Silage competition, 1958-59

H. G. Elliott

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IN 1957, the Australian Dairy Produce Board Pasture Improvement Committee (W.A.) sponsored a silage competition with the object of encouraging the conservation of fodder in the form of silage and ensuring that the silage made was of a quality suitable for the maintenance of high milk yields during the summer months.

The success of the initial competition led to the organisation of another in 1958. This second competition was organised on slightly different lines, and was open to farmers who used silage mainly for feeding dairy cows.

The competition was in two sections and was conducted in the following six zones:

Zones—
1. Coastal.
2. Bunbury-Donnybrook.
3. Busselton-Margaret River.
5. Manjimup-Pemberton-Northcliffe.

In Section A (Quality) the silage was judged according to the following scale of points:

| Material ensiled (Botanical Composition) | 15 |
| Maturity of herbage                     | 25 |
| Colour                                   | 15 |
| Aroma                                    | 15 |
| Protein                                  | 30 |

Total: 100 points

Section B (Workmanship in Making and Feeding) was divided into two subsections:—(1) Silage made in pits or clamps and (2) Stack silage. Material in each case could be long, baled or chopped. The scale of points in Section B was:

| Wastage | 50 |
| Method of opening | 25 |
| Convenience in feeding | 25 |

Total: 100 points

CASH PRIZES
Cash prizes of £10 and £5 respectively were given to the highest and second highest scorers in Section A (Quality) in each zone.

Prizes of £5 each were given to the top scorers in each of the two subsections of Section B (Workmanship) in each zone.

In addition, a championship prize of £25 was awarded on a separate judging, to the highest scorer in a competition open only to the zone winners in Section A.
There were 53 entries in each section of the 1958-59 competition which was judged by Messrs. H. G. Elliott, R. A. Bettanay, A. W. Hobbs, R. Sprivilis, B. Williams and A. L. Hamilton—all officers of the Dairying Division of the Department of Agriculture.

**PRIZEWINNERS**

**Championship Award.**

J. Brennan, Rosa Brook.

**Section A.**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1—</td>
<td>71</td>
</tr>
<tr>
<td>1st Brownes Ltd., Coolup</td>
<td>71</td>
</tr>
<tr>
<td>2nd D. Hodgson &amp; Son, Waroona</td>
<td>68.5</td>
</tr>
<tr>
<td>Zone 2—</td>
<td>79.5</td>
</tr>
<tr>
<td>1st M. and A. Bell, Elgin (i)</td>
<td>79.5</td>
</tr>
<tr>
<td>2nd M. and A. Bell, Elgin (ii)</td>
<td>77.5</td>
</tr>
<tr>
<td>Zone 3—</td>
<td>85</td>
</tr>
<tr>
<td>1st J. Brennan, Rosa Brook</td>
<td>85</td>
</tr>
<tr>
<td>*W. J. Woods, Rosa Brook</td>
<td>83.5</td>
</tr>
<tr>
<td>*L. Le Souef, Margaret River</td>
<td>83.5</td>
</tr>
</tbody>
</table>

* Tied for Second.

| Zone 4— | 59 |
| 1st A. Read, Winnijup | 59 |
| Zone 5— | 69.5 |
| 1st M. McDonald, Northcliffe | 73.0 |
| 2nd J. J. Littlefair, Pemberton | 69.5 |
| Zone 6— | 82.0 |
| 1st N. Barnes, Denmark (ii) | 82.0 |
| 2nd L. King, Denmark | 77.5 |

**Section B, Subsection 1 (Pits or Clamps).**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1—</td>
<td>80</td>
</tr>
<tr>
<td>Brownes Ltd., Coolup</td>
<td>80</td>
</tr>
<tr>
<td>Zone 2—</td>
<td>93</td>
</tr>
<tr>
<td>J. Shine &amp; Co., Brunswick</td>
<td>93</td>
</tr>
<tr>
<td>Zone 3—</td>
<td>84</td>
</tr>
<tr>
<td>G. C. Beard, Witchcliffe</td>
<td>84</td>
</tr>
<tr>
<td>Zone 4—</td>
<td>78</td>
</tr>
<tr>
<td>No Entry</td>
<td>78</td>
</tr>
<tr>
<td>Zone 5—</td>
<td>78</td>
</tr>
<tr>
<td>J. J. Littlefair, Pemberton</td>
<td>78</td>
</tr>
<tr>
<td>Zone 6—</td>
<td>96</td>
</tr>
<tr>
<td>L. M. and D. C. Jones, Albany</td>
<td>96</td>
</tr>
</tbody>
</table>

**Section B, Subsection 2 (Stack).**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1—</td>
<td>78</td>
</tr>
<tr>
<td>J. Phillips, Coolup</td>
<td>78</td>
</tr>
<tr>
<td>Zone 2—</td>
<td>82</td>
</tr>
<tr>
<td>M. and A. Bell, Elgin</td>
<td>82</td>
</tr>
</tbody>
</table>

**JUDGES’ COMMENTS**

**H. G. Elliott—Championship.**

The silage which received the championship award was a mixture of subterranean clover and annual grasses submitted by Mr. J. Brennan of Rosa Brook.

It was harvested rapidly by a flail-type forage harvester and stacked in a shallow pit. No prior wilting of the green material was carried out and results indicated that sufficiently high temperatures were not obtained during making. However, the analysis showed high protein (21.2 per cent.) in spite of a high moisture content of 82.5 per cent.

On opening, the pit showed only a small amount of external wastage. As the type of harvester used precluded any great height being obtained in the stack, the maximum depth of silage in the centre was about 20 in. The colour varied from light brownish-yellow to greenish-yellow. Generally, the aroma was of an acetic acid type with a tendency towards a putrid aroma at the top and bottom of the pit.

Mr. Brennan said that all stock ate the silage readily, cows being fed approximately 60 lb. daily.

**H. G. Elliott—Zone 1 (Coastal).**

Of the three entries received in this zone, two were stacks made of long material and one a clamp with chopped material.

The material ensiled in all three entries consisted of subterranean clover, either mid-season or Yarloop, together with annual grasses including Wimmera ryegrass. In one case some oats were included in the mixture. It was obvious that the swards used in two entries were not uniform as many weeds were present.

Two entries were made from material which was cut too late as the grasses were over-mature. Two samples analysed
showed high moisture content of the silage due to the lack of wilting prior to ensiling. Excessive drying together with lack of sufficient compaction during making caused some over-heating in one entry.

With all three silages judged, the colour was not good and great variations occurred through the individual lots. Aroma varied considerably and none could be considered good.

The amount of wastage on the tops, sides and bottom was too high in every case and there was evidence in all entries that the finishing off was not given sufficient time. Lack of proper consolidation and sealing was obvious. Opening generally was done with a knife and too large an area exposed to spoilage. Feeding out was on the ground with the consequence that considerable losses occurred from both operations.

It is obvious that more care and attention is essential by all farmers when making and feeding out this valuable material.

B. Williams—Zone 2 (Bunbury-Donnybrook).

The competition results emphasised the necessity for adequate compaction and the exclusion of air to avoid mould growth. Mouldy silage is not a satisfactory feed for stock and the high percentage of waste in many stacks made them uneconomical in feed and labour costs.

The advantages of the forage harvester over the mower were particularly marked. The initial crushing effect of the forage harvester enabled better and more even packing of the material in the stack.

Cutting the silage on a face and feeding out away from the stack was obviously worthwhile as an economy feature, and self-feeding methods were not successful.

There appeared to be definite advantages in baled silage if it could be stacked so that there was no interlocking of the bales when the stack subsided. In this case the bales could be removed evenly on a face.

Farmers expressed appreciation of the opportunity afforded by the competition for discussing silage making and other phases of feeding and management.

All farmers stated that they will make silage again in 1959. Even those whose entries were criticised freely, appreciate the advantages of feeding silage in mid-summer to prolong lactation; or in autumn before the new growth of pasture to make earlier calving possible. Farmers who have scored poorly are confident that much improvement can be achieved.

A. L. Hamilton—Zone 3 (Busselton-Margaret River).

As would be expected, considerable variation in composition was noted. Some entries were obviously cut from inferior pastures containing a relatively large proportion of silver grass, brome grasses, Yorkshire fog and other inferior species. These were low in protein according to analyses, and mature oats in two entries also gave low protein figures.

On the other hand the highest protein figures were obtained in silage made from highly productive pastures comprising 50:50 sub-clover and ryegrasses, or 40:60 sub-clover and mixed grasses including ryegrass, kikuyu, paspalum, etc.

While cutting a deteriorated pasture for silage is an excellent way of controlling seed formation of the less desirable species it is important to remember that the quality of the silage, from the point of view of protein content, is closely linked with the quality of the material ensiled.

With only one exception, which was a “late” paddock, all entries were cut within the period October 20 to November 6. Even within this short period considerable differences in moisture content were encountered, ranging from 70.7 per cent. to 83.0 per cent. This wide range would indicate that a marked variation occurs in the stage of maturity of pastures and that it is necessary to study each paddock closely in order to cut at the best stage of growth.

It is of interest to note that the silages which contained 81 per cent. to 83 per cent. moisture (six samples) contained an average of 16.5 per cent. protein; 75 per cent. to 80 per cent. moisture (five samples) averaged 14.9 per cent. protein, and 70 per cent. to 75 per cent. (four samples) averaged 12.1 per cent. protein.

These figures seem to show that high protein is obtained by cutting pasture while the moisture content is still high i.e. before the plants fully mature and commence drying out.

The best entry in Section B (1) was a pit of material cut in mid-November from a late paddock using a forage harvester. The
Fig. 2.—Side and end views of one of the popular wedge-shaped silage stacks

depth of material in the pit when inspected in May was a little over three feet, and the top surface which was covered with soil after compaction revealed not more than 1½ in. of waste when the soil cover was removed.

The best entry in Section B (2) was a stack of long material gathered with a buckrake and the prevention of waste by using a topping of lush material to seal the stack was exemplified in this silage. The silage itself was very uniform and care was obviously used in making to ensure even compression over all portions of the stack. Wastage at ground level was practically nil.

There was evidence, however, in other entries, that farmers had "hastened too quickly" in the actual building of the stack, whether above or below ground level, and that more attention to spreading and levelling the material between loads would have repaid the extra time and effort.

Perhaps the major cause of waste was the failure to satisfactorily seal the stack from the air in order to prevent mouldiness and drying out. In several instances at least 9 to 12 in. over the whole surface of the silage was quite useless, which considerably reduces the proportion of nutritious material available for feeding out.

A. W. Hobbs—Zones 4 and 5 (Bridgetown-Nannup and Manjimup-Pemberton-Northcliffe).

Although only two entries were judged in Zone 4 and four in Zone 5, more farmers in these areas are making silage than in previous years. The majority are sheep and fat stock raisers and did not enter the competition.

In these areas, the quality of the silage is apt to be governed by the availability of contract machines and labour, also the weather conditions at the time of silage making. Late arrival of the contractor can lead to the ensiling of over-mature material.

Entries in these two zones included bun stacks with material both mown and forage harvested. A trench silo filled by means of a buckrake and another in which forage harvested material was dumped and spread with a drag fork were successful in gaining awards.

Lack of adequate consolidation and faulty sealing led to considerable wastage in some instances.

Most competitors fed out the silage by cutting it into slabs with a hay-knife or broad-axe, forking it on to a trailer and then forking it off into the paddocks from behind a slowly-moving tractor. Several farmers in this area (not competitors) tried self-feeding the silage using moveable feeding racks or electric fences but the wastage was heavy in each instance.

R. Sprivulis—Zone 6 (Albany-Denmark-Walpole).

There were 17 entries in Zone 6 and the quantities of silage conserved in single pits or stacks varied considerably, the maximum being 60 tons. The largest quantity made on one farm was 110 tons.

The winning entry consisted of an almost pure stand of mid-season sub-clover

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The winning entry consisted of an almost pure stand of mid-season sub-clover
with only a very small admixture of annual grasses and a few dock plants. The clover was at the early flowering stage when cut.

A wedge-shaped stack was built on a hillside using the buckrake for carting the material which was then consolidated by using the tractor in a herringbone pattern.

A layer of succulent subclover was used to seal the top layer, being rolled into a well-compacted layer two to three inches thick. The wastage on this stack did not exceed 8 per cent. and occurred mainly along the sides.

Most entries in this zone suffered through failure to allow succulent clover time to wilt before being ensiled. This resulted in a rather wet and putrid-smelling silage. Where grasses predominated, the consolidation was usually insufficient.

Surface sealing was not done properly by a majority of farmers and initial losses of 20 per cent. due to moulds were very common. Where more care was taken in compaction and surface sealing, losses did not exceed 8 per cent. Old bags were spread over the top of a stack and covered by 6 in. of sand by one farmer. At feeding out time, each bag could be removed separately taking the soil cover with it. This practice gave good results.

Succulent sub-clover also gave good results as sealing material being quite as effective as the use of bags and soil. In each instance, the initial losses did not exceed 3 in. on the surface. On the poorly compacted and badly sealed stacks, initial losses went as deep as 2 ft. 6 in. on the surface. No excessive losses were observed in pit silage.

One farmer at King River baled his silage material and ensiled the bales in a trench, covering them with soil by the use of a blade attached to the front of his tractor. This method of sealing was simple and effective.

For feeding out, the soil was removed by the tractor and blade. The handling and rationing of the baled silage was much easier than when handling loose material, whether this was long or chopped.

**GENERAL COMMENTS**

It is obvious from discussions and watching farmers’ operations that the forage harvesters speed up the work of making silage but the problem of transport of the material harvested must be worked out before the full advantage can be obtained from the machines.

Much discussion has taken place among farmers and others concerning the effect this method of harvesting green material may have on the quality of the silage, but it can be generally stated that the chopping and lacerating action of these machines seems to have a beneficial effect on the quality of the silage, if the moisture content of the material is right, and the control of temperature, method of packing, and consolidation are correct.

From the results of this competition it would appear that more care and attention should be given to the following points when making this very valuable material:

(a) Cut at the time when the bulk of the material is at the early flowering stage.

(b) With forage harvesting machines try not to harvest when surplus moisture is present on the green material, and so avoid excess moisture in the silage.

(c) Wherever possible wilt very green material to reduce moisture if possible to 70-75 per cent. and not 80-84 per cent, as frequently found in silage.

(d) See that the correct temperature is obtained in the early stages of making the silage. Temperatures of between 100-115 F. should be obtained and maintained during making.

(e) Greater care should be taken to avoid excess wastage on the sides and tops of clamps, pits and stacks by better attention to filling and finally sealing off. Where adequate sealing of the top of the silage with very lush green well-rolled material is not possible, earth should be applied.

(f) Better packing with forage harvester material must be practised to avoid excessive wastage.

(g) Do not expose too great a surface area when feeding out during the summer, as this causes drying out and further wastage.
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