Effect of superphosphate on relative production from Trifolium subterraneum and T. balansae pasture at Cranbrook, Western Australia

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A trial was established in 1986 at Cranbrook (W.A.) to compare the responses of sub-clover and balansa clover to superphosphate. Rainfall averaged 500mm p.a. Soil test data included P 14ppm (Colwell), pH 5.2 (1:5 soil: water) and Reactive Iron 640ppm (Tamm's reagent). 200 kg/ha of superphosphate was recommended.

Methods

Sub-clover was sown on 12 Jure at 50kg/ha (cvs Dalkeith, Seaton Park and Junee) and balansa clover at 30kg/ha. Superphosphate was topdressed at 0, 150 and 300 kg/ha. The trial was rotationally grazed with one third always enclosed awaiting measurement, and the rest being grazed by paddock sheep. Pasture was measured at the beginning and the end of each enclosure period with capacitance meters calibrated against cuts from each pasture species. Samples of clover were collected for analysis in September, October and November.

Results and discussion

Winter growth was very slow owing to the late start and unusually low temperatures. Production responses are shown in Table 1.

Table 1. Response of (-lovers to superphosphate (t/ha dry matter).

Treatment	kg/ha	-15/9	-5/11	Total	Response
Sub-clover	Nil	1.0	2.6	3.6	-
	150 Superphosphate	1.1	3.8	4.9	1.3
	300 Superphosphate	1.2	4.4	5.6	2.0
Balansa clover	Nil	1.3	3.0	4.3	-
	150 Superphosphate	2.4	5.9	8.3	4.0
	300 Superphosphate	3.0	7.5	10.5	6.2

Prior to 1957 T. balansae was recorded (1) as being cultivated at Denmark (South Coast of WA) and was showing some promise. In South Australia it was reported (2) that: "Balansa produces less dry matter than Trikkala sub-clover during the winter but as much as or more than Trikkala during the spring." T. balansae swards near Esperance were noted (3) as growing rapidly in winter and producing double the dry matter of sub-clover after severe cutting.

The Cranbrook trial showed that without topdressing there was little difference in production between sub-clover and balansa. The response of sub-clover to superphosphate was good, and expected (+56%), whereas the response of balansa was astounding (+144%). For the same investment in superphosphate balansa gave three times the return in pasture dry matter of equal quality. Two points emerge:

- To know the potential value of a new species (or variety), comparisons must be made under conditions of high soil fertility.
- Fertiliser recommendations based on standard response curves for sub-clover do not necessarily provide adequate phosphorus for optimum production of other species.

1. Gardner, C.A. (1957) Bull. No 2424, W.A. Dept Agric.

2. Beale, P., Craig, A., and Crawford, E. (1985). Fact Sheet 6/85, S.A. Dept Agric.

3. Bolland, M.D.A. (1984) Farmnote 82/84, W.A. Dept Agric.