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HIGH STOCKING RATE ON KIKUYU DAIRY PASTURE

Progress report on grazing trials on Kikuyu-sub. clover pasture at Denmark Research Station

By F. E. RYAN, B.Sc.(Agric.)Hons., Agrostologist, Dairy Division

KIKUYU is one of the most valuable pasture plants on dairy farms in the South-West of Western Australia. It combines well with subterranean clover and ryegrass if heavily stocked, and pastures managed in this way can be cut for legume-grass hay in the spring. However, relatively little is known of its carrying capacity or potential for production under grazing.

To evaluate the capacity of a dry land kikuyu-sub. clover pasture to maintain dry, unmated adult Guernsey cows an exploratory trial was conducted on 10 acres of pasture at Denmark Research Station during the 12-month period to September, 1967. The stocking rate was one beast per acre.

The site chosen was a hill slope of Wakundup gravelly sand, cleared and pastured 28 years previously. The pasture consisted of kikuyu, perennial and annual ryegrass, Mt. Barker sub. clover and volunteer annuals. It had received annual applications of superphosphate and, when required, copper, zinc and potash.

Fertiliser applications in 1966 were 2 cwt. of superphosphate and 1 cwt. of muriate of potash per acre in autumn and 1 cwt. of superphosphate per acre in August. In autumn, 1967, all paddocks received 2 cwt. of superphosphate; paddocks cut for hay in 1966 received 1 cwt., and others 31 lb. of muriate of potash per acre. In August, 1967, all paddocks received 1 cwt. per acre of superphosphate.

Maintenance of body weight of the cattle was used as a measure of pasture utilisation in this trial because it gives a reasonably constant figure which may be related to other forms of animal production. However, a dairy cow in production needs a much greater daily intake than an animal which is only being maintained, and this must be taken into account in computing pasture utilisation by dairy cows from maintenance grazing results.

In September, 1966, 10 unmated dry Guernsey cows of 1,100 lb. liveweight were put into five two-acre paddocks. The paddocks were rotationally grazed, with three days grazing and 12 days spelling. In spring, two paddocks were closed for hay, 14 days apart, and each was cut eight weeks after closing. Grazing pressure was increased on the remaining paddocks.

Girth measurements were used to estimate liveweight until November, 1966, when mobile scales became available. The animals were weighed at 28 day intervals.

Pasture yields were measured in December, May, July and September by cutting one inch above ground level. Samples were taken for measurement of botanical composition.
Results

The animals were in good condition when the trial began in September and by December they were very fat. Weights fell sharply from March 9 to April 5 and 4 lb. of hay was fed a day from April 14. Hay feeding was stopped on May 15, after the animals had begun to gain weight. Liveweights increased during May, June and July, fell slightly in August and were constant in September.

The pattern of weight changes was remarkably similar for all cows, as indicated by the average, heaviest and lightest weights given in the graph below. The shaded area represents the period during which hay was fed.

The animals were easily maintained on kikuyu-sub. clover pasture for a full year, at a stocking rate of one large dry beast per acre.

At this rate of stocking the pasture was maintained as an excellent mixture of kikuyu, sub. clover and ryegrass.

The summer of 1966-67 was dry and warm after December, but the kikuyu continued to produce green shoots. After the autumn rains commenced in mid March, pasture growth was excellent until July and August, when it slowed down because of wet conditions. Growth rate again improved in September and October.

Kikuyu made its greatest contribution to the pasture in autumn, early winter, late spring and summer; it produced green shoots for most of the year, including the dry summer, when production continued at a reduced rate. The clover and ryegrass were strongest in the winter and spring.

<table>
<thead>
<tr>
<th>Month</th>
<th>Dry matter</th>
<th>Botanical composition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cwt./acre</td>
<td>kikuyu</td>
</tr>
<tr>
<td>December, 1966</td>
<td>3.02</td>
<td>84</td>
</tr>
<tr>
<td>May, 1967</td>
<td>3.94</td>
<td>68</td>
</tr>
<tr>
<td>July, 1967</td>
<td>1.86</td>
<td>66</td>
</tr>
<tr>
<td>September, 1967</td>
<td>2.44</td>
<td>18</td>
</tr>
</tbody>
</table>

One two-acre paddock was cut for hay on October 26 and another on November 8, 1966, each eight weeks after the last grazing. Hay yields were 69.3 cwt. and 85.7 cwt., giving 7.75 tons from four acres. Of this, 11.85 cwt. was fed, leaving a surplus of 7.15 tons or 0.715 tons per beast.

Pasture yields were lower from these hay paddocks during the following autumn and winter than from the other paddocks.

The fat condition of the stock throughout this trial and the fact that a large reserve of hay was unused indicated that
a much higher stocking rate would have been possible in this year. Until higher rates are tested it is not possible to give a reliable estimate, but from considerations of unused hay and the daily feed requirement of animals of this size, a potential carrying capacity of at least one beast to 0.8 acres is indicated.

The importance of seasonal conditions must not be overlooked. In the 1966-67 season the summer was drier and warmer than average, reducing summer production from kikuyu; the winter months July and August were wetter than usual, retarding winter growth. However, autumn rains were early and substantial and autumn-winter growth was better than normally expected. Continuation of similar trials in other years is desirable to evaluate the effect of season.

The kikuyu grazing trials were continued during 1967-68 with producing Guernsey cows grazed at the rate of one milking cow per 1.75 acres for 12 months on the paddocks used in the above trial.

Acknowledgments
I am indebted to the Manager and Staff of the Denmark Research Station for their assistance and suggestions.
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