The Influence of SLASH and Fly Ash on Plant Production and Soil Chemical Properties of Acidic and Infertile Soils

Wayne F. Truter [1], Norman F.G. Rethman [1], Richard A. Kruger [2] and Kelley A. Reynolds [3]

[1] Department of Plant Production and Soil Science, University of Pretoria, Pretoria, 0002, South Africa
[2] Ash Resources Pty (Ltd), P.O.Box 3017, Randburg, 2125, South Africa
[3] Eskom TSI, Private Bag 40175, Cleveland, 2022, South Africa

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ABSTRACT

Prime agricultural land is a limited resource in South Africa. It is, therefore, necessary to reclaim poor and disturbed soils to feed the burgeoning population. Using conventional methods is costly and not necessarily sustainable. The challenge is to use alternative materials in an economically, ecologically and socially acceptable manner. Previous research has shown that sewage sludge can be pasteurized by mixing it with class F fly ash and a suitable source of quicklime. The **SL**udge**ASH** (SLASH) mixture has been extensively evaluated as a soil ameliorant and has proven to be viable for the reclamation of poor and marginal soils. Many pot and raised bed studies focusing on the effect of SLASH on plant production of various plant species have been conducted and reported on previously.

This paper reports on subsequent research conducted to determine the effect of both fly ash and SLASH on the production of maize *(Zea Mays)*, wheat *(Triticum aestivum)* and alfalfa (*Medicago sativa*). The effect of treatments on soil chemical properties was also monitored in this study. SLASH and fly ash treatments were compared with agricultural lime and an untreated control. The results obtained illustrate improvements in crop yields, wheat yields on SLASH and fly ash treatments were 270% and 150% better than the control respectively, while yields of maize and alfalfa were improved by 130 and 450% respectively. Soil chemical properties were also improved by the SLASH and fly ash treatments. The results presented are encouraging and justify further research on the use of fly ash and it's co-utilization with other by-products to restore productivity to poor agricultural lands.