands 2016-2018               | NSW          | 2016-2018          |
| Peter Westblade Memorial Merino Challenge 4 | NSW          | 2017-2018          |

**Table 2 Explanation of the headings used in Table 3**

| Table heading    | Explanation   |
|------------------|---|
| Bloodline        | The bloodline nominated by the entrant of each team in the individual wether trials.  |
| Code             | Number used to locate a bloodline in the accompanying figures.  |
| CFW & LWT        | Clean fleece weight (CFW) and liveweight (LWT) reported as the percentage deviation from the average of all bloodlines reported in this analysis. When interpreting the table, do not add percentage deviation (as an absolute value) to the average as this does not generate the correct value for the bloodline. See footnote at bottom of Table 2 for more details. |
| FD, YLD and FDCV | Fibre diameter (FD in $\mu\text{m}$ ), yield (YLD in %) and coefficient of variation in fibre diameter (FDCV in %) reported as deviations from the average.   |
| SL               | Staple length reported as a deviation from the average in mm.   |
| SS               | Staple strength reported as a deviation from the average in N/ktex.   |
| STYLE            | Wool style – spinners (MF3), best (MF4), good (MF5), average (MF6) and inferior (MF7) grades (coded 1 to 5 respectively). Reported as deviation from the average. For more information go to <a href="http://www.awex.com.au/standards/awex-id-appraisers/">http://www.awex.com.au/standards/awex-id-appraisers/</a>  |
| COL              | Fleece colour – no colour, light unscourable and medium unscourable grades (coded 1 to 3 respectively). Reported as deviation from the average. For more information go to <a href="http://www.awex.com.au/standards/awex-id-appraisers/">http://www.awex.com.au/standards/awex-id-appraisers/</a>  |
| Profit \$/hd     | GrassGro™ financial performance from simulations over 55 years reported as the average operating profit on a dollar per head (\$/hd) basis.   |
| St dev \$/hd     | The standard deviation of profit (\$/hd) which indicates the amount of variation around the average operating profit per head. A larger standard deviation indicates greater variation in profit.   |
| Proft \$/DSE     | GrassGro™ financial performance from simulations over 55 years reported as the average operating profit on a dollar per dry sheep equivalent (\$/DSE) basis.  |
| St dev \$/DSE    | The standard deviation of profit (\$/DSE) which indicates the amount of variation around the average operating profit per DSE. A larger standard deviation indicates greater variation in profit.   |
| No. of teams     | The number of wether teams representing the bloodline in the analysis. Bloodlines can be represented by teams from the ram breeding flock itself and/or by clients' teams.  |
| No. of records   | The number of records for a bloodline. This includes repeated evaluation of the same sheep.   |
| ACC              | Accuracy: H = High accuracy (the standard error for CFW is less than 2%), M = Medium accuracy (the standard error for CFW is between 2% and 3%).  |

A blank in any column in Table 2 indicates that there was not any data available for the particular trials in which the bloodlines were represented.

Merino Bloodline Performance: a comparison based on wether trial results 2007 - 2018

**Table 3 Bloodline performance for key production traits, components of wool type and financial performance for the 73 bloodlines**

| Bloodline               | Code | CFW (%)       | LWT (%)        | FD (µm)        | YLD (%)       | FDCV (%)      | SL (mm)        | SS (N/ktex)        | STYLE      | COL        | Profit \$/hd       | St dev \$/hd       | Profit \$/DSE       | St dev \$/DSE      | No. of Teams | No. of Records | ACC |
|-------------------------|------|---------------|----------------|----------------|---------------|---------------|----------------|--------------------|------------|------------|--------------------|--------------------|---------------------|--------------------|--------------|----------------|-----|
| A.M.S                   | 1    | -11.1         | 1.7            | -0.6           | -2.8          | -1.6          | 1.4            | 5.1                | 0.03       | 0.07       | 40.41              | 14.39              | 24.13               | 8.59               | 2            | 60             | M   |
| Alfoxton                | 2    | -9.7          | -3.8           | -0.9           | -1.1          | -1.4          | -5.2           | 3.2                | -0.04      | -0.07      | 39.91              | 13.59              | 24.88               | 8.47               | 7            | 204            | H   |
| AMM                     | 3    | -6.6          | 0.4            | 1.1            | 1.6           | -1.3          | 6.6            | 6.2                | 0.09       |            | 36.64              | 14.40              | 22.15               | 8.71               | 3            | 86             | H   |
| Avonside                | 4    | -0.4          | -3.7           | -0.2           | -0.4          | 0.8           | -1.7           | -2.1               | 0.10       | -0.03      | 43.50              | 13.66              | 27.04               | 8.49               | 5            | 196            | H   |
| Barrackville            | 5    | -6.6          | -2.0           | -0.1           | -1.2          | -1.0          |                |                    | -0.05      |            | 39.80              | 13.58              | 24.42               | 8.34               | 2            | 50             | M   |
| Blink Bonnie            | 6    | 1.9           | -0.1           | 0.3            | 0.8           | 0.2           | 0.9            | -2.3               | 0.06       | -0.03      | 43.38              | 14.47              | 26.21               | 8.74               | 5            | 155            | H   |
| Bobingah                | 7    | 2.3           | -4.5           | -0.4           | -0.3          | 1.2           | 8.5            | -10.3              | 0.05       | -0.01      | 46.09              | 13.89              | 28.78               | 8.67               | 2            | 90             | M   |
| Bogo                    | 8    | -1.7          | 0.2            | -0.6           | -0.8          | -0.4          | 2.1            | 4.0                | -0.09      | -0.06      | 45.17              | 14.60              | 27.25               | 8.81               | 23           | 684            | H   |
| Bundilla                | 9    | 2.7           | 4.5            | 0.6            | -1.8          | 0.0           | 6.2            |                    | 0.11       | 0.11       | 46.50              | 16.17              | 27.13               | 9.43               | 3            | 88             | H   |
| Bungoona                | 10   | 1.8           | 0.8            | 0.4            | 3.4           | -0.5          | 2.0            | 0.4                | 0.06       | 0.00       | 40.95              | 14.35              | 24.64               | 8.63               | 6            | 208            | H   |
| Bungulla                | 11   | -3.0          | -2.3           | 0.3            | -0.7          | -1.1          | 0.3            | 0.5                | 0.06       | -0.06      | 41.07              | 13.98              | 25.24               | 8.59               | 5            | 152            | H   |
| Cara                    | 12   | -4.2          | -2.7           | 0.0            | 0.4           | 0.2           | -2.3           | 1.3                | 0.09       | -0.05      | 39.51              | 13.50              | 24.44               | 8.35               | 4            | 100            | H   |
| Cassilis Park           | 13   | -0.7          | 0.7            | 0.4            | 1.0           | -0.3          | -4.7           | 0.4                | 0.06       | 0.00       | 41.34              | 14.45              | 24.88               | 8.70               | 2            | 71             | M   |
| Centre Plus             | 14   | -3.4          | 5.9            | -0.4           | -4.4          | -0.9          | 6.1            | 2.8                | 0.08       | 0.28       | 46.76              | 15.91              | 27.04               | 9.20               | 15           | 431            | H   |
| Claremont               | 15   | 2.5           | -1.7           | 1.2            | 2.1           | -0.2          | 11.2           | 4.0                | 0.26       | 0.04       | 41.80              | 14.63              | 25.57               | 8.95               | 3            | 95             | H   |
| Collingwood             | 16   | -4.0          | 1.7            | 0.8            | -2.7          | 0.4           | 3.4            | 1.0                | 0.00       | -0.04      | 42.59              | 15.36              | 25.36               | 9.14               | 2            | 62             | M   |
| Corella                 | 17   | -1.1          | -4.5           | 0.4            | -1.5          | 0.6           | 3.0            | -3.3               | 0.23       |            | 42.46              | 14.57              | 26.56               | 9.12               | 2            | 56             | M   |
| Corroboree              | 18   | -2.4          | -1.0           | -0.8           | -0.1          | -0.4          | 4.7            | 0.8                | -0.04      | -0.07      | 44.79              | 14.45              | 27.30               | 8.81               | 3            | 134            | H   |
| Cottage Park            | 19   | 6.4           | 0.6            | -0.3           | -0.3          | 1.1           | -1.5           | -6.7               | 0.25       | 0.10       | 49.40              | 15.00              | 29.62               | 8.99               | 3            | 118            | H   |
| <b>Overall Averages</b> |      | <b>4.2 kg</b> | <b>58.7 kg</b> | <b>18.4 µm</b> | <b>73.3 %</b> | <b>17.5 %</b> | <b>97.2 mm</b> | <b>34.7 N/ktex</b> | <b>2.4</b> | <b>1.2</b> | <b>42.97 \$/hd</b> | <b>14.46 \$/hd</b> | <b>26.10 \$/DSE</b> | <b>8.78 \$/DSE</b> |              |                |     |

Merino Bloodline Performance: a comparison based on wether trial results 2007 - 2018

| Bloodline               | Code | CFW (%)       | LWT (%)        | FD (µm)        | YLD (%)       | FDCV (%)      | SL (mm)        | SS (N/ktex)        | STYLE      | COL        | Profit \$/hd       | St dev \$/hd       | Profit \$/DSE       | St dev \$/DSE      | No. of Teams | No. of Records | ACC |
|-------------------------|------|---------------|----------------|----------------|---------------|---------------|----------------|--------------------|------------|------------|--------------------|--------------------|---------------------|--------------------|--------------|----------------|-----|
| Cressbrook              | 20   | -6.3          | -0.9           | -1.1           | 0.9           | -1.2          | -3.6           | 2.0                | -0.21      | -0.09      | 41.72              | 14.13              | 25.46               | 8.62               | 19           | 615            | H   |
| Darriwell               | 21   | 6.1           | 1.1            | 0.9            | 0.0           | 0.4           | 1.3            | 1.7                | 0.27       | 0.30       | 46.72              | 15.70              | 27.90               | 9.38               | 4            | 125            | H   |
| Deeargee                | 22   | -11.4         | -4.5           | -1.1           | -2.0          | -1.1          | 0.0            |                    | -0.13      | -0.05      | 39.93              | 13.49              | 25.08               | 8.47               | 2            | 65             | M   |
| Egelabra                | 23   | -1.1          | -0.1           | 0.1            | -0.1          | -0.2          | 1.4            | -0.3               | 0.03       | -0.03      | 42.54              | 14.23              | 25.72               | 8.60               | 20           | 780            | H   |
| Emu Park                | 24   | -3.8          | -1.6           | -0.8           | -0.5          | 0.1           | 4.7            |                    | 0.05       |            | 43.93              | 14.23              | 26.86               | 8.70               | 2            | 60             | M   |
| Fosterfield             | 25   | -7.3          | -2.1           | -1.3           | -2.1          | -0.5          | 0.6            |                    | -0.19      | -0.08      | 44.06              | 14.32              | 26.91               | 8.75               | 2            | 75             | M   |
| Glendemar               | 26   | -7.2          | 6.1            | 1.3            | -0.7          | -0.7          | 17.2           | 5.8                | 0.51       | 0.19       | 38.73              | 15.79              | 22.48               | 9.16               | 3            | 93             | H   |
| Grassy Creek            | 27   | -4.1          | 0.5            | -1.0           | -3.6          | -0.8          | -2.6           | 3.7                | -0.02      |            | 47.23              | 15.04              | 28.36               | 9.03               | 3            | 92             | H   |
| Grathlyn                | 28   | -16.9         | -6.6           | -1.9           | -2.4          | -0.8          | -14.0          | -4.5               | -0.16      | -0.04      | 37.48              | 13.01              | 23.98               | 8.32               | 2            | 74             | M   |
| Greendale               | 29   | 4.2           | -2.3           | -0.5           | -1.0          | 0.6           | 0.2            | -2.3               | 0.09       | 0.00       | 48.63              | 14.45              | 29.77               | 8.85               | 15           | 507            | H   |
| Greenland               | 30   | 0.3           | 0.0            | 0.5            | -1.5          | 0.1           | -6.2           | 2.9                | -0.15      | -0.05      | 44.16              | 15.00              | 26.64               | 9.05               | 5            | 172            | H   |
| Grogansworth            | 31   | 4.4           | 1.2            | 0.5            | 2.3           | 1.4           | 2.3            | -6.4               | 0.14       | 0.01       | 43.59              | 14.80              | 26.09               | 8.86               | 7            | 240            | H   |
| Haddon Rig              | 32   | 1.2           | 0.0            | 0.8            | 0.6           | 0.6           | -1.5           | -0.5               | 0.07       | 0.06       | 42.63              | 14.92              | 25.76               | 9.01               | 15           | 664            | H   |
| Havilah North           | 33   | -4.2          | -0.5           | -1.2           | -0.8          | -0.9          | -4.9           | 1.2                | -0.23      | -0.03      | 45.05              | 14.54              | 27.35               | 8.83               | 3            | 109            | H   |
| Hazeldean               | 34   | 1.9           | -0.2           | -0.1           | -0.4          | 0.3           | 5.4            | -3.4               | 0.12       | -0.07      | 45.50              | 14.49              | 27.49               | 8.75               | 24           | 847            | H   |
| Hilltop Park            | 35   | -11.8         | -2.6           | -1.4           | 1.2           | -0.7          | 7.7            | 2.7                | -0.39      | -0.05      | 37.90              | 13.37              | 23.52               | 8.30               | 2            | 40             | M   |
| Karori                  | 36   | -15.6         | -7.0           | -1.9           | -1.0          | -1.6          | -5.9           | 0.9                | -0.44      | -0.11      | 38.05              | 13.06              | 24.37               | 8.37               | 3            | 101            | M   |
| Langdene                | 37   | -1.1          | 0.9            | -0.5           | -0.4          | 0.0           | -3.5           | -2.0               | -0.27      | -0.03      | 45.02              | 14.65              | 27.01               | 8.79               | 3            | 85             | M   |
| Leahcim Poll            | 38   | -4.5          | 3.2            | 1.0            | -0.4          | -0.5          | 8.9            | 3.9                | 0.14       |            | 39.93              | 15.30              | 23.61               | 9.05               | 3            | 82             | H   |
| Longford                | 39   | -6.0          | 0.6            | -1.0           | -0.2          | -1.4          | -2.7           | -0.3               | -0.19      | -0.06      | 43.04              | 14.54              | 25.94               | 8.77               | 3            | 90             | M   |
| <b>Overall Averages</b> |      | <b>4.2 kg</b> | <b>58.7 kg</b> | <b>18.4 µm</b> | <b>73.3 %</b> | <b>17.5 %</b> | <b>97.2 mm</b> | <b>34.7 N/ktex</b> | <b>2.4</b> | <b>1.2</b> | <b>42.97 \$/hd</b> | <b>14.46 \$/hd</b> | <b>26.10 \$/DSE</b> | <b>8.78 \$/DSE</b> |              |                |     |

Merino Bloodline Performance: a comparison based on wether trial results 2007 - 2018

| Bloodline               | Code | CFW (%)       | LWT (%)        | FD (µm)        | YLD (%)       | FDCV (%)      | SL (mm)        | SS (N/ktex)        | STYLE      | COL        | Profit \$/hd       | St dev \$/hd       | Profit \$/DSE       | St dev \$/DSE      | No. of Teams | No. of Records | ACC |
|-------------------------|------|---------------|----------------|----------------|---------------|---------------|----------------|--------------------|------------|------------|--------------------|--------------------|---------------------|--------------------|--------------|----------------|-----|
| Lorelmo                 | 40   | -7.8          | -1.9           | -1.7           | 0.1           | -1.1          | -1.9           | -0.3               | -0.12      | 0.02       | 42.79              | 13.79              | 26.30               | 8.48               | 3            | 90             | M   |
| Merrignee               | 41   | -1.5          | 0.3            | 0.3            | -0.1          | 0.0           |                |                    | -0.05      |            | 41.79              | 14.41              | 25.21               | 8.69               | 2            | 59             | M   |
| Merrinjuck              | 42   | -13.1         | -4.0           | -0.1           | -4.3          | -0.4          |                |                    | 0.02       |            | 37.27              | 13.28              | 23.25               | 8.29               | 2            | 60             | M   |
| Merryshiels             | 43   | -7.9          | -0.4           | -1.3           | -2.3          | -1.6          | 2.6            | -0.2               | 0.03       | -0.10      | 43.96              | 14.46              | 26.66               | 8.77               | 2            | 59             | M   |
| Merryville              | 44   | -10.5         | -4.2           | -1.4           | -0.9          | -0.3          | -10.7          | -1.9               | -0.22      | -0.10      | 40.53              | 13.44              | 25.39               | 8.42               | 16           | 455            | H   |
| Middle View             | 45   | -3.0          | -0.9           | -0.7           | -1.9          | -0.2          | -5.2           | 1.5                | -0.13      | -0.06      | 45.45              | 14.48              | 27.61               | 8.80               | 11           | 378            | H   |
| Myocum                  | 46   | -7.0          | -2.8           | -0.5           | -2.0          | -0.5          | -7.9           | 3.4                | -0.14      | -0.07      | 41.20              | 13.69              | 25.46               | 8.46               | 3            | 121            | H   |
| Nerstane                | 47   | -3.3          | -1.6           | -0.6           | -0.4          | -1.0          | 3.3            | 4.0                | -0.05      | -0.04      | 43.43              | 14.09              | 26.55               | 8.61               | 13           | 404            | H   |
| One Oak                 | 48   | 7.7           | 3.7            | 1.6            | 2.4           | 0.2           | 5.9            | -0.9               | 0.11       | -0.02      | 45.20              | 16.09              | 26.59               | 9.46               | 5            | 159            | H   |
| One Oak No 2            | 49   | 2.4           | 2.1            | 0.4            | 0.4           | 0.5           | 2.1            | 1.9                | -0.11      | -0.05      | 43.86              | 15.11              | 26.10               | 8.99               | 2            | 90             | M   |
| Pastora                 | 50   | -1.7          | 1.8            | -0.7           | -1.4          | 0.0           | -0.9           | -0.5               | 0.01       | -0.02      | 46.08              | 15.03              | 27.44               | 8.95               | 52           | 1741           | H   |
| Pomanara                | 51   | -12.5         | -3.2           | -1.6           | -1.2          | -0.4          | -13.4          | -4.5               | -0.25      | -0.11      | 39.96              | 13.47              | 24.85               | 8.38               | 2            | 44             | M   |
| Pooginook               | 52   | 3.7           | 2.1            | 0.8            | 1.7           | 0.1           | 0.0            | 0.0                | 0.00       | 0.00       | 43.36              | 15.26              | 25.82               | 9.09               | 14           | 420            | H   |
| Quamby Park Poll        | 53   | -6.7          | -1.8           | -1.4           | 0.4           | -1.0          | -8.6           | 0.1                | -0.11      | -0.12      | 42.69              | 13.93              | 26.22               | 8.56               | 2            | 73             | M   |
| Rockdale                | 54   | -1.1          | 1.0            | -0.4           | -0.1          | 0.2           | 0.7            | 1.5                | 0.05       | 0.10       | 44.15              | 14.54              | 26.49               | 8.72               | 3            | 87             | H   |
| Rogara                  | 55   | -5.4          | 0.6            | -1.0           | 0.3           | -1.0          | -5.9           | 1.1                | -0.06      | -0.06      | 42.83              | 14.51              | 25.82               | 8.75               | 2            | 50             | M   |
| Roseville Park          | 56   | -1.7          | -0.6           | -0.6           | -1.6          | 0.0           | -0.4           | -1.7               | 0.01       | -0.02      | 45.64              | 14.47              | 27.64               | 8.76               | 10           | 320            | H   |
| Roxanna Poll            | 57   | 0.5           | 0.8            | 1.0            | 1.8           | 0.4           | -0.7           | -0.1               | 0.33       | 0.02       | 41.14              | 14.88              | 24.74               | 8.95               | 3            | 138            | H   |
| Severn Park             | 58   | -2.3          | 2.9            | 0.3            | 0.6           | -0.9          | 5.2            | 1.6                | 0.16       | -0.19      | 40.87              | 14.70              | 24.22               | 8.72               | 7            | 262            | H   |
| <b>Overall Averages</b> |      | <b>4.2 kg</b> | <b>58.7 kg</b> | <b>18.4 µm</b> | <b>73.3 %</b> | <b>17.5 %</b> | <b>97.2 mm</b> | <b>34.7 N/ktex</b> | <b>2.4</b> | <b>1.2</b> | <b>42.97 \$/hd</b> | <b>14.46 \$/hd</b> | <b>26.10 \$/DSE</b> | <b>8.78 \$/DSE</b> |              |                |     |

Merino Bloodline Performance: a comparison based on wether trial results 2007 - 2018

| Bloodline               | Code | CFW (%)       | LWT (%)        | FD (µm)        | YLD (%)       | FDCV (%)      | SL (mm)        | SS (N/ktex)        | STYLE      | COL        | Profit \$/hd       | St dev \$/hd       | Profit \$/DSE       | St dev \$/DSE      | No. of Teams | No. of Records | ACC |
|-------------------------|------|---------------|----------------|----------------|---------------|---------------|----------------|--------------------|------------|------------|--------------------|--------------------|---------------------|--------------------|--------------|----------------|-----|
| Shalimar Park           | 59   | -8.0          | -1.7           | -1.5           | 0.2           | -0.8          | -7.3           | -0.7               | -0.24      | -0.09      | 41.90              | 13.86              | 25.72               | 8.50               | 6            | 160            | H   |
| Tallawong               | 60   | -1.1          | -2.3           | -1.5           | -0.6          | -0.6          | 2.4            | 1.6                | -0.11      | -0.02      | 47.71              | 14.39              | 29.30               | 8.84               | 8            | 276            | H   |
| The Lagoons             | 61   | 1.2           | 0.0            | 0.5            | -0.3          | 0.2           | -0.9           | -2.3               | -0.10      |            | 43.52              | 14.84              | 26.27               | 8.96               | 3            | 84             | M   |
| The Yanko               | 62   | 1.7           | 2.9            | 0.5            | 2.8           | -0.2          | 2.2            | 0.2                | 0.22       | 0.33       | 41.32              | 14.86              | 24.51               | 8.81               | 2            | 71             | M   |
| Towalba                 | 63   | 4.2           | -0.1           | 1.7            | 0.2           | 2.4           | 1.4            | -6.9               | 0.04       | -0.04      | 44.96              | 15.40              | 27.12               | 9.29               | 2            | 77             | M   |
| Wallaloo Park           | 64   | -3.0          | -0.7           | -0.2           | 0.7           | -0.9          | 6.6            | 0.1                | 0.12       | 0.16       | 41.50              | 13.96              | 25.23               | 8.49               | 5            | 139            | H   |
| Wantana                 | 65   | 1.0           | -1.6           | 0.5            | -1.7          | 0.4           | -0.6           | 0.8                | 0.11       | 0.05       | 44.67              | 14.80              | 27.22               | 9.02               | 4            | 122            | H   |
| West Vale               | 66   | -7.8          | -5.7           | -0.8           | 0.2           | -0.3          | -8.3           | 1.4                | -0.21      | -0.11      | 39.71              | 13.23              | 25.16               | 8.38               | 5            | 165            | H   |
| Weston Park             | 67   | -8.6          | -3.2           | -1.3           | -3.6          | -0.1          | -5.8           | -4.5               | -0.03      |            | 44.10              | 14.24              | 27.32               | 8.82               | 3            | 66             | M   |
| Willandra               | 68   | 11.4          | 4.8            | 1.4            | 4.7           | 0.6           | 0.1            | 0.2                | 0.04       |            | 45.51              | 16.23              | 26.57               | 9.47               | 3            | 82             | H   |
| Woodpark Poll           | 69   | -1.2          | 4.1            | -0.1           | -1.0          | 0.0           | 1.9            | -0.3               | 0.08       | 0.23       | 43.95              | 15.08              | 25.77               | 8.84               | 9            | 258            | H   |
| Woolaroo                | 70   | -1.1          | -1.5           | -0.8           | -1.3          | 0.7           | -5.1           | -3.1               | -0.12      | -0.05      | 46.59              | 14.54              | 28.41               | 8.87               | 13           | 419            | H   |
| Wyuna                   | 71   | 2.5           | -2.3           | 1.3            | 2.2           | 0.9           | 1.9            | -3.0               | 0.38       | 0.21       | 41.74              | 14.53              | 25.65               | 8.93               | 2            | 75             | M   |
| Yalgoo                  | 72   | -9.4          | -3.0           | -1.8           | -0.4          | -1.3          | -3.3           | 0.9                | -0.14      | -0.09      | 41.90              | 13.56              | 26.00               | 8.41               | 15           | 423            | H   |
| Yarrowonga              | 73   | 2.1           | -1.5           | -0.5           | -1.5          | 0.3           | 1.0            | -1.3               | 0.00       | -0.06      | 47.84              | 14.56              | 29.13               | 8.87               | 11           | 386            | H   |
| <b>Overall Averages</b> |      | <b>4.2 kg</b> | <b>58.7 kg</b> | <b>18.4 µm</b> | <b>73.3 %</b> | <b>17.5 %</b> | <b>97.2 mm</b> | <b>34.7 N/ktex</b> | <b>2.4</b> | <b>1.2</b> | <b>42.97 \$/hd</b> | <b>14.46 \$/hd</b> | <b>26.10 \$/DSE</b> | <b>8.78 \$/DSE</b> |              |                |     |

Note: CFW and LWT are reported as a percentage deviation. This means that the average value for the trait equals 100%. A deviation of 10, for example, means that the bloodline has a genetic value of 110% of the average. Taking bloodline 68 as an example for CFW, this would be calculated as Bloodline 68 = 111.4% of mean or 1.114 x 4.2 kg which equals 4.68 kg. Similarly, if a bloodline has a deviation of -10, then the genetic value is 90% (i.e. 100 - 10) of the average. Taking bloodline 28 as an example, the CFW of Bloodline 28 would be 0.831 x 4.2 kg which equals 3.49 kg.

Figure 1 Performance of 73 bloodlines for clean fleece weight (CFW, %) relative to fibre diameter (FD,  $\mu\text{m}$ )

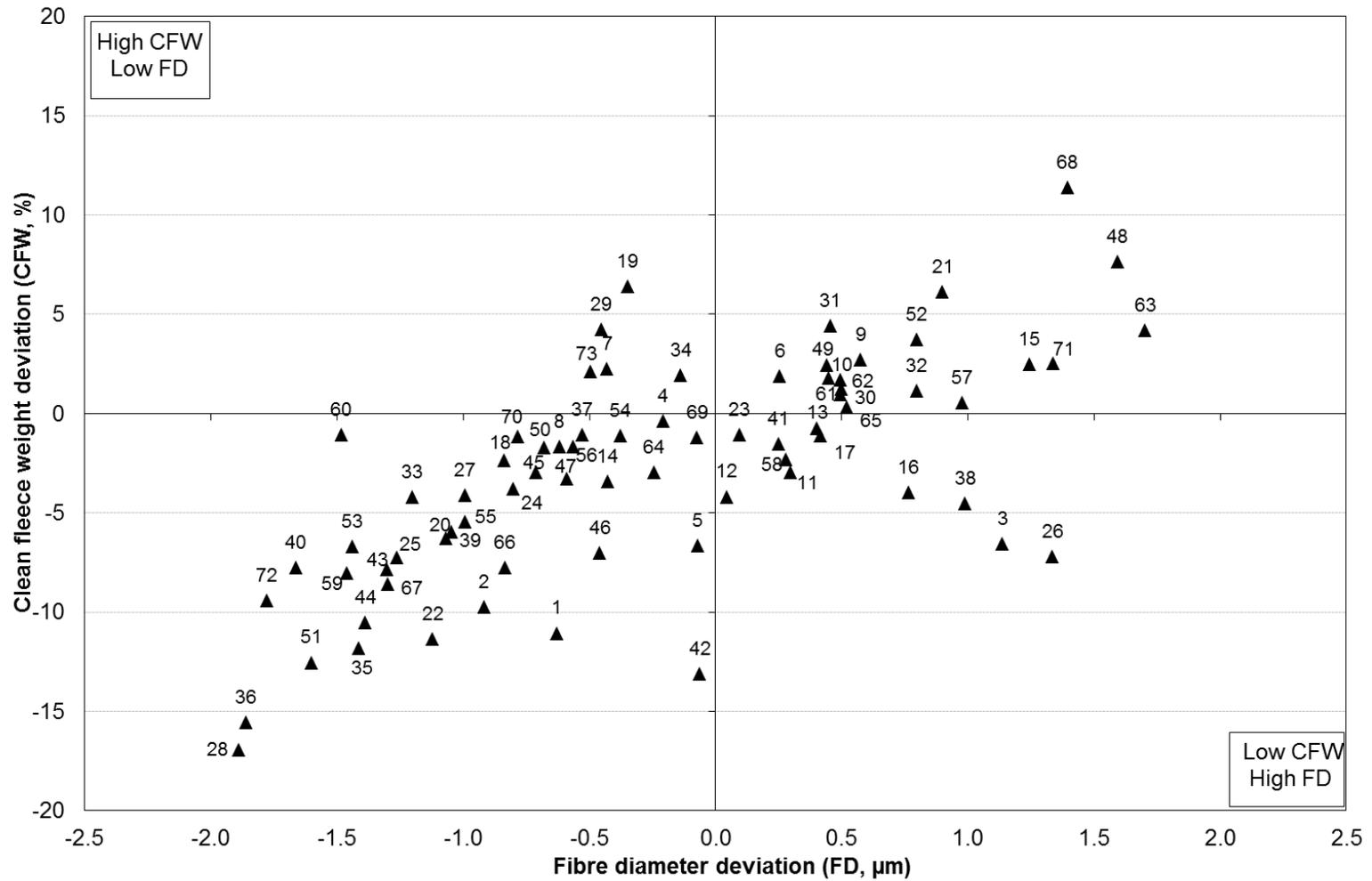
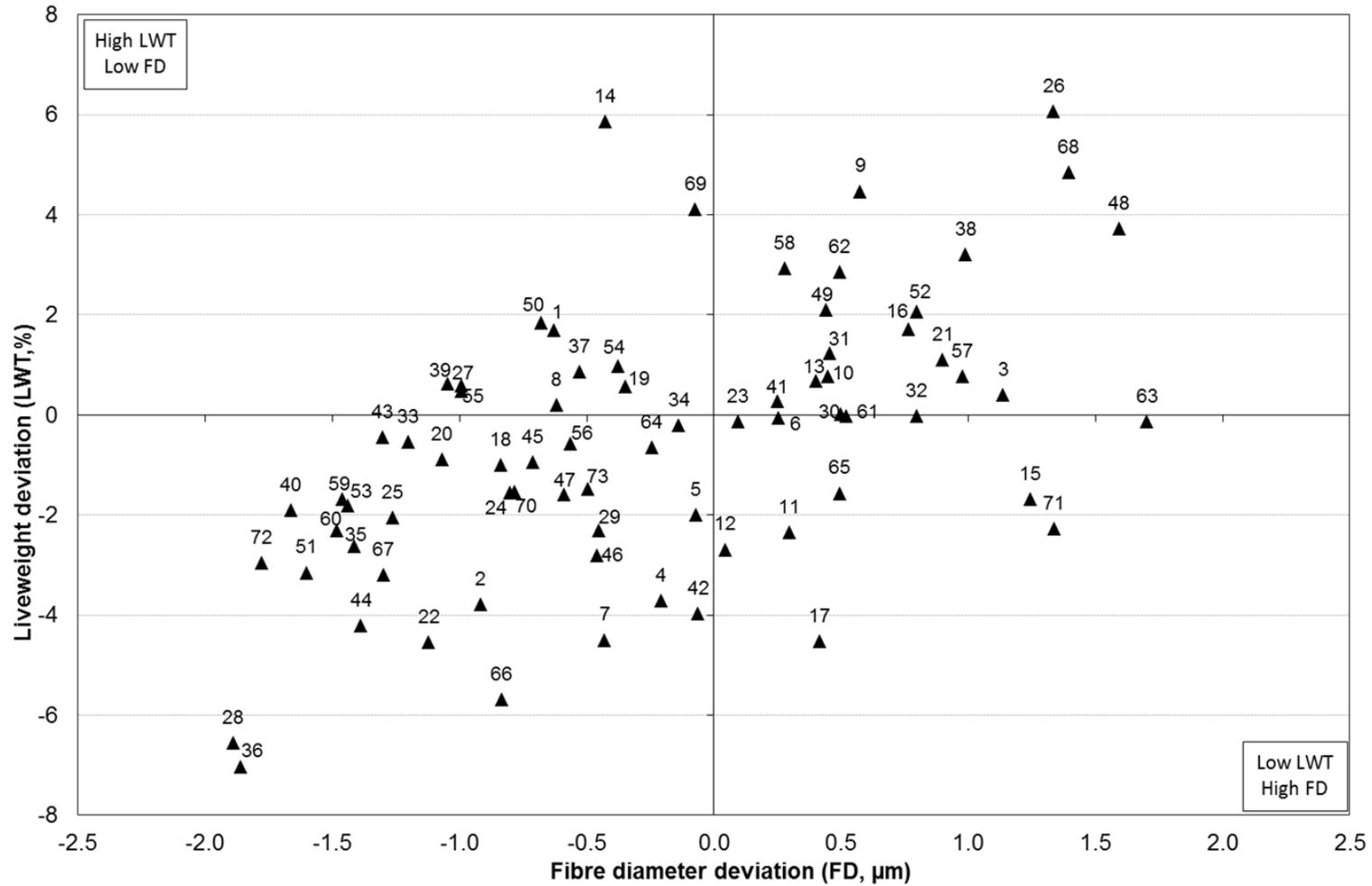


Figure 2 Performance of 73 bloodlines for liveweight (LWT, %) relative to fibre diameter (FD,  $\mu\text{m}$ )



**Figure 3 Performance of 73 bloodlines for (a) staple length (SL, mm), (b) staple strength (SS, N/ktex) relative to fibre diameter (FD,  $\mu\text{m}$ )**

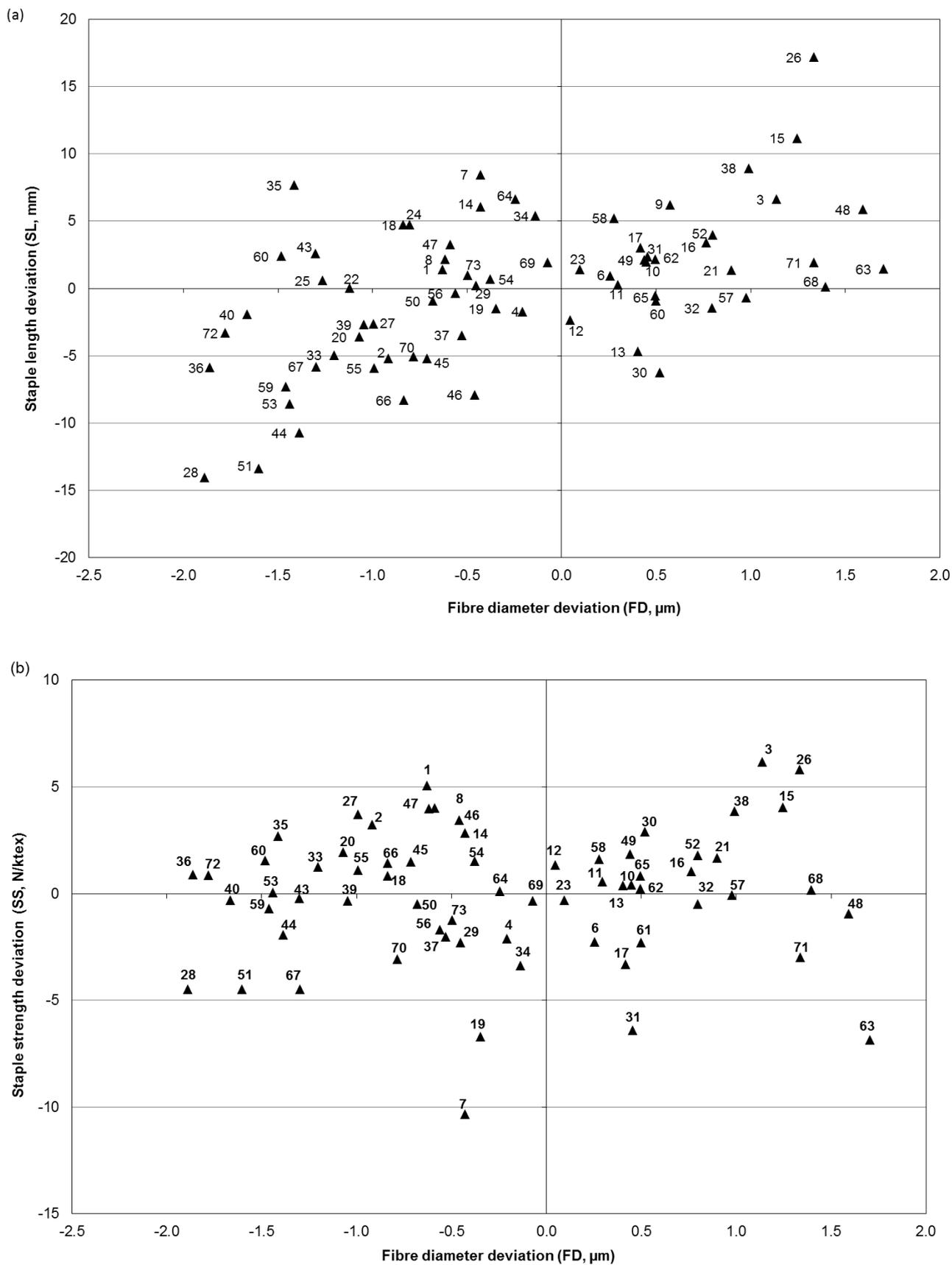


Figure 3 (continued) Performance of 73 bloodlines (c) style and (d) colour relative to fibre diameter (FD,  $\mu\text{m}$ )

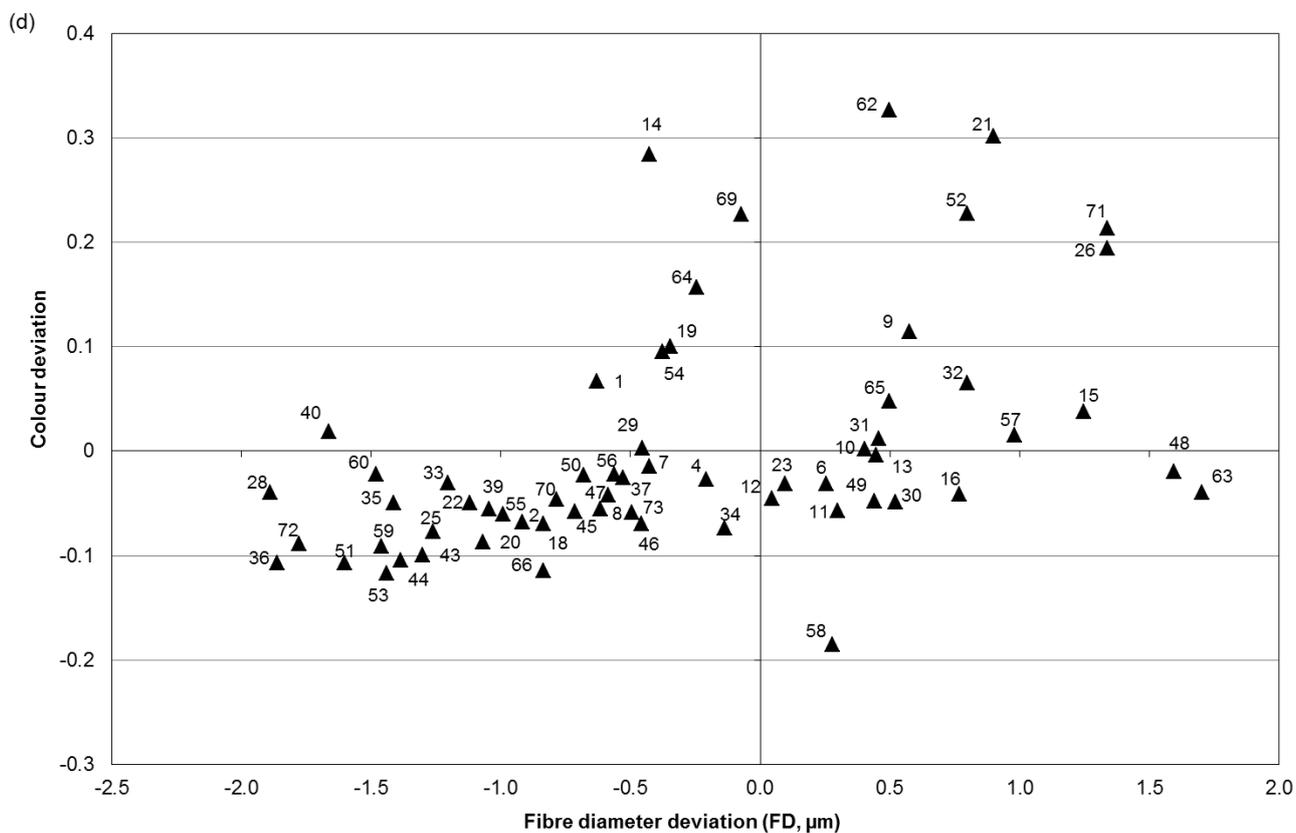
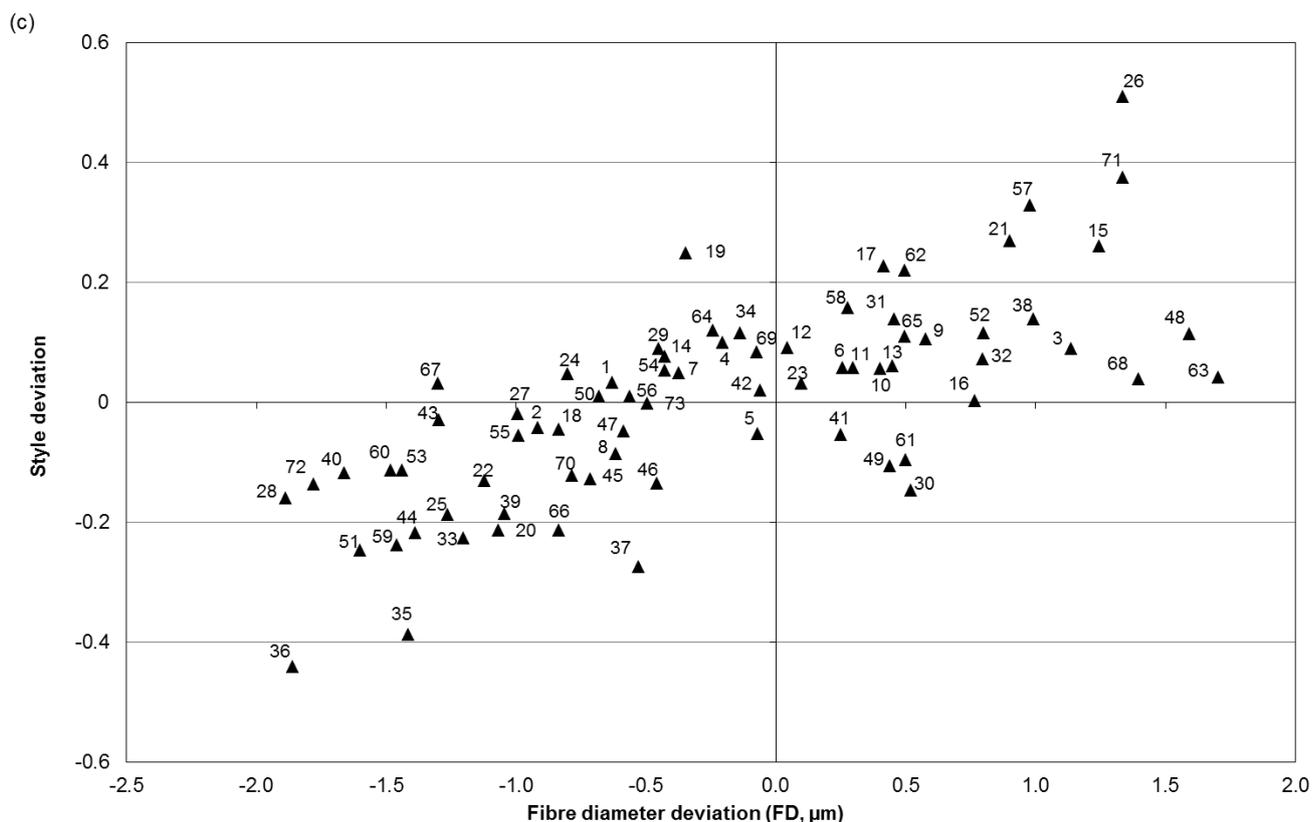


Figure 4 Bloodline deviations for profit calculated as \$/head (\$/hd) and fibre diameter (FD,  $\mu\text{m}$ ) for the 73 bloodlines

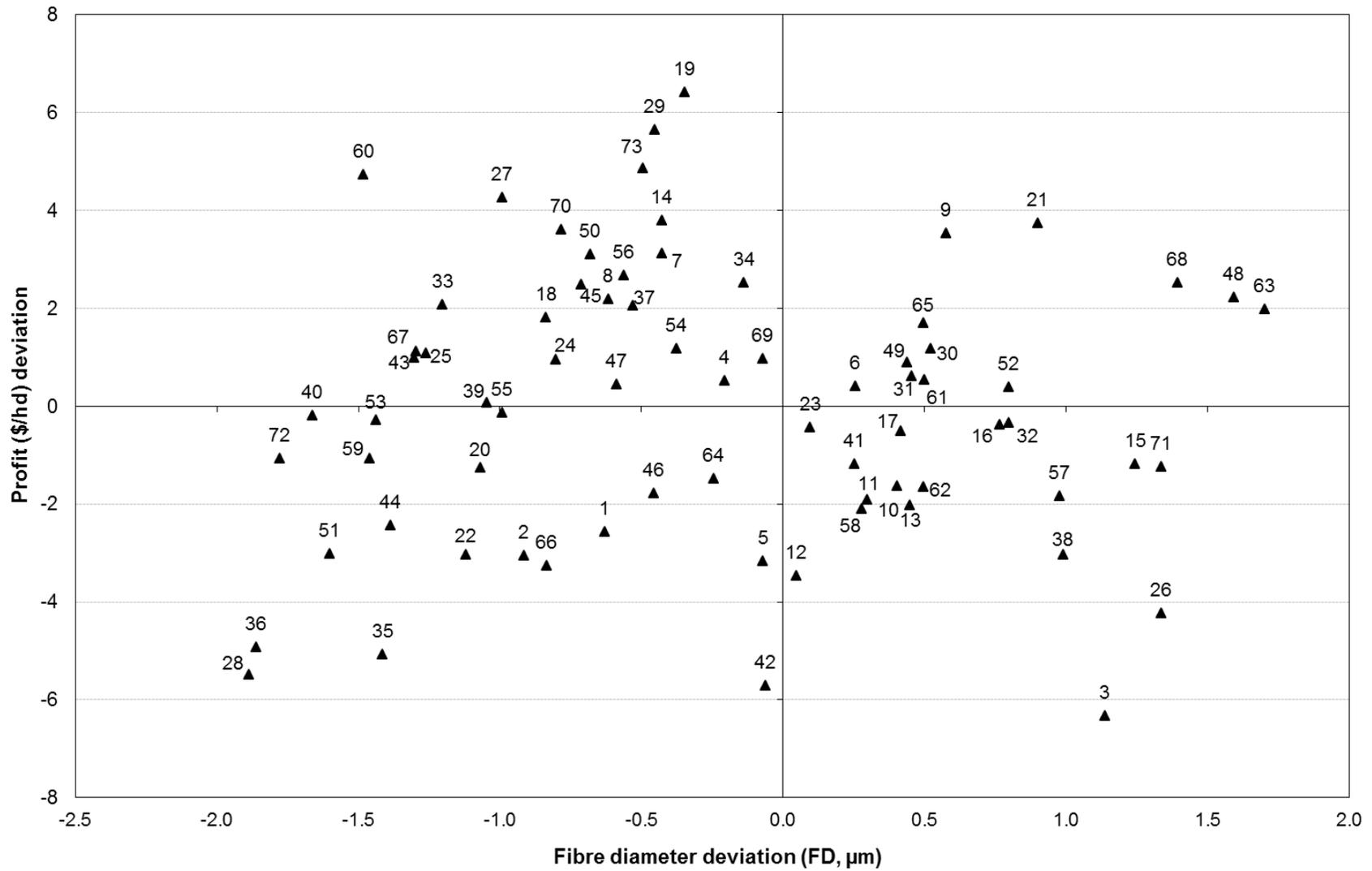


Figure 5 Bloodline deviations for profit calculated as \$/ dry sheep equivalent (DSE) relative to fibre diameter (FD,  $\mu\text{m}$ ) for the 73 bloodlines

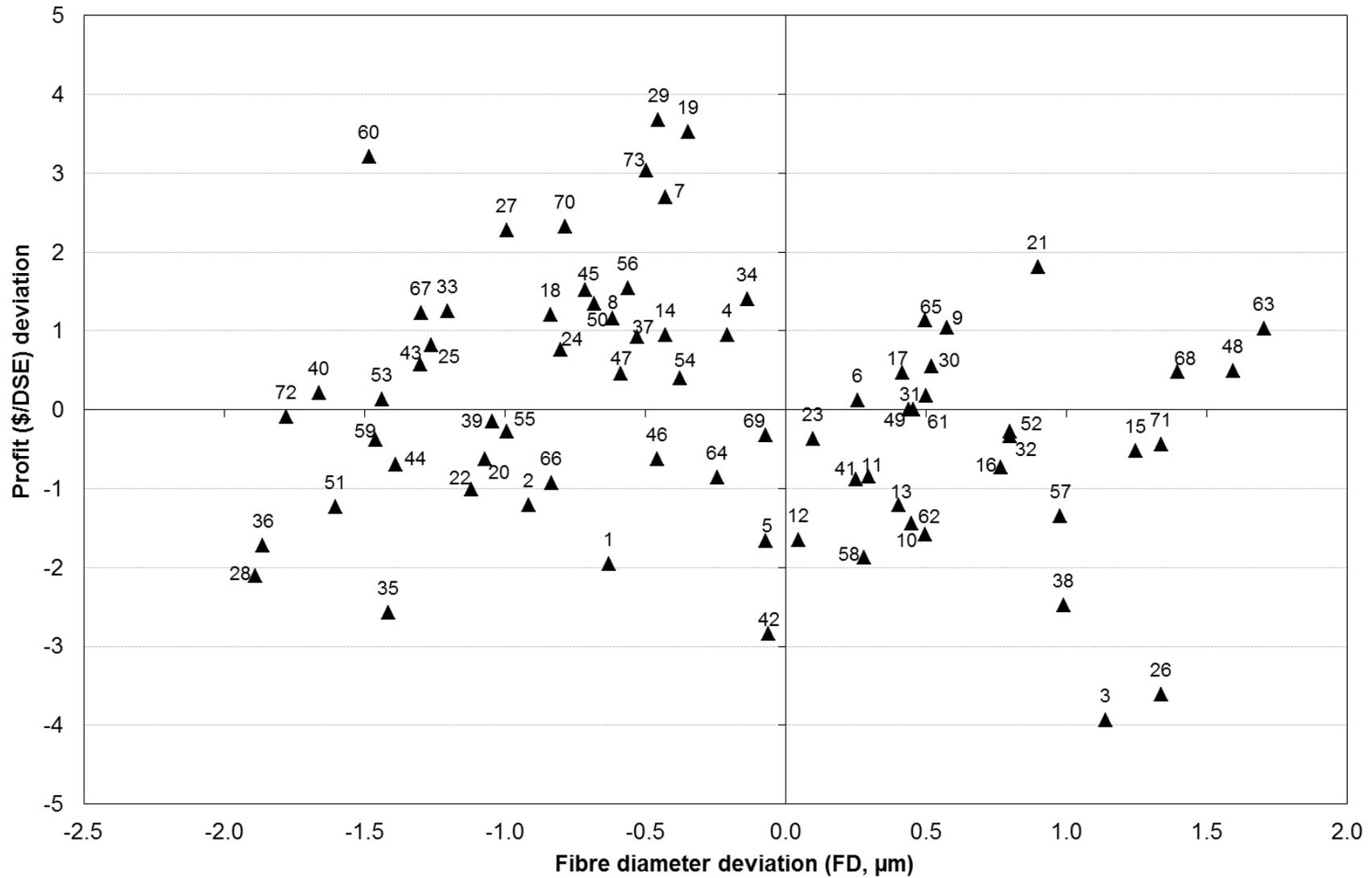


Figure 6 Bloodline deviations for profit calculated as \$/ dry sheep equivalent (DSE) relative to clean fleece weight (CFW, %) for the 73 bloodlines

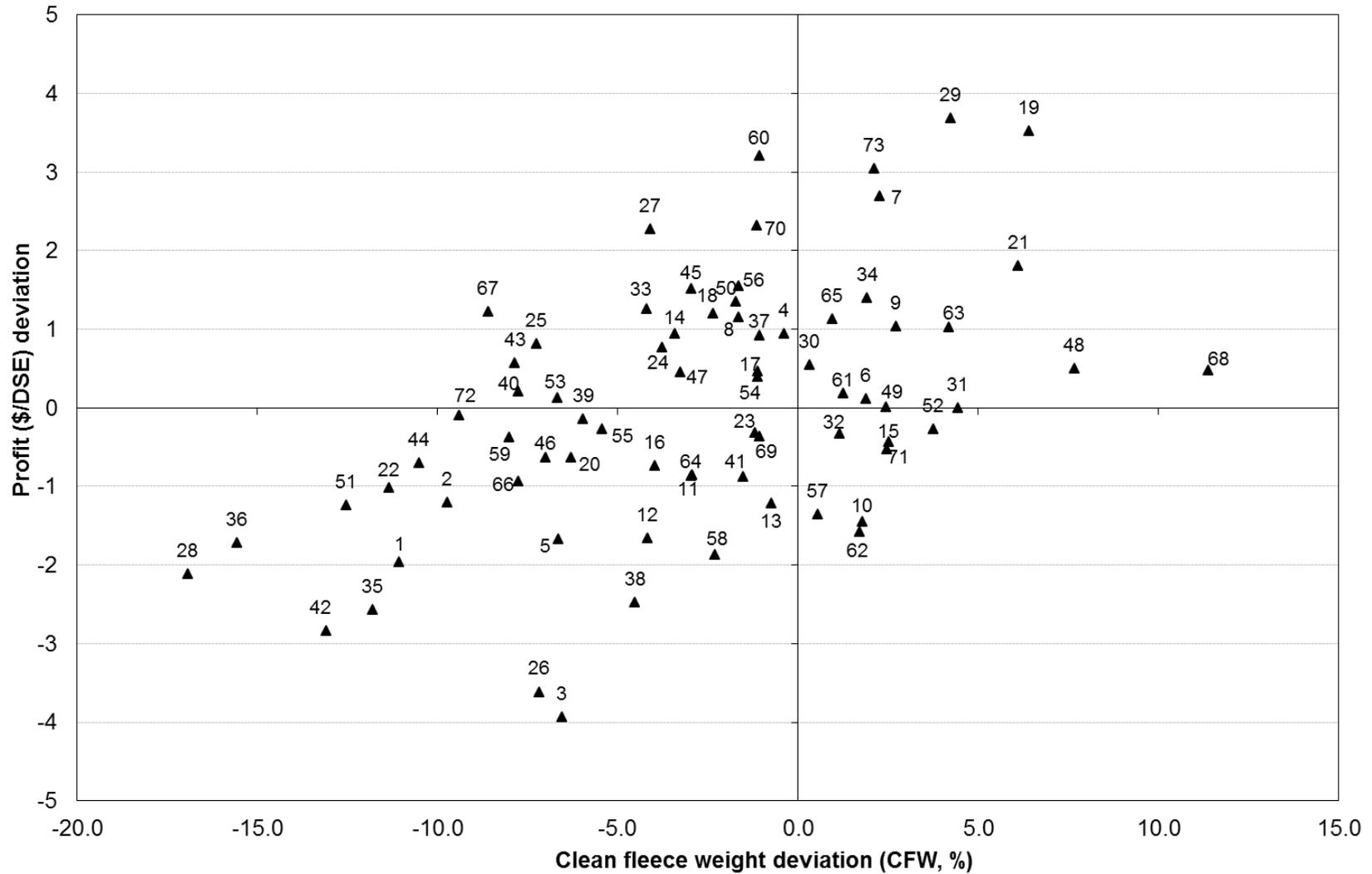
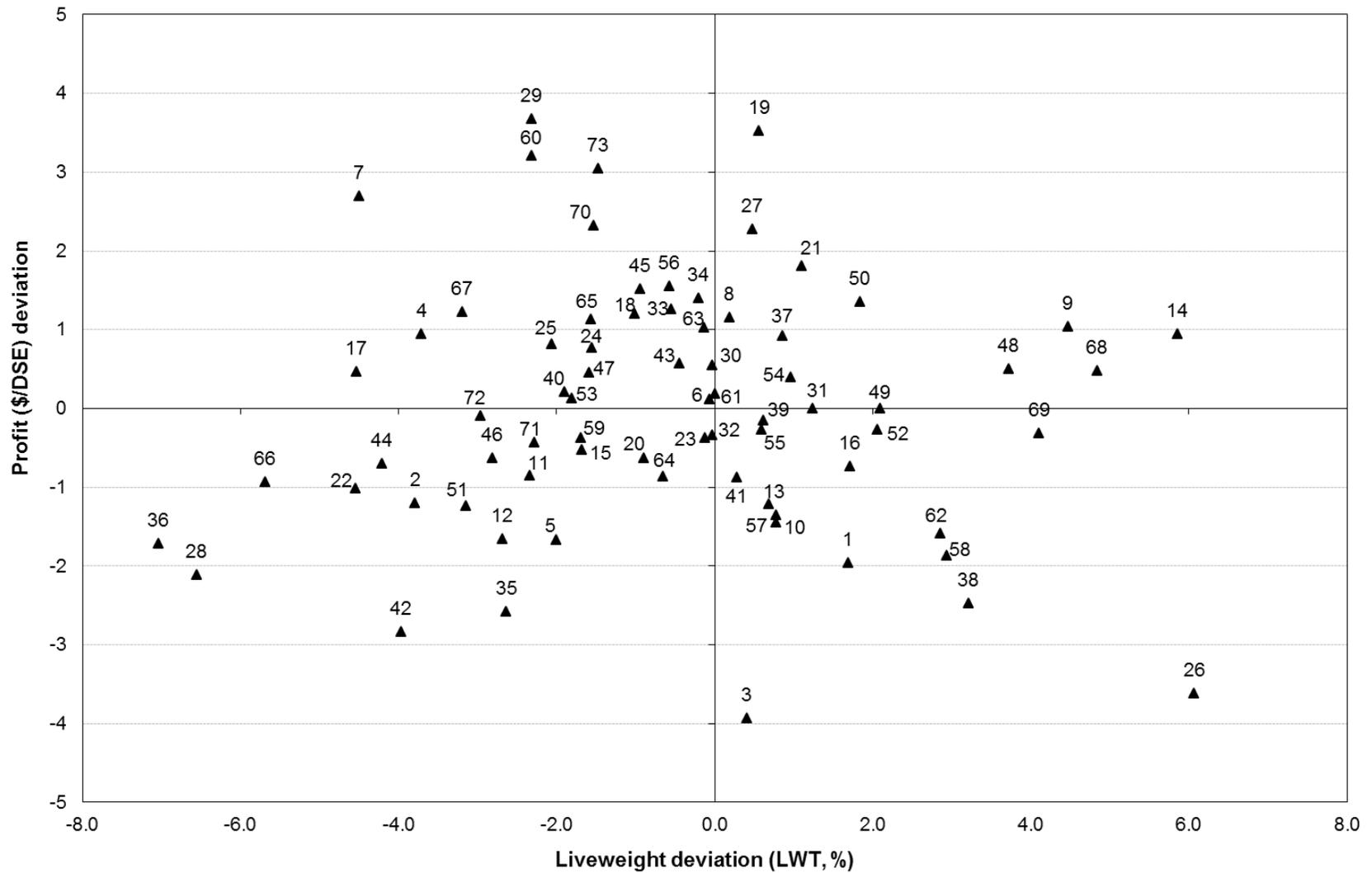


Figure 7 Bloodline deviations for profit calculated as \$/ dry sheep equivalent (DSE) relative to liveweight (LWT, %) for the 73 bloodlines



### Other useful resources

To make the best use of the information contained in this Primefact, producers should consider the details on the inside cover of the Merino Bloodline Performance folder [or in Primefact 74 when accessed electronically].

The Merino Bloodline Performance website ([www.merino-bloodlines.com.au](http://www.merino-bloodlines.com.au)) has been updated with the results of this analysis along with all the information contained in the bloodline package.

Other potential methods to benchmark your flock are:

- Sheep DNA flock profiling: which utilises genomics to give you an estimated genetic merit of your flock
- Ramselect Ram team manager: monitoring your ram purchases over the past years to map genetic progress for your flock

Other associated information sources include:

- *Designing and conducting Merino wether comparisons and on-farm genetic evaluations.*  
<http://www.dpi.nsw.gov.au/agriculture/merino-bloodline-performance/running-wether-trials>
- Merino Superior Sires website.  
<http://www.merinosuperiorsires.com.au/>
- Sheep Genetics MERINOSELECT website.  
<http://www.sheepgenetics.org.au/Breeding-services/MERINOSELECT-Home>

If you require further information, contact

Sue Mortimer,  
Research Scientist, NSW DPI  
ph (02) 6770 1836

Kathryn Egerton-Warburton,  
Development Officer, NSW DPI  
ph (02) 6391 3954

Luke Stephen,  
Technical Specialist, NSW DPI  
ph (02) 6770 1843

Email [merino-bloodlines@dpi.nsw.gov.au](mailto:merino-bloodlines@dpi.nsw.gov.au)

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Your Reference number (generally CM9)

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