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Differences in productivity between flocks a comparative study in the Pilbara

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a comparative study in the Pilbara

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**Pastoral Inspector, Karratha,
and the Roebourne-Port Hedland
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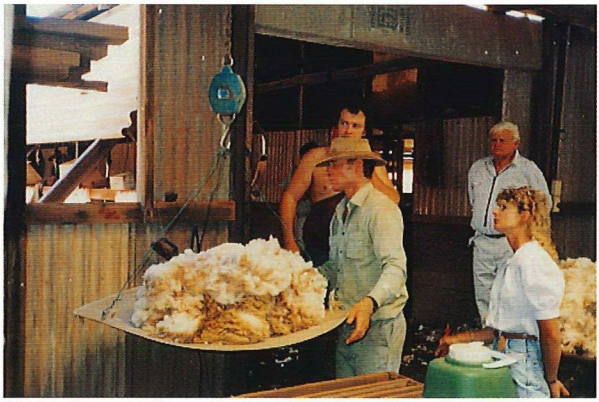
To learn more about their own flock productivity relative to other flocks in the district, ten woolgrowers in the Roebourne-Port Hedland Land Conservation District conducted a small wool growing competition from November 1989 to November 1991. They compared the wool production from 20 young wethers drawn from their flocks.

Karratha Station hosted the competition; Mark Godlonton (Karratha Station Manager) and John James were joint organisers.

DESIGN AND MEASUREMENTS

Twenty two-tooth wethers were selected at random from each of the ten Pilbara properties (200 head total) and identified with numbered ear tags. They were then moved to Karratha Station, released into one paddock and allowed six weeks to acclimatise before any measurements were taken.



Mark Godlonton (Manager, Karratha Station) weighing the fleeces

The competition started in November 1989 with all wethers being shorn, dipped, weighed and returned to the paddock. A year later, in November 1990, they were mustered, shorn, dipped and weighed again (Table 1).

The greasy fleece weight for each wether was recorded. A mid-side grab sample (0.5 kg) was taken from each fleece, sealed in a plastic bag and sent to Perth for measurements of yield and mean fibre diameter. These data were used to estimate a clean fleece weight for each sheep.

A skilled wool valuer used the mean fleece characteristics for each mob of 20 wethers to estimate the value of their wool in cents per clean kilogram. From this the fleece value for each sheep and the average fleece value for each mob were calculated.

Running the animals together in one paddock under the same conditions showed up any genetic variations in productivity between the animals; the differences were then quantified in monetary terms. This variation could then be related to different flock management strategies on the stations of origin.

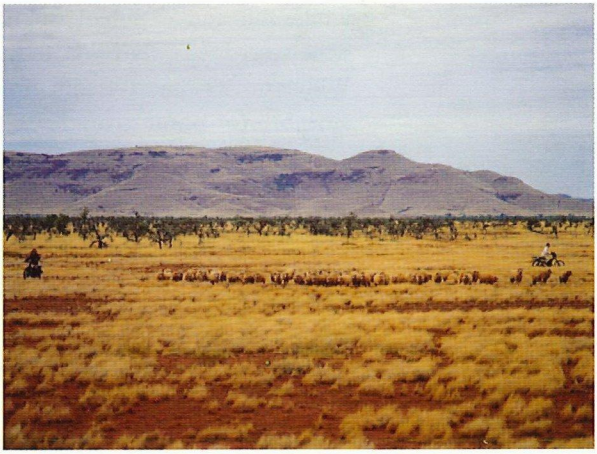
Carcase values were estimated using liveweights and condition scores. Thus an average total value per animal (wool and meat) at shearing in 1990 and 1991 was determined.

This procedure was repeated in November 1991 (Table 2). At the end of the study, the sheep were either returned to their owners, or sold privately; the proceeds were donated to the Port Hedland School of the Air Parents and Citizens Association.

PADDOCK CONDITIONS

The 2,000 ha study paddock has four permanent watering points.

About half the area supports a tussock grassland of Roebourne plains grass (*Eragrostis xerophila*), with soft spinifex (*Triodia pungens*) found on 40 per



Mustering the competition flock in 1990

cent. The remaining 10 per cent consists of unpalatable, hard spinifex vegetation and unproductive, stony plains. Both the Roebourne plains grass and the soft spinifex pastures have moderate to high pastoral potential, although nutrition in dry times is limited. The overall stocking rate used was one sheep to 10 ha, as recommended for these vegetation types.

Seasonal conditions before the study began were favourable. About 200 mm of rain fell in winter 1989, and 150 mm in the summer of 1989-90. This equated to 60 days suitable for winter plant growth and 32 days suitable for summer plant growth.

The next year, 1990, was a dry year, with no effective winter rain and 50 mm of rain in the 1990-91 summer, which provided only 10 days suitable for plant growth. Winter in 1991 had 100 mm of rain, producing 45 days suitable for plant growth.

Results

Average fleece data and carcase values for the ten mobs of wethers are given in Tables 1 and 2. Average wool cut per head over all 200 wethers fell slightly, from 4.21 kg per head in 1990 to 4.14 kg per head in 1991. Average fibre diameter increased from

21.71 microns in 1990 to 22.36 microns in 1991. Average clean fleece weight dropped by 0.35 kg, from 2.72 kg in 1990 to 2.59 kg in 1991.

In 1990, the maximum fleece value per head (average for a mob) was estimated as $29.77, and the minimum value was $16.21, or 54 per cent of the maximum value. Lower wool prices in 1991, combined with a general increase in fibre diameter, reduced the maximum mean fleece value to $18.66 and the minimum value to $10.76, 58 per cent of the maximum value.

Table 1. Average wether wool production and estimated carcase values at shearing in November 1990

Station	Greasy fleece weight (kg/head)	Yield (%)	Estimated clean fleece weight (kg/head)	Fibre diameter (microns)	Estimated clean fleece value (cents/kg)	Fleece value ($)	Body weight (kg)	Carcase value ($)	Total value ($)
1	**5.14**	**68.5**	**3.52**	**21.4**	**846**	**29.77**	**39.5**	**7.11**	**36.88**
2	**4.86**	**69.1**	**3.34**	**21.7**	**810**	**27.05**	**41.1**	**7.39**	**34.44**
3	4.31	68.2	2.93	21.8	800	23.44	39.8	7.16	30.60
4	4.00	62.9	2.51	20.6	964	23.74	38.0	6.84	30.58
5	4.53	66.2	3.01	22.0	779	23.44	39.5	7.11	30.55
6	4.14	61.9	2.56	21.8	800	20.48	37.9	6.82	27.30
7	3.82	61.9	2.36	21.6	820	19.55	38.8	6.98	26.53
8	4.13	60.7	2.49	21.9	789	19.64	34.3	6.17	25.81
9	3.69	61.3	2.27	21.8	800	18.16	36.9	6.64	24.80
10	3.44	63.3	2.18	22.8	744	16.21	36.0	6.48	22.69
Average	4.21	64.4	2.72	21.7	815	22.15	38.2	6.87	29.02

Table 2. Average wether wool production and estimated carcase values at shearing in November 1991

Station	Greasy fleece weight (kg/head)	Yield (%)	Estimated clean fleece weight (kg/head)	Fibre diameter (microns)	Estimated clean fleece value (cents/kg)	Estimated greasy fleece value (cents/kg)	Fleece value ($)	Body weight (kg)	Carcase value ($)	Total value ($)
1	**5.01**	**61.8**	**3.31**	**22.2**	**564**	**348**	**18.66**	**50.26**	**4.02**	**22.68**
2	**4.90**	**63.8**	**3.35**	**23.1**	**538**	**343**	**18.02**	**52.06**	**4.16**	**22.18**
3	3.80	60.3	2.30	21.3	600	362	13.80	46.60	3.72	17.52
4	4.41	64.6	2.66	22.5	550	355	14.63	50.2	4.00	18.63
5	4.50	61.9	2.80	22.5	550	341	15.40	46.75	3.74	19.14
6	4.00	61.5	2.51	22.3	560	344	14.05	47.75	3.82	17.87
7	4.25	58.5	2.46	22.7	545	319	13.40	47.10	3.76	17.16
8	3.25	59.5	2.21	21.6	590	351	13.03	47.53	3.80	16.83
9	3.72	60.6	2.31	22.3	560	339	12.93	46.66	3.73	16.66
10	3.56	59.7	2.00	23.1	538	322	10.76	42.84	3.42	14.18
Average	4.14	61.2	2.59	22.4	559	342	14.47	47.77	3.82	18.29

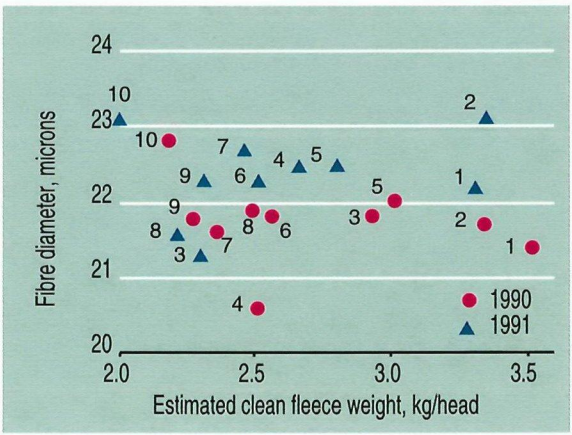


Figure 1. Average fleece weight and fibre diameter are not generally related

The weight of the wool produced was not generally related to the fibre diameter (Figure 1). The wethers from Station 1, which were the heaviest cutters in both years, had a lower than average fibre diameter in both years. However, in 1990, the sheep that were the lightest cutters grew the broadest wool.

Body weights were higher in November 1991, after the favourable winter, than in November 1990, after a year with little or no effective forage growth.

The rankings in productivity were consistent between the years (Figure 2).

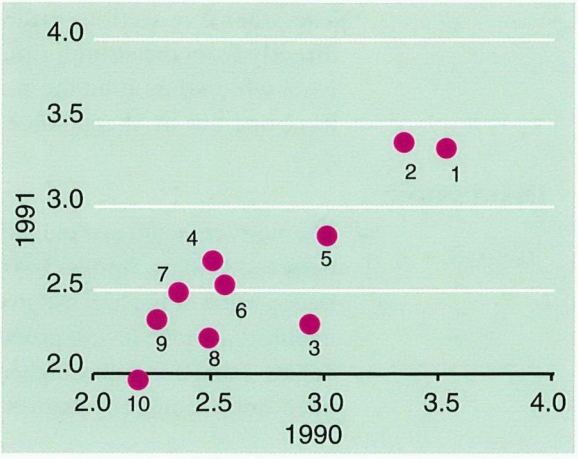


Figure 2. Clean fleece weights for the ten stations in two years

The mobs from Stations 1 and 2 ranked first and second in both years and the mob from Station 10 was the poorest performer in both years. The sheep from Stations 1 to 5 were sired by rams imported from outside the Pilbara, whereas those from Stations 6 to 10 were sired by rams bred on the home station.

Costs were analysed to establish the value of purchasing rams for a Pilbara sheep flock. The five stations that bought rams paid up to $150 per ram and provided supplementary feed for those rams. The estimated cost of managing an introduced and supplemented ram flock was $1.12 per fleece for sheep grown on the property.

The other five stations either bred their own rams directly from the station flock or used bought rams from which they bred their own rams. One station has gone out of sheep since 1989.

Discussion

The study revealed marked differences in productivity between Pilbara flocks. In both years, the average fleece value of the highest producing mob was nearly double that of the lowest producing mob. Importantly, Tables 1 and 2 show that higher average fibre diameters need not accompany high wool production.

For the flocks with lower than average productivity, raising the genetic quality of the flock can improve wool production. Introducing superior rams will achieve this most quickly, but there is the disadvantage that imported rams find the Pilbara a difficult environment unless given special attention. Further, past work has shown that locally-bred rams are more fertile than imported rams. Therefore in deciding on the best strategy, producers must weigh up genetic advantages gained from using superior imported rams against the higher fertility and lower losses experienced with locally-bred rams.

Conclusions

- Wide variation in the productivity of flocks in the Pilbara was revealed by this study.
- The producers involved were able to determine for themselves if their breeding programs were producing adequate rewards in flock performance.
- The results can be used to determine management changes that will lift the performances of the lower producing flocks.
- The study design described here is recommended for other pastoral areas as a way to generate interest and awareness in the importance of flock breeding and management.

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