Sheep CRC ASBV Case Studies

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"TURNING TURKEY LANE AROUND"

GREG JOHNSSON, AGVET SERVICES & KANGAROO ISLAND SHEEP PRODUCTION GROUP
JOHN AND JO SYMONS, "TURKEY LANE", PARNDANA, KANGAROO ISLAND

Photo: Greg Johnsson, Agvet Services & Kangaroo Island Sheep Production Group

- A combination of Australian Sheep Breeding Values and small management changes have increased wool flock returns by 400% over the last 13 years, with the 2012 profit sitting at $525 per ha
- A selection system based on ASBVs and indexes has transformed a 24 µm flock to a flock producing rams in the top 1% of sires in the industry based on the Fibre Production + index
- Belief and thorough implementation of genetic selection tools delivers
- Turkey Lane proves that momentous results are achievable – both to productivity and profitability

Some 13 years ago Kangaroo Island woolgrowers John and Jo Symons realised that they needed to change the way they managed their farm.

They had serious concerns about the viability of the enterprise and the outlook for the future.

But little did they know that their next step would lead to such dramatic change in their flock, the way they managed their farm and their bottom line.

"We were doing it pretty tough. For a variety of reasons we owed a fair bit of money and banks were being pretty miserable. So, we had to do something different," John said.

They approached Greg Johnsson's Agvet Services for advice, wondering if they should consider changing their ram source or turning to a dual-purpose breed. Coincidentally the Agvet Services team had been planning a model farm for the Kangaroo Island Sheep Production group.

"We were looking for a farm where we could put in place what we considered to be best practice management techniques, demonstrating and evaluating its effects on-farm as well as introducing and evaluating some newer and older technologies and approaches," Greg said.

The Symons run 'Turkey Lane', a 530-hectare property located at Parndana. The property runs a commercial flock of around 6,000 Merinos and receives an annual rainfall of 715mm.

With Greg's input, the Symons arranged to set up Turkey Lane as a fully commercial model farm.

This involved developing a best-practice management program including a breeding strategy, and evaluating that in an open way so that progress could be tracked over time. "The first step was to look at what had been happening on the farm and John is a good record keeper which is one of the reasons we were keen to work with him," Greg said. "So we pulled out wool records that went back to 1983 and we looked at production trends on the property from the previous 16 years."

Using these records Greg produced charts that showed a rolling 10-year average of adult greasy fleece weight per head and average adult fibre diameter (Figure 1). By using a rolling 10-year average, production trends could be observed by removing some of the environmental impact. For example, the point for 1992 includes the figure for 1992 and the previous 9 years of data; the figure for 1993 is that year plus the previous 9 years of data; and so on.

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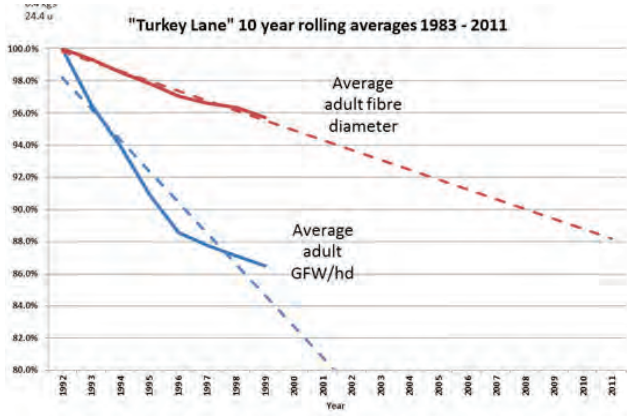

Figure 1. Turkey Lane 10 year rolling averages 1983—2000 for adult fleece weight (GFW) per head and adult fibre diameter per head (solid line), dashed lines are the "trend" lines.

The 10-year average production for the flock in 1992 was 6.4kg per head at 24.4μm. Figure 1 shows that the Symons were trying to respond to market signals by reducing micron, and they had approached this by selecting the finer rams from their ram source. The result was that, over 16 years, the Symons had reduced fibre diameter by 4% but what the flock had gained in diameter was lost in fleece weight which was heading in an unsustainable direction. So, in 2000 a best practice program was developed by Greg and his team, in consultation with the Symons family. Its introduction involved changes to:

- Time of lambing - lambing moved from June to mid to late July to match feed supply to feed demand.
- Stocking rate - stocking rates were slightly increased through the impact of later lambing and matching feed supply with demand. This resulted in an improvement from 12.3 DSE/ha to 13.3 DSE/ha over 12 years.
- Time of shearing - originally all sheep were shorn in December; this was changed to January so that some of the fleece measurement could be fitted in as well.
- Lambing shearing - was moved from December to the break of the season shearing in April, to maximise the value of the first (yearling) and second (hogget) shearings.
- Cast for age sheep management - continued to be shorn in December to get them off the property whilst in good fat condition, not requiring hand feeding and with minimal compromise to wool production.
- Training - involved attending a Prograze course to improve John's understanding of pasture management and his sheep's nutritional requirements.
- Farm Production and Financial Benchmarking - created an opportunity to measure and track changes and identify areas that needed attention.
- Genetic improvement program – the development of a ram breeding program involving AI and incorporation of breeding values and index selection. These home bred rams were used in the flock for the first time in the 2001 mating as ram lambs.

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Genetic Improvement Program

The first critical change in the breeding program was the development of a specific and time-limited breeding objective.

They set a breeding objective that by 2006 the adult flock would have an average micron of 20μm and maintain a cut of 50kg of greasy wool per hectare.

"There were plenty of people who told us that we wouldn't be able to reduce micron and maintain the current wool cut," Greg said. "And those statements made us even more determined to show what could be done."

However, the Symons held some biosecurity concerns about bringing in rams form external sources and potentially compromising the health of their flock. It was decided instead that they would start their own ram nucleus.

This change, to breeding rams for the enterprise, also allowed Greg to showcase the technology and tools available in genetic selection and breeding, even though the level of technology involved was much higher than what was required in a commercial operation.

The selection process in the commercial flock involved measuring hogget ewes and selecting them for breeding based on the same index that was being applied in the ram breeding operation. Emphasis was also placed on improving reproduction rate so that there would be more progeny to select from, which would increase selection pressure.

However, many of the management changes to be introduced were likely to have a negative impact on adult fleece weight per head. (See Table 1 over page).

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Table 1. Expected effect on adult greasy fleece weight per head (GFW) as a result of management changes.

Management change that can be expected to impact on adult GFW	Direction of management change	Expected effect on adult GFW/ head
• Stocking rate	↑	↓
• Proportion of ewes in flock	↑	↓
• % of pregnant and rearing ewes	↑	↓
• Average fibre diameter of clip	↓	↓
• % of adult flock prem shorn	↑	
- Hoggets 9 months wool (20% of flock)		↓↓
- CFA 10-11 months wool (20% of flock)		↓

The actual outcome, though, is revealed by looking at the rolling averages after three years of implementing the new regime (Figure 2).

The rapid decline in fleece weight was arrested and there was a slowing of the trend to reduce fibre diameter, as a result of running sheep in a better production system (matching feed requirements to availability).

The flock performance at that time (3 years on at the start of 2003) was purely a result of the gradual introduction of management changes, as the genetic changes from the home bred rams would take longer to impact the adult fleece results.

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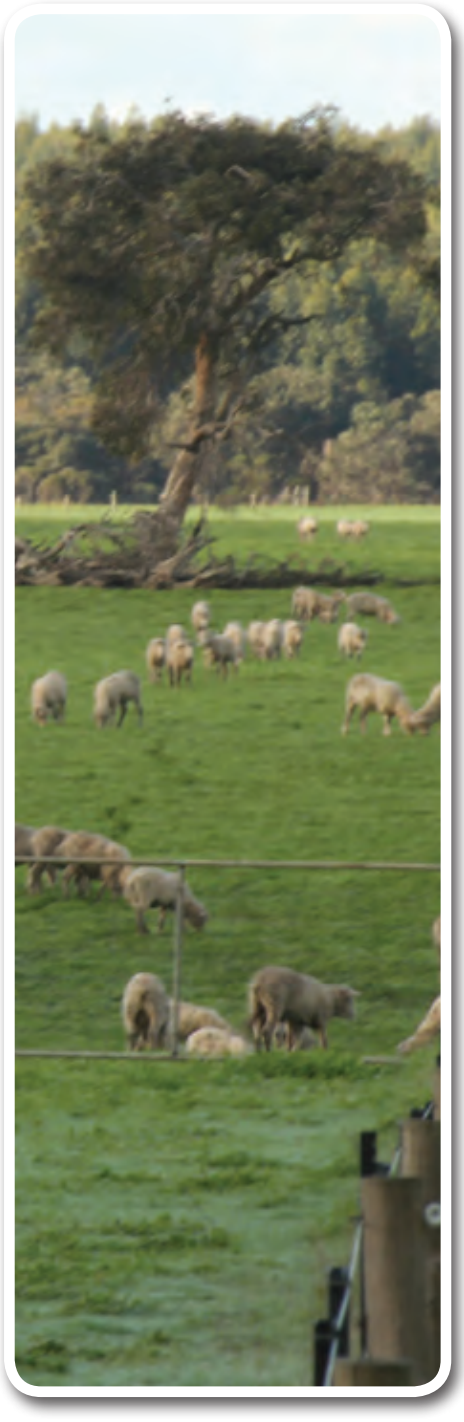

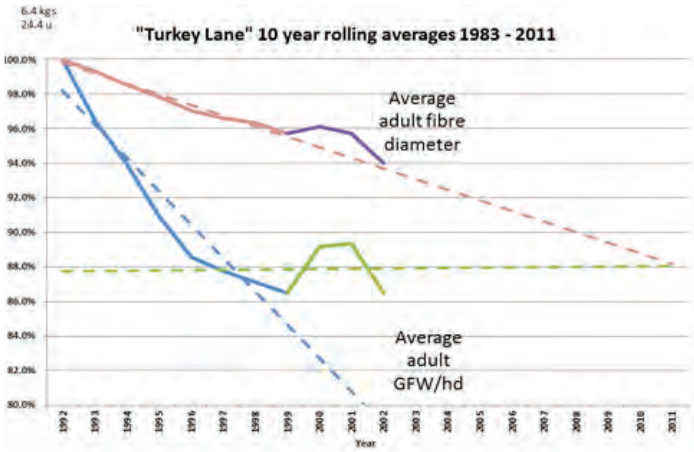

Figure 2. Turkey Lane 10 year rolling averages 1983—2002 for adult fleece weight per head (GFW) and adult fibre diameter per head (solid line), the dashed lines are the "trend" lines

Ten years on and now with 13 years of data, the longer-term effects on production of the genetic program become apparent (Figure 3). Figure 4 and Figure 5 show trend lines for the rolling average based on the original flock trends versus the new trajectory. Using an index that is the equivalent to the MERINOSELECT Fibre Production index (FP+), which aims to decrease fibre diameter and maintain fleece weight, Turkey Lane has achieved a significant drop in micron whilst at the same time significantly increasing wool cut. "When the genetic changes started to become apparent, the impact was massive for both fibre diameter and wool cut. This was despite all the management changes that in theory would negatively impact on wool cut per head," Greg said.

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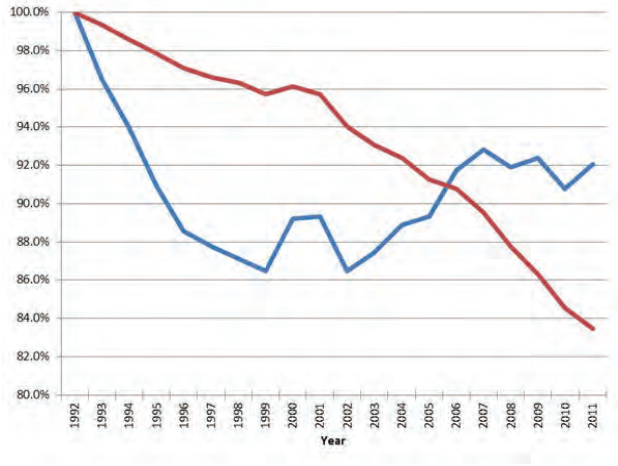

Figure 3. Turkey Lane 10 year rolling average 1983—2011 for adult fibre diameter and greasy fleece weight (GFW) per head

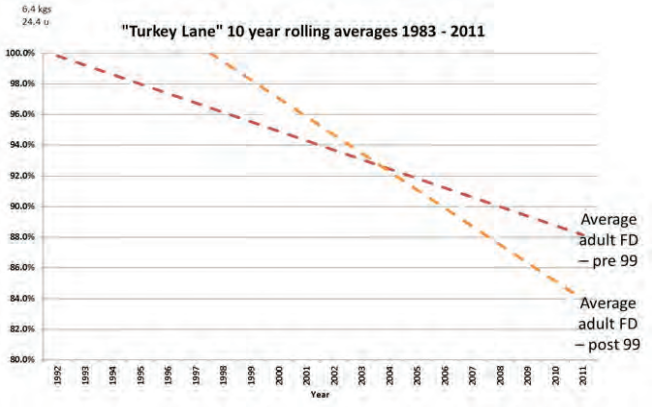

Figure 4. Turkey Lane 10 year rolling average trend lines 1983—2011 for adult fibre diameter per head

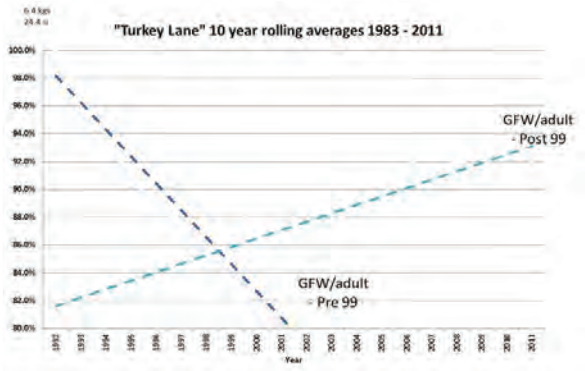

Figure 5. Turkey Lane 10 year rolling average trend lines 1983—2011 for adult fleece weight (GFW) per head

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The gains observed are a combination of management and genetics which has delivered a trend increase of 10% in greasy fleece weight per hectare (Figure 6). This is despite using an index that aims to only maintain fleece weight and is focussing predominately on reducing fibre diameter. This increase in wool cut – based on the farms current trend level of wool value per kg (2012) – is worth $25,000 in extra income in this enterprise.

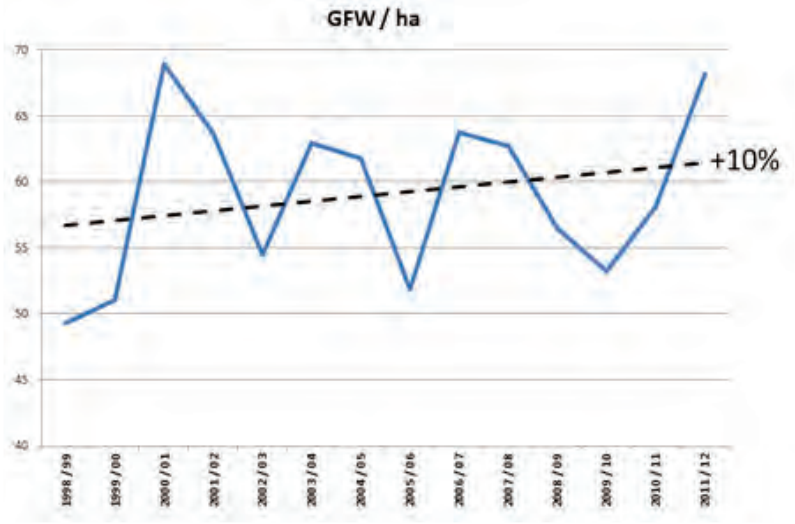

Figure 6. Greasy Fleece Weight per hectare (GFW/ha) over time

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Average flock fibre diameter has declined from over 23μm to around 19μm since 1999. This change in fibre diameter as show in Figure 7 has not come at the expense of production per DSE (which has been stable since 2000) indicating that these changes are genetic rather than from running 'hunger-fine' animals.

The end result is a wool clip that is selling into the premium end of the market and attracting an additional $2.00 per kg in returns (Figure 8) above what the flock might have achieved if the genetic change had tracked the national flock (as expressed by the EMI). Across the 30-35,000 kg of wool sold per year, this translates into the Symons family earning an extra $60–70,000 per annum in wool sales.

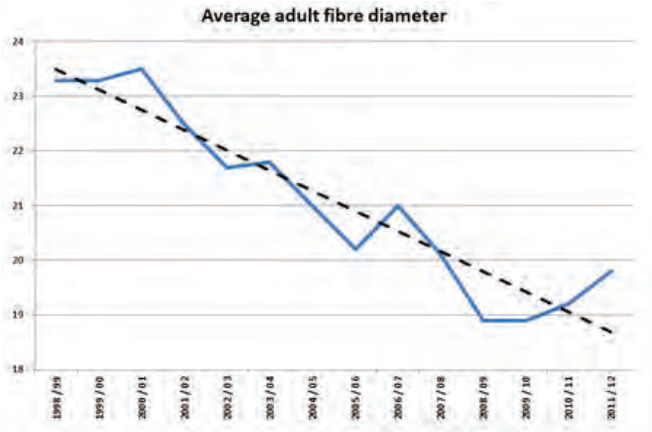

Figure 7. Average adult fibre diameter (μm) over time

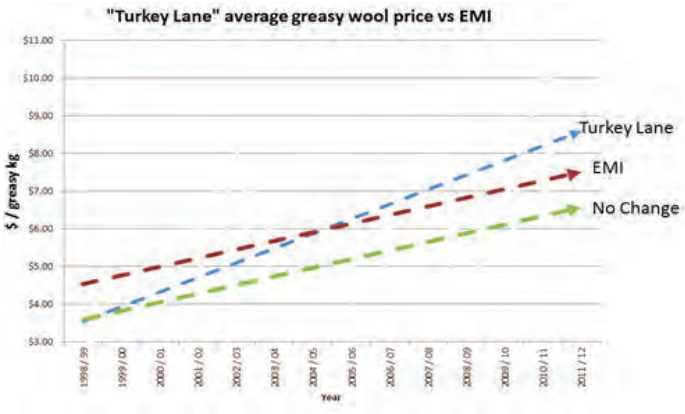

Figure 8. Eastern Market Indicator (EMI) price per greasy kg, Turkey Lane wool price per greasy kg versus no change (price expectation based on historic trend)

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"These improvements are also seen in wool flock income per hectare where returns have improved 400% in 13 years (Figure 9).

"The actual gross farm gate income that the Symons family received in 2012 was $925 per ha and yet people say that you can't make money out of wool; they say it's a dying commodity," Greg said.

Figure 9 also highlights that the income trend line for this property is increasing at such a rapid rate that there is a divergence away from the cost line, allowing greater profits and avoiding the cost price squeeze experienced by so many in the industry. The costs are inclusive of direct costs and overhead costs, which includes wages for both staff and John. The estimated total additional income from the management and genetic changes earned by the farm from wool and sheep sales is $85-95,000 every year."

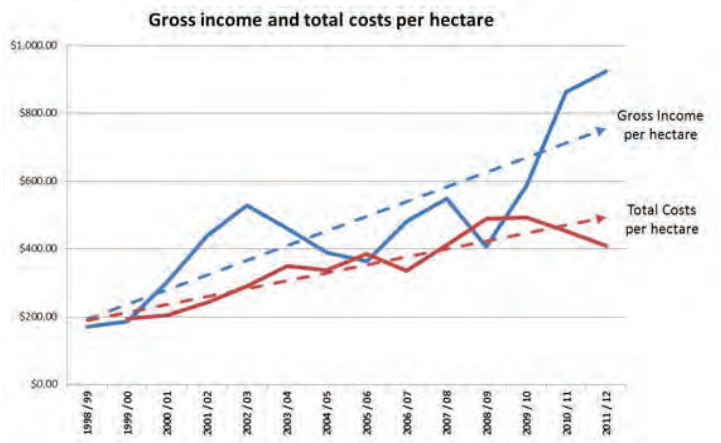

Figure 9. Gross income and total costs per hectare per year (solid lines), the dashed lines are the trend lines.

"Genetic improvement is cumulative, so it's there every year and most of it ends up as profit as it doesn't cost you any more to run those more productive sheep," Greg said.

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Ram Breeding Flock

In 2000 the top 200 commercial ewes were selected based on measurement (within group index selection) and desirable physical attributes to form the ram breeding nucleus. These ewes were then artificially inseminated to four industry sires that were the highest ranking, based on the new Turkey Lane flock breeding objective. These rams were identified from an across-flock genetic evaluation service that has since evolved to become MERINOSELECT.

An intensive measurement and recording program commenced for the progeny born into the nucleus flock. This involved full pedigree records, birth type, date of birth, and a suite of wool measurements including fleece weight, micron and staple strength. Progeny were also scored for important visual attributes such as feet, jaw, wool colour and character, wrinkle and fleece rot susceptibility. Finally, a worm egg count was recorded to help identify animals that might be more naturally resistant to worms.

The measurements and relevant records were sent to MERINOSELECT which produces Australian Sheep Breeding Values (ASBVs) and supply the FP+ index. After measurement and assessment, Greg and John cull any sheep that are poor based on visual assessment, and then return to the flock to make their final ewe and ram selections.

Final selections are based on index performance but with an additional consideration of resistance to worms. The top ewes are allocated to the annual AI program and the lower performers are joined to the top Turkey Lane bred sires.

"What we are finding now after 13 years of this program is that it's getting harder to find industry sires that will perform better than those we are breeding at Turkey Lane," Greg said.

Figure 10 shows the genetic progress for the Turkey Lane ram breeding flock for economically important traits. The charts show Turkey Lane ahead of the fine-to-medium industry wool average for fleece cut and fibre diameter, as well as making significant gains in staple strength, bodyweight and parasite resistance.

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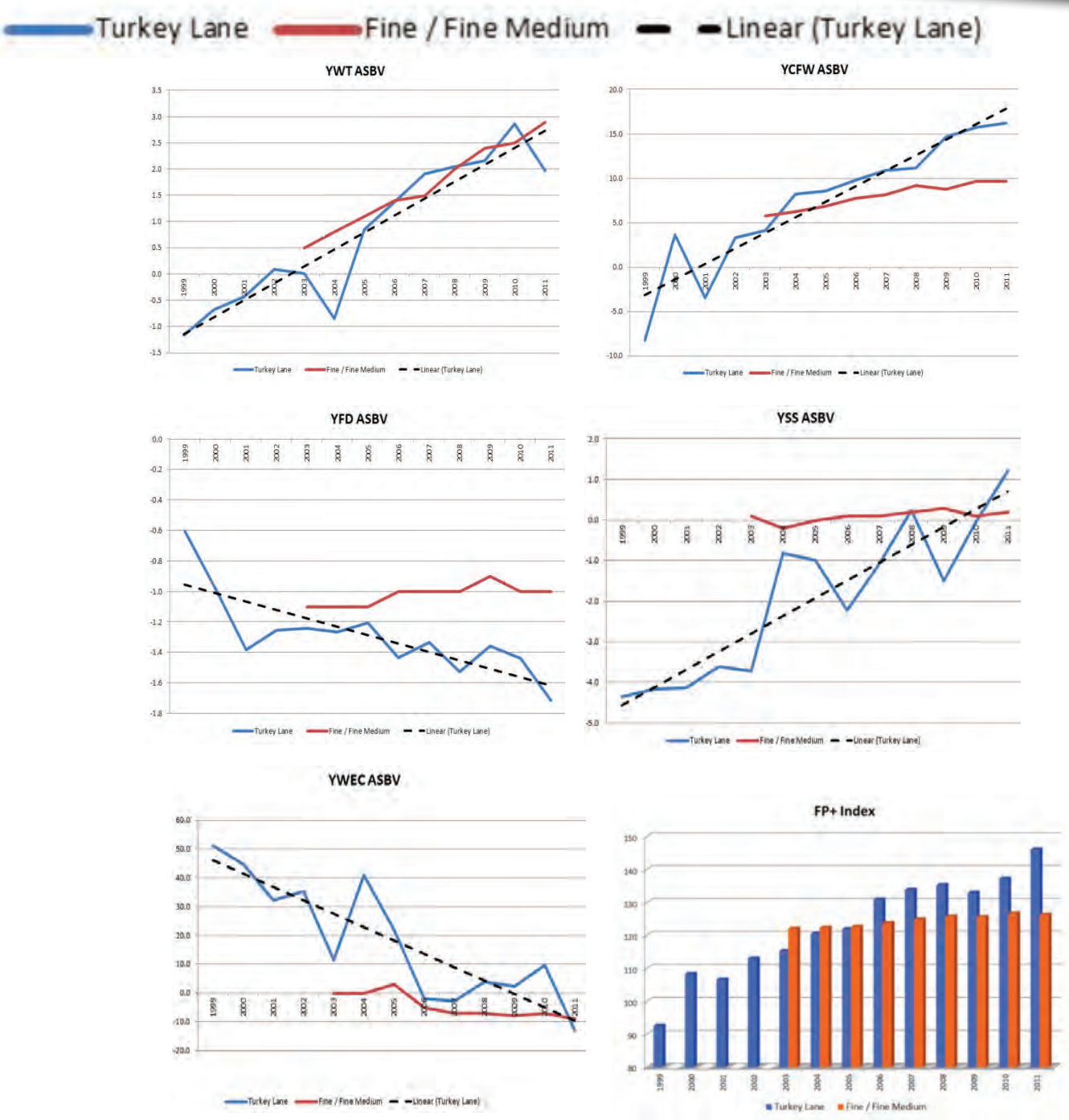

Figure 10. Genetic trend charts for Turkey Lane and the fine/medium industry average, based on Australian Sheep Breeding Values (ASBV) where Y is yearling, WT is body weight, CFW is clean fleece weight, FD is fibre diameter, SS is staple strength, WEC is worm egg count and FP+ is the Fibre Production Plus index.

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Turkey Lane is showing that using a selection system based on ASBVs and the FP+ index produces real financial gains. From a flock that started at over 24 µm, Turkey Lane sires are now found in the top 1% of industry based on measured performance and the FP+ index. In 2013, the top home bred sire was ranked third in Australia for FP+.

With genetic gains set to continue and a management system in place to maximise genetic potential, the Symons family are now in a position where some of this profit can be reinvested into further property improvements.

"There are 260 working days in a year. John and Jo take a month off to travel overseas, so there are 240 week days that they can work on the property. Looking at the profit figure of $525/ha from 530ha in 2012, every day that John worked in his sheep enterprise he was paid both a wage and $1,160 in profits. That's a business I'd like to own!"

The Future

Both Greg and John know that there is still the opportunity to make further genetic and management progress. Turkey Lane bred sires continue to provide a rapid rate of progress. The selection system to improve the commercial ewe flock that was instituted in 1999 continues to provide a cost-effective strategy to make strong improvement in the commercial flock. This system is being introduced to the wether flock to obtain the same benefit.

"Yes," Greg said, "I am very confident the flock will continue to make rapid genetic and productivity improvement."

Photo: John and Jo Symons, "Turkey Lane", Parndana, Kangaroo Island

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