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EFFECT OF SUPERPHOSPHATE ON THE GERMINATION OF TOWNSVILLE LUCERNE (STYLOSANTHES HUMILIS H.B.K.)

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SUMMARY

In laboratory tests, superphosphate at the equivalent rate of 2½ cwt/ac inhibited germination of abraded seed.

The place of Townsville lucerne as a valuable pasture legume in parts of northern Queensland has been established for some years. This plant has the capacity to thrive moderately well on relatively poor soils but growth is improved in these conditions by the use of superphosphate.

A report on poor establishment of Townsville lucerne sown with superphosphate in a grazing trial conducted at "Swan's Lagoon" Cattle Field Research Station on the Burdekin in 1965 raised the question whether the seed may have been damaged by contact with superphosphate. In this grazing trial the seed was broadcast at the rate of 4 lb/ac with 1 cwt of superphosphate per acre. The stand of plants obtained was about half that obtained when the seed was sown at the same rate without superphosphate. It did not appear as if delayed germination due to impermeable seed coats was involved and it was decided to carry out a series of germination tests in the Standards Branch seed testing laboratory in order to gain information on Townsville lucerne seed germination in the presence of various amounts of superphosphate.

Two series of tests were completed, using two different seed lots. Varying rates of superphosphate were applied to lots of 25 seeds in 6-in. diam. petri dishes. Normal paper substrate was used and tests were carried out in cabinet germinators set at 32°C constant temperature. The seed pods were cut before being placed on the plates, each of which was moistened with 25 ml of water to which the

required amount of superphosphate had been added. Cutting is standard testing practice and involves removal of a large portion of the base of the seed pod, including part of the caryopsis. This enables the germination count to be completed in about 3 days.

Results are set out in Table 1.

TABLE 1

RESULTS OF GERMINATION TESTS

Superphosphate per Plate (g)	Equivalent Superphosphate Rate (cwt/ac)	Germination (%)				Mean Germination (%)
Nil	Nil	92	84	92	92	90
0·1	0·5	68	80	80	84	78
0·2	1·0	80	68	80	72	75
0·3	1·5	72	68	48	52	60
0·4	2·0	40	28	40	60	40
Nil	Nil	98	100	98	98	98
0·1	0·5	84	84	92	100	90
0·5	2·5	..	..	..	..	..
1·0	5·0	..	..	..	..	..
5·0	25·0	..	..	..	..	..

Superphosphate at all tested rates of application affected the germination of abraded Townsville lucerne seed. Germination declined significantly above a superphosphate rate equivalent to 1 cwt/ac and was completely inhibited by rates above 2 cwt/ac.

It could be assumed that any type of germinating seed would be damaged by close proximity to free superphosphate, and that laboratory testing of seed would be more likely to demonstrate this than field testing. However, while the laboratory tests may have been very limited in providing evidence on seed reaction under field conditions, there is an indication that field germination of Townsville lucerne may be inhibited in the presence of broadcast superphosphate above a dressing rate of 1 cwt/ac.