PASTURE ESTABLISHMENT ON PUMICE SOILS

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The talk delivered at the Grassland Conference was a summary of the following paper, which has recently been published in the New Zealand Journal of Science and Technology :

Pasture Establishment on Pumice Soils, by P. D. Sears, E. 0. C. Hyde, and R. M. Greenwood. N.Z. Journ. SC. & Tech., Sec. A, Vol. 37, No. 2, Aug., 1955.

For full details of the experiments this Journal should be consulted. Summary of the results are given below :

1. Field surveys showed that a very large proportion of clovers sown on pumice soil under development in the Rotorua-Taupo area failed to survive, particularly white and subterranean clovers. The normal course of such pasture development is to go slowly through phases of red clover and white clover dominance and then into a mixed grass-white clover pasture. An endeavour was therefore made to eliminate these early seedling losses and to speed up the whole pasture cycle.

2. The experimental programme followed a plan of (a) better placement of seed and fertiliser, and (b) inoculation of clover seed.

3. A very much improved strike of clovers and a great improvement in the efficient use of phosphatic fertilisers was obtained with seed and fertiliser placement in bands about $\frac{3}{4}$in. in depth on a well-consolidated seed bed. A roller-drill was especially developed for this purpose. Commercial roller-drills are now being manufactured in New Zealand and Australia.

4. If no roller-drill is available, improvement in seed strike and fertiliser effectiveness can be obtained by using the normal Cambridge roller and seed boxes, etc., to effect a placement of seed and fertiliser in the indentations made by the roller rings.

5. It was found that insufficient effective clover bacteria were present in this virgin pumice to ensure adequate nodulation of clover seedlings. Inoculation of the seed with effective strains of *Rhizobia* eliminated the early check to clover growth.

6. Of the methods of inoculation tried, those found successful and suitable for application to mixed seed on a large scale were (i) mixing the seed with the inoculum grown on finely divided peat or pumice, and (ii) treating the seed with inoculum suspended in milk at such a rate that, after vigorous mixing, all the free liquid was absorbed by the seed within a few minutes.

7. Using the above practices better and more uniform emergence of seedlings was obtained, with better survival and growth of the clover seedlings, particularly of white and' subterranean clovers. As a result it was possible to reduce both the rate of seeding and of the initial phosphate application and still obtain better seedling establishment and balance of clovers as compared with normal broadcast methods.