Grow more wool

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The amount of wool each sheep produces depends partly on its genetic ability to grow wool—an ability which is strongly inherited.

Studs can make an accurate selection of rams which are superior as wool producers by using fleece measurement as an aid to selection.

The commercial wool grower makes gains when he buys his rams from a Merino stud which uses fleece measurement.

By W. L. McGARRY, Officer in Charge, Sheep and Wool Section, and R. J. LIGHTFOOT, B.Sc. (Agric.), Sheep and Wool Adviser

The amount of wool that each sheep grows is determined by many things, including the amount and quality of pasture available or how the sheep are fed, the stocking rate, the general health and thrift of the sheep and other management considerations such as cropping and the time of lambing.

Over all of these things the wool grower has some degree of control. He can increase his stocking rate to increase wool production per acre or he can increase the area under crop and reduce the number of sheep carried.

But there is one important factor over which the wool grower has very little influence—the genetic ability of his sheep to produce wool. Thus on the same pasture, under the same conditions, grower A's flock can produce more wool per head than that of grower B, simply because his flock is genetically superior with regard to wool producing ability.

Selection and Heritability

The rate of genetic progress achieved by a stud breeder depends on the judicious and accurate selection of breeding stock from the general flock. The selected animals must themselves be superior, as wool producers, to those from which they were selected, if progress in wool weight is to be achieved.

Their superiority will depend on the number selected. For example if 10 rams are selected on high fleece weight from a flock of 100, their average fleece weight will be greater than the average fleece weight of 40 rams selected from the same flock.

Because the ability to produce wool is strongly inherited, part of the superiority of the selected parents is passed on to their progeny. This is how genetic progress is achieved. Because rams can be "culled" very heavily, that is, only a few are used in the stud as top sires, and because each ram contributes to the birth of 40 or so progeny each year, the response to any character is
much quicker when selection is concentrated on the ram side.

The commercial wool grower can do little to achieve genetic progress in his flock, as the need to maintain production and to retain adequate ewe replacements for breeding purposes, each year, severely restricts his capacity to cull all low producers and keep only the heaviest and best cutters.

Very few wool growers breed their own rams. Because of this they are dependant on progress made within the stud from which they buy their rams, to secure genetic improvement in their flocks.

**THE STUD BREEDERS' CONTRIBUTION**

Research has shown that if studs obtain accurate measurements of their rams, and use these in conjunction with selection methods already in practice, the rate of genetic gain in wool production could be doubled.

Stud breeders who have realised that such a move can contribute significantly to the welfare of the wool industry have in recent years been using fleece measurement as an aid in selecting their top sires.

Today, about 45 per cent. of the Merino rams bred and sold in Western Australia come from studs which are using fleece measurement. Improvement achieved within studs by this means is quickly passed on to the commercial wool growers who buy their rams.

Fleece measurement is becoming increasingly important as an aid to selection within the studs of Western Australia, so commercial wool growers—who are the ram buyers—should know more about its use and application.

**FLEECE MEASUREMENT—IN BRIEF**

At the 2-tooth classing, the stud breeder selects those rams which on type, conformation, wool quality, style and so on, have the desirable attributes he seeks. These 2-tooth reserve rams, so selected, are then shorn, their fleeces are weighed and a mid-side wool sample is sent to the Fleece Measurement Laboratory for further testing.
In the laboratory, the per cent. yield is determined and from this the actual amount of clean wool each ram has grown is calculated. In addition the skilled laboratory staff makes measurements on staple length, quality number and also comments on wool style.

These measurements and comments are then returned to the stud breeder in the form of a Flock Testing Report which ranks the tested rams in order of clean wool weight.

A typical report is shown below.

Back in the classing race or shed, this report is a very valuable aid to the stud breeder as he selects which of these 15 rams is to be used for his own breeding purposes.

The above rams had been rigorously selected from a flock of 100, were all suitable for type, wool quality, uniformity and so on, and had been run under exactly the same conditions since birth. However, there was a difference of 4.2 lb. in greasy wool grown between the heaviest and lightest cutters (Rams 62 and 14)!

Department of Agriculture

FLOCK TESTING REPORT

15 Rams—Age, 15 months; Growth, 11 months

<table>
<thead>
<tr>
<th>Ram No.</th>
<th>Greasy Wool Weight</th>
<th>Clean Wool Weight</th>
<th>Clean Wool Weight Order</th>
<th>Above or Below Average Clean Wool Weight</th>
<th>Quality No.</th>
<th>Staple Length</th>
<th>Remarks on Wool</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>lb. 16.3</td>
<td>lb. 11.65</td>
<td>1</td>
<td>lb. +1.90</td>
<td>Sup. 60</td>
<td>in. 4.5</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>29</td>
<td>14.8</td>
<td>10.83</td>
<td>2</td>
<td>+1.08</td>
<td>Sup. 60</td>
<td>4.1</td>
<td>Good quality wool.</td>
</tr>
<tr>
<td>10</td>
<td>15.1</td>
<td>10.67</td>
<td>3</td>
<td>+.92</td>
<td>60</td>
<td>4.1</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>62</td>
<td>16.8</td>
<td>10.53</td>
<td>4</td>
<td>+.78</td>
<td>64</td>
<td>3.2</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>17</td>
<td>16.5</td>
<td>10.20</td>
<td>5</td>
<td>+.45</td>
<td>Sup. 60</td>
<td>3.9</td>
<td>Good quality wool.</td>
</tr>
<tr>
<td>31</td>
<td>15.5</td>
<td>10.11</td>
<td>6</td>
<td>+.36</td>
<td>Sup. 60</td>
<td>4.0</td>
<td>Good quality wool.</td>
</tr>
<tr>
<td>28</td>
<td>15.4</td>
<td>9.69</td>
<td>7</td>
<td>—.06</td>
<td>60</td>
<td>3.8</td>
<td>Lacks character—harsh.</td>
</tr>
<tr>
<td>59</td>
<td>14.2</td>
<td>9.55</td>
<td>8</td>
<td>—.20</td>
<td>60</td>
<td>3.9</td>
<td>Good quality wool.</td>
</tr>
<tr>
<td>46</td>
<td>15.8</td>
<td>9.41</td>
<td>9</td>
<td>—.34</td>
<td>Sup. 60</td>
<td>4.0</td>
<td>Good quality wool.</td>
</tr>
<tr>
<td>7</td>
<td>15.6</td>
<td>9.38</td>
<td>10</td>
<td>—.37</td>
<td>Sup. 60</td>
<td>4.3</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>8</td>
<td>14.4</td>
<td>9.35</td>
<td>11</td>
<td>—.40</td>
<td>60</td>
<td>4.0</td>
<td>Poor style.</td>
</tr>
<tr>
<td>20</td>
<td>13.6</td>
<td>9.10</td>
<td>12</td>
<td>—.65</td>
<td>60</td>
<td>4.4</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>33</td>
<td>12.8</td>
<td>8.79</td>
<td>13</td>
<td>—.96</td>
<td>Sup. 60</td>
<td>3.7</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>14</td>
<td>12.6</td>
<td>8.51</td>
<td>14</td>
<td>—1.24</td>
<td>60</td>
<td>4.5</td>
<td>Good quality wool.</td>
</tr>
<tr>
<td>48</td>
<td>13.2</td>
<td>8.50</td>
<td>15</td>
<td>—1.25</td>
<td>64</td>
<td>3.7</td>
<td>Very good quality wool.</td>
</tr>
<tr>
<td>Average</td>
<td>14.8</td>
<td>9.75</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Journal of Agriculture Vol 4 No 6, 1963
Ram No. 62, which cut the heaviest fleece, fell to fourth position when examined on a clean wool weight basis. Ram No. 7, which had all the characteristics of an outstanding sire, was in actual fact below the average in clean wool weight. If this ram had been used as a stud sire, genetic progress for clean wool weight could not have been achieved.

The measurements reveal that ram No. 3, who cut the third heaviest greasy fleece was in fact the best producer. By using this ram the stud will achieve the greatest possible genetic progress with respect to clean wool weight.

Most growers know that wool is valued on a clean wool basis.

By using the weight of clean wool on a ram as a measure of his breeding value, in conjunction with other characteristics, we are closely linking stud breeding, commercial wool production and wool trade practice.

PROGRESS IN THE STUD IS PASSED ON TO THE GROWER

Fleece measurement is a tool for the stud breeder, enabling him to select much more accurately and continue to make genetic progress by using the highest producers. Commercial wool growers are vitally interested in high production and while studs continue to progress in this respect, so do the commercial flocks which use their rams.

The Department of Agriculture conducts a Flock Testing Service for registered Merino stud breeders who wish to incorporate fleece measurement in their breeding programme.

Stud breeders who wish to participate in the service this year, or who require further particulars, should contact the Sheep and Wool Section, Department of Agriculture, Jarrah Road, South Perth.

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