

The effect of using inorganic and cattle manure with different top-dressing rates of ammonium nitrate on yield of maize under wetland conditions

World Journal of Agricultural Sciences Vol. 1(1), pp. 018-025, February 2013

Claid Mujaju, Godwin Mtetwa, Zacharia Muchingami, Francis T. Mugabe and Adelaide Munodawafa

Abstract

Smallholder farmers are facing problems of low soil fertility causing maize yield reduction of up to 1.5 tonnes per hectare (t/ha) compared to 5 t/ha obtained in the commercial sector. A maize trial was conducted on two wetlands in Natural Region IV of Zimbabwe at Zungwi vlei to determine effects of different rates of compound D and cattle manure as basal dressing with different rates of ammonium nitrate as top-dressing. The maize used was a two-way early maturing hybrid developed by Seed Co. (SC513) for marginal areas. Four basal applications were applied in the trial as treatments for two seasons with four different levels of nitrogen applied as subplots factor. The analysis revealed a highest significant increase in grain yield when 300 kilogrammes per hectare (kg/ha) of compound D was applied with 150 kg/ha of ammonium nitrate (N) as top-dressing. Significant increase in grain yield was also observed when cattle manure was applied with 150 kg/ha top-dressing of N. There was a significant yield advantage when the nitrogen was increased after applying a basal dressing in both sites for the two seasons. In order to achieve high yields, the use of compound D at 300 kg/ha as basal dressing and top-dressing at 150 kg/ha N is highly recommended to farmers. However, for the lowresourced and poor farmers, the use of cattle manure which is generally cheaper and affordable is recommended.