

# Effect of Nitrogen Source, Soil Type and Depth of Application on Ammonia Volatilization

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## INTRODUCTION

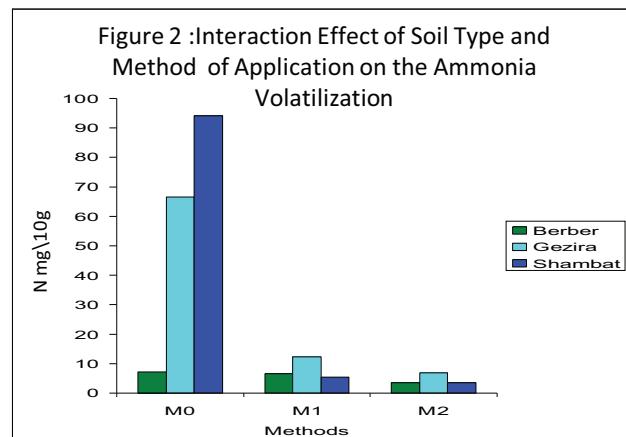
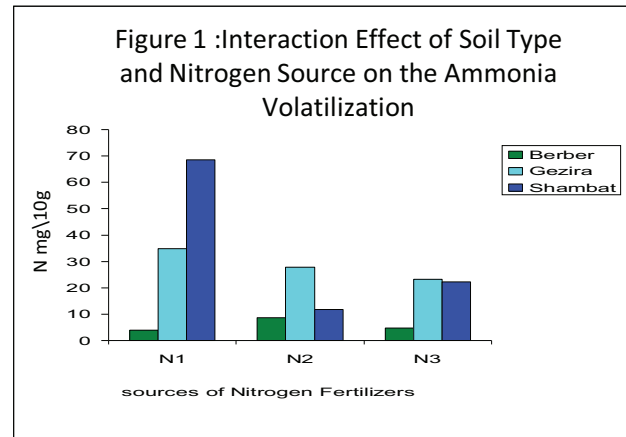
This study is focusing on the possibility of utilizing aqueous ammonia that obtained as a by-product from Khartoum Petroleum Refinery in agriculture as a nitrogenous fertilizer. It is fortunate that Sudan petroleum is sweet crude devoid of heavy metals that are detrimental to human and animal health (according to analysis carried out in Canada by Talisman Petroleum Company in 2002). A greater understanding of effect of sources of nitrogen fertilizers on the rate of ammonia volatilization under such conditions is very important to obtain optimal yield for agricultural crops. The objective of this research is to investigate the amount of ammonia volatilization from applied aqueous ammonia as compared with other sources of nitrogen fertilizers in the three sites under investigation.

## MATERIALS AND METHODS

Laboratory and field experiments were conducted to study the effect of soil type and methods of fertilizer application on the ammonia volatilization when three orders of Sudan soils (Aridisols, Vertisols and Entisols) were fertilized by three types of nitrogenous fertilisers; namely, (Aqueous ammonia, Urea and Ammonium sulphate) in Berber, Gezira and Shambat, respectively. These fertilizers were applied by three methods: superficial application with irrigation water and injection in depth of 5 cm and 15 cm.

## RESULTS AND DISCUSSIONS

The results obtained from Berber (Aridisols) were recorded lower values of ammonia volatilization than Gezira (Vertisols) and Shambat (Entisols) soils (Fig. 1). This can be attributed to the high content of sand in Berber which increase permeability and consequently raise ammonia loss by infiltration. The higher loss was recorded from the first method of application on all soil types (Fig. 2). This can be attributed to the surface addition that probably indicate more available nitrogen for the volatilization compared with second and third methods of application and this is in line with Sigunga et al, (2002). However the higher values of ammonia loss in Vertisols and Entisols were obtained from aqueous ammonia. These results agree with the finding of El-Karim *et al.*, (2004), however the high salinity may negatively affected the microbial growth and decrease urea hydrolysis to ammonium carbonates which may decrease the overall process of volatilization.



## CONCLUSION

To reduce ammonia loss by volatilization it is recommended to use injection in depth of 5 cm and 15 cm for all types of fertilizers and locations.

## References

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