

# **EFFECTS OF INTEGRATED USE OF CALLIANDRA CALOTHYRSUS AND MAIZE STOVER WITH UREA ON SOIL MINERAL NITROGEN, STRIGA INFESTATION AND MAIZE YIELDS IN WESTERN KENYA**

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## **ABSTRACT**

This study investigated the effects of applying different combinations of two contrasting plant residues, *Calliandra calothyrsus* (*Calliandra*) and maize stover, with urea on *Striga* infestation and maize yield in western Kenya. A randomized complete block design (RCBD) with 12 treatments replicated four times was used. The following plant residue: urea combinations were used so as to supply a total of 75 kg ha<sup>-1</sup> in each treatment combination; 75:0, 60:15, 45:30, 30:45, 15:60, and 0:75 for five seasons (2007-2009). A control treatment where no nutrient inputs were applied was included. *Calliandra* applied at 45 kg N ha<sup>-1</sup> plus urea (30 kg N ha<sup>-1</sup>) and maize stover applied 15 kg N ha<sup>-1</sup> plus urea (60 kg N ha<sup>-1</sup>) had consistently lower *Striga* infestation compared to other treatments. Negative linear relationships between maize yield and *Striga* population were observed in the first three seasons i.e. 2007 LR, 2007 SR and 2008 LR. Overall mean maize grain yields over the five seasons were highest (3.0 t ha<sup>-1</sup>) under maize stover (30 kg N ha<sup>-1</sup>) combined with urea (45 kg N ha<sup>-1</sup>) followed by *Calliandra* (45 kg N ha<sup>-1</sup>) combined with urea (30 kg N ha<sup>-1</sup>) with (2.7 t ha<sup>-1</sup>). Maize stover (30 kg N ha<sup>-1</sup>) in combination with urea (45 kg N ha<sup>-1</sup>) increased maize grain yields relative to the control by 275%, 107% and 155% in the first, second and third seasons respectively. Treatments with *Calliandra* (45 kg N ha<sup>-1</sup>) in combination with urea (30 kg N ha<sup>-1</sup>) increased maize grain yields relative to the control by 191%, and 233% in the first and third seasons respectively. The control and sole maize stover (75 kg N ha<sup>-1</sup>) had the lowest yields across all the seasons. The optimum application rate for stover was 30 kg N ha<sup>-1</sup> nitrogen equivalent while that for *Calliandra* was 45 kg N ha<sup>-1</sup>.