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CATTLE STOCKING RATES IN A HIGHER RAINFALL AREA

By R. SPRIVULIS, B.Sc. (Agric.), Agricultural Adviser, Albany

THE 1965 Pardelup cattle stocking rate trial was conducted with Hereford cross yearling steers on annual pasture of Mt. Barker sub. clover, Wimmera ryegrass and various volunteer annual species. This was topdressed with 186 lb. of superphosphate per acre in mid March.

The 1965 trial started on January 6, when three groups of six steers each were placed in their paddocks, where they remained for 345 days without supplementary feeding. The stocking rates were:

A. High—1 yearling per 1.1 acres.
B. Medium—1 yearling per 1.5 acres.
C. Low—1 yearling per 1.9 acres.

All animals were drenched with thiabendazole soon after the break of the season. The cattle were weighed and the pastures sampled at four-weekly intervals. Botanical composition of the pasture was determined at the beginning and end of the trial.

In 1965 the Pardelup Prison Farm had one of its best growing seasons for many years. Germinating rains fell on March 25 and follow-up rains were good; 2,800 points fell during the growing season from the end of March to the beginning of December and total rainfall for the year was 3,263 points.

PASTURE GERMINATION, APRIL, 1965

Left.—High stocking rate treatment. There is relatively little dry feed on the ground and a good germination of sub. clover is taking place.

Right.—Low stocking rate treatment. A thick layer of dry grass remains on the surface and germination is largely of volunteer grass species.
The amount of feed available (dry matter above ground level) was clearly influenced by season and stocking rate. Table 1 sums up the feed situation at the start of the trial (early January), at germination (late March), the start of the spring flush (mid. August) and the end of the trial (mid. December).

At each stocking rate there was more feed in the paddock at the end of the trial than at the beginning, and the amount of pasture present never fell below 1,000 lb. (dry weight) per acre on any treatment. In this particularly good season all treatments were understocked for most of the year.

Between the start of the trial and the autumn germination, consumption and invisible losses (weathering, decay, etc.), accounted for 71 per cent. of dry feed under the high stocking rate, 58 per cent. under the medium stocking rate and 48 per cent. under the low stocking rate. Little old feed was eaten after germination, so it can be assumed that under the high stocking rate from a quarter to a third of the dry feed was wasted, and under the low stocking rate as much as half the dry feed was lost.

The season and the light grazing favoured grass dominance and a decline in clover content. Subterranean clover declined from 70 per cent. in January to 27 per cent. in December, Wimmera ryegrass increased from 10 per cent. to 22 per cent. and volunteer grasses increased from 24 per cent. to 45 per cent. of the total pasture dry matter.

The effect of stocking rate on pasture composition is shown in Table 2.

### The Pardelup Stocking Rate Trial with Increased Stock Numbers

The Pardelup stocking rate trials were started in 1964 at Pardelup Prison Farm, in a 30 to 35 in. rainfall district. In the first year’s trial (reported in the March, 1966 issue of the “Journal of Agriculture”) the heaviest stocked paddock, carrying one yearling to 1.3 acres, gave the highest net return per acre. All treatments in 1964 were understocked and for the 1965 trial stocking rates were increased.

Both trials were carried out with the assistance of the Manager and staff of the Pardelup Prison Farm, whose cooperation is gratefully acknowledged.

On the lightly stocked plots a large proportion of the clover burrs appeared to remain suspended in the mulch of dry pasture.

### Table 2.—Pasture composition, December, 1965

<table>
<thead>
<tr>
<th>Pasture Species</th>
<th>Stocking Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Mt. Barker sub. clover</td>
<td>48</td>
</tr>
<tr>
<td>Wimmera ryegrass</td>
<td>13</td>
</tr>
<tr>
<td>Volunteer grasses (mainly silver, barley and spear grasses)</td>
<td>35</td>
</tr>
<tr>
<td>Other species</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### Table 1.—Total pasture available

<table>
<thead>
<tr>
<th>Sampling Time</th>
<th>Stocking Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>lb./acre</td>
</tr>
<tr>
<td>Early January</td>
<td>3,568</td>
</tr>
<tr>
<td>End of March</td>
<td>1,026</td>
</tr>
<tr>
<td>Mid-August</td>
<td>1,423</td>
</tr>
<tr>
<td>Mid-December</td>
<td>3,891</td>
</tr>
</tbody>
</table>
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grass. The mulch would also have reduced the temperature fluctuations which cause "softening" of hard seed on the ground, so reducing clover germination. Clover content of the pasture was further reduced by obstruction and shading of newly-germinated clover seedlings.

The cattle showed a preference for Wimmera ryegrass seed heads and left the awny volunteer grass heads untouched.

Cattle

Liveweight changes

The cattle gained little liveweight on dry pasture; almost all the gain was recorded between April and December. Table 3 summarises the liveweight changes.

<table>
<thead>
<tr>
<th>Stocking Rate</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial weight per head</td>
<td>lb.</td>
<td>lb.</td>
<td>lb.</td>
<td>lb.</td>
</tr>
<tr>
<td>Final weight per head</td>
<td>879</td>
<td>890</td>
<td>931</td>
<td>897</td>
</tr>
<tr>
<td>Net gain per head</td>
<td>416</td>
<td>417</td>
<td>468</td>
<td>434</td>
</tr>
<tr>
<td>Net gain per acre</td>
<td>378</td>
<td>277</td>
<td>246</td>
<td>300</td>
</tr>
</tbody>
</table>

Dressed weights

At the end of the year all beasts were sold to Thomas Borthwick & Sons, Albany meatworks, where the carcasses were weighed and graded according to the Australian Meat Board export beef standards.

<table>
<thead>
<tr>
<th>Stocking rate</th>
<th>Live weight</th>
<th>Dressed weight</th>
<th>Per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>879</td>
<td>480</td>
<td>54.6</td>
</tr>
<tr>
<td>Medium</td>
<td>880</td>
<td>467</td>
<td>53.1</td>
</tr>
<tr>
<td>Low</td>
<td>931</td>
<td>501</td>
<td>53.8</td>
</tr>
<tr>
<td>Average</td>
<td>897</td>
<td>483</td>
<td>53.8</td>
</tr>
</tbody>
</table>

Chilled carcass weight sold per acre was:

- High stocking rate: 436 lb.
- Medium stocking rate: 311 lb.
- Low stocking rate: 264 lb.

Carcass quality

Only two animals, one from each of the of the high and medium stocking treatments, were slightly too lean to qualify for the top export quality grading. For local market they were graded as 1st and 2nd grade respectively.

Costs and returns

At the time of sale (December, 1965), the ruling prices for top quality yearling beef at Albany were:

- Up to 500 lb. carcass weight—20c per lb.
- 501 lb. and over—18.3c per lb.

This meant that the heavier animals fetched a lower price per pound of dressed weight.

The prices received for the experimental cattle were:

- High stocking rate—19.4c per lb. chilled dressed weight.
- Medium stocking rate—19.2c per lb. chilled dressed weight.
- Low stocking rate—18.6c per lb. chilled dressed weight.

Based on these prices, the net profit per acre was:

- High stocking rate—$28.82 per acre.
- Medium stocking rate—$15.64 per acre.
- Low stocking rate—$12.89 per acre.

Discussion

The 1965 trial was conducted in a far better season than normal, with early opening rains and a long growing season. The stocking rates were higher than in the previous year's trial, yet in all treatments there was more dry feed left over at the end of the growing season.

The liveweight gains reflected the excellent season: The 1965 trial animals gained an average of 113 lb. per head (32 per cent.) more than the 1964 trial animals.
Pasture utilisation was still wasteful. Under set-stocking at these stocking rates it was estimated that 25 to 50 per cent. of the spring flush of feed could go to waste. The pastures were always understocked in the spring, leading to undesirable changes such as the development of dominance of volunteer grasses and decline in the sub. clover content.

Young animals (8 to 12 months) made poor liveweight gains on dry feed during the summer. Almost all gains were made during the green pasture period.

Carcass quality

The highest carcass quality was achieved at the lowest stocking rate but by far the highest liveweight gains and carcass weights per acre were made by animals at the highest stocking rate. The result was that the highest net return per acre was achieved by the highest stocking rate of one yearling per 1.1 acres.

The Pardelup stocking rate trial was again repeated in 1966, with stocking rates increased still further so that overstocking occurred at the highest stocking rate. The 1966 results will be given in a future issue of the Journal of Agriculture.
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