Good pasture on a problem soil

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Cover Page Footnote
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Good Pasture on a

The acid peaty sands of the South-West have always been problem soils, and are often considered useless. But, by following recommended establishment methods, farmers like Mr. F. E. Bellanger, of Nornalup, have shown that it can carry valuable pasture.

*Left: Mr. Bellanger shows the depth and density of pasture produced.

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In recent years several farmers have established good pastures on soils related to the Plantagenet peaty sand series. This has been achieved with initial lime dressings of one ton an acre and liberal application of superphosphate, copper and zinc on a well prepared seedbed.

Mr. F. E. Bellanger pioneered this work at Nornalup, following the experimental results obtained at Denmark Research Station and in 1956 established 18 acres of pasture on Plantagenet peaty sand. An excellent pasture resulted in the first year and a highly productive stand has been maintained since then.

Plantagenet peaty sand is a podsolic soil of restricted drainage particularly in winter, and is one of the series occurring on the south coast between Cape Leeuwin and Albany. It is a strongly acid soil, with pH values often as low as 4.0.

The profile of Plantagenet peaty sand has been described by Hosking and Burvill as follows:

<table>
<thead>
<tr>
<th>Horizon</th>
<th>1 in.</th>
<th>Peaty Sand</th>
<th>2 in.</th>
<th>A₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grey-black to grey</td>
<td>17 in.</td>
<td>Sand with organic matter</td>
<td>A₂</td>
<td></td>
</tr>
<tr>
<td>Light grey to white with brown staining</td>
<td>51 in.</td>
<td>Sand</td>
<td>A₃</td>
<td></td>
</tr>
<tr>
<td>Dark brown</td>
<td>66 in.</td>
<td>Sand-soft coffee rock</td>
<td>B₁</td>
<td></td>
</tr>
<tr>
<td>White with brown staining</td>
<td>84 in.</td>
<td>Gritty Sand</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td>Cemented layer</td>
<td>B₂</td>
<td></td>
</tr>
</tbody>
</table>


The depth of A₃ horizon can vary and is related to drainage and severity and frequency of bushfires.

The native vegetation on Plantagenet peaty sand series is characterised by bottlebrush, tea-tree, kangaroo grass, and small rushes. Stunted trees may also occur in varying numbers; these are jarrah, blackbutt, swamp banksia and paperbark.

In some areas these soils remain moist at the surface in summer; in others the surface dries out.

Soils retaining moisture near the surface for the best part of summer are more successful for establishment of productive perennial pasture species. Mr. Bellanger's successful pasture establishment and management on such soil is of great interest.

Treatment and Production in 1960

A paddock consisting of 18 acres of fifth year pasture and six acres of second year pasture was stocked until the second week in March. It was then topdressed with 1½ bags of cobalt superphosphate and 1 cwt. of muriate of potash per acre. Strip grazing of the area by a herd of 22 cows started on May 15 and continued for 15 weeks, allowing a half-acre strip each day.
Problem
Soil

Right: Native vegetation—scrub, rushes, and stunted trees

With very little supplementary feeding the average production of the herd per cow per day was:

May: 1.5 lb. butterfat.
June: 1.8 lb. butterfat.
July: 1.6 lb. butterfat.
August: 1.7 lb. butterfat.

This paddock was closed at the end of August, and cut for silage and hay in October. It then yielded 40 tons of silage and 15 tons of excellent quality hay. During December it was again lightly grazed for two weeks by the same herd.

Establishment and Management up to 1960

The paddock was originally sown in the autumn of 1956 with a seed mixture of:

Yarloop Subterranean clover 10 lb. per acre.
Mt. Barker Subterranean clover 10 lb. per acre.
N.Z. Perennial Rye Grass 4½ lb. per acre.
Paspalum dilatatum 4 lb. per acre.

... and small quantities of Red clover, N.Z. White clover and Lotus major.

This was sown into a well prepared, moist seedbed.

Before planting, lime sand (containing 50 per cent. calcium carbonate) was applied at the rate of two tons an acre and incorporated into the soil by disc-cultivation to a depth of four inches.

After several harrowings, the above seed mixture, with all legume seed inoculated, was broadcast with copper-zinc superphosphate at the rate of two bags an acre.

This was followed by another harrowing.

A good pasture stand resulted, and was grazed in the first year. This excellent pasture has been under heavy rationed grazing since, except for six acres cut for silage and hay in 1959.

Annual fertiliser treatment has consisted of autumn top-dressing with superphosphate at two bags an acre.

Potassium deficiency became evident in the fourth year and the amount in one bag an acre of super-potash maintenance mixture was not sufficient to rectify it. Muriate of potash was applied at 1 cwt. per acre in 1960, and gave good results.

Bulrushes appeared in the second year and were eradicated by digging up the individual plants.

Under those conditions Yarloop subterranean clover, New Zealand White clover, and perennial ryegrass have performed well, and have given good production. The other sown species have either died out, or play only a minor part in the pasture production.

ACKNOWLEDGMENTS

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REFERENCES

Hosking and Burvill (1938).—C.S.I.R.O. Bulletin No. 115.
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