

A comparison of lime and sewage ash to correct soil acidity

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Soil acidity is a major problem on the Southern Tablelands of New South Wales, reducing pasture establishment and production (1,2). Liming to correct the problem is expensive, and there is a need for cheaper alternatives. Sewage ash, which is produced by incinerating sewage sludge precipitated with lime and other materials, is such as alternative. It is highly alkaline, contains about 2% P as well as Mg, Fe, and other minerals, and presents a disposal problem in Canberra. We have therefore conducted field and glasshouse experiments to compare the effectiveness of lime and sewage ash on pasture production and clover P status, on a problem acid soil.

Methods

In a field experiment, lime and sewage ash at 0, 1, 2, and 4 t/ha were incorporated into an acid soil some two months before sowing with a clover-grass pasture. Soil pH at sowing, clover tissue P and herbage yields were measured. In a glasshouse experiment, the same treatments were mixed through soil from the field experiment site and placed in pots with basal N, G, S, Mo, B, Zn and Cu. Seven days later inoculated seed of Woogenellup subterranean clover was sown; each pot was thinned to 10 plants at the cotyledon stage. Tissue P content was determined on leaf samples taken prior to harvesting, after which soil from each pot was analysed for pH, exchangeable Al and Ca, and extractable P (Bray No 1).

Results and discussion

Results are presented in Table 1.

Table 1. Effect of lime and sewage ash on soil and plant factors.

TREATMENT	FIELD EXPERIMENT			POT EXPERIMENT					
	pH 1:5 H ₂ O	Tissue P %	D.M. yield t/ha	pH 1:5 CaCl ₂	Al % CEC	Ca % CEC	Soil P ppm (Bray No. 1)	Tissue P %	DM Yield g/pot
NIL	4.7	0.17	4.25	4.2	24.5	55.8	6.8	0.17	1.46
Lime 1t/ha	4.9	0.16	4.76	4.5	8.1	75.9	7.7	0.16	1.69
2 "	5.2	0.22	5.24	4.9	1.6	85.6	8.0	0.17	2.07
4 "	5.4	0.21	5.97	5.7	0.6	90.9	9.0	0.20	2.23
S. Ash 1t/ha	5.0	0.23	4.91	4.5	8.2	74.4	11.6	0.20	2.06
2 "	5.1	0.22	5.43	4.9	2.0	83.2	14.9	0.23	2.38
4 "	5.7	0.23	6.22	5.6	0.4	88.3	20.6	0.25	2.52
LSD 5%	0.1	N/A	1.03	0.5	1.5	5.5	0.9	0.22	0.54

Sewage ash was shown to be as effective as lime in raising pH and decreasing Al. It also increased soil available P and clover tissue P. Both lime and sewage ash increased pasture yield in the field and clover yield in pots, the ash being somewhat more effective.

Our results indicate that sewage ash is a suitable alternative to lime for increasing the production of acid soils. Using sewage ash for this purpose would also be worthwhile way of disposing of a waste product.

1. Williams, C.H., 1980. Aust. J. Exp. Ag. An. Husb. 20 : 561-567.

Bromfield, S.M., Cumming, R.W., David, D.J., Williams, C.H. 1983. Aust. J. Exp. Ag. An. Husb. 23 : 181-191.

