

NITROGENOUS FERTILIZER LOSSES AND SUBSTITUTES ON TOBACCO SOILS

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Yields of tobacco in Sri Lanka have been poor, compared to most countries in spite of using high yielding varieties. These studies were undertaken because losses of nitrogenous fertilizer due to denitrification and volatilization were suspected.

An incubation experiment was conducted to study the rate of nitrification in tobacco soils collected from Mudugoda, Hanguranketha, Kudawewa and Galewela. In addition, field experiments were conducted to determine:

- (1) The extent to which nitrogen gets lost from the soil under field conditions and
- (2) The methods by which these losses could be reduced.

Results indicate that nitrification takes place in all samples studied. The rate of nitrification is irregular during the incubation period. However, after nearly seven weeks almost all ammonium nitrogen applied is converted to nitrate nitrogen.

There is a considerable amount of leaching losses from these fertilizers although the relative efficiency of the three fertilizers was almost the same. Split applications of fertilizers had no significant effects on plant height, weight, yields or the content of nitrogen in leaves, shoots and roots.

Comparison of natural organic manure and a synthetic organic fertilizer (I.B.D.U.) indicate that the latter controlled leaching losses considerably. Plant height and weight, together with their total nitrogen contents were increased by this fertilizer. Thus it is better than ammonium sulphate as a source of nitrogen for tobacco. Use of green manure or farmyard manure too indicates that leaching of nitrogenous fertilizer was considerably controlled.

In a separate experiment it was found that volatilization losses were negligible. Leaching following nitrification of added fertilizer is the main cause of fertilizer losses. Green manure and cattle manure were better than ammonium sulphate recommended in the Ceylon Tobacco Company fertilizer mixture.