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**NITROGEN USE EFFICIENCY AND GROWTH
PERFORMANCE OF OKRA (*Abelmoschus esculentus* (L.) Moench)
IN SANDY REGOSOL AMENDED WITH LOCALLY
AVAILABLE ORGANIC MANURES AND UREA
INTEGRATIONS**

BY

DONA HARSHANI SHANIKA WICKRAMASINGHE



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ABSTRACT

In modern agriculture over use of inorganic fertilizers causes dangerous effects on environment, human health and loss of soil fertility especially in sandy regosols, where the poor soil structure promotes heavy leaching of nutrients. A pot experiment was carried out at Eastern University, Sri Lanka during the period of 10th of March to 15th of July 2014, to evaluate the nitrogen use efficiency and growth performance of okra (*Abelmoschus esculentus* (L.) Moench) in sandy regosol using variety EUOK - 2. There were thirteen treatments replicated four times in Completely Randomized Design. They include poultry manure, farmyard manure, *Leucaena leucocephala* green leaves and paddy straw as organic nitrogen sources and urea as the inorganic nitrogen source. The organic nitrogen sources were evaluated solely and in combination with urea at the rate of 50% and 100% from each in weight basis. These all treatments were tested with control with no organic nitrogen or inorganic nitrogen sources and were evaluated among themselves also. Among sole organic manure applications, poultry manure and *Leucaena* green leaves significantly performed better than other sole applications in regard to soil available nitrogen content at the time of planting, pod yield, nitrogen uptake, total plant dry matter and leaf area. But in case of residual soil nitrogen (RSN), nitrogen use efficiency expressed as agronomic efficiency (NUE-AE) and physiological efficiency (NUE-PE), paddy straw, farm yard manure and *Leucaena* green leaves significantly performed better than other sole organic manures respectively. Among 50% organic nitrogen sources integrated with 50% urea, higher performance was registered in poultry manure in regard to pod yield, nitrogen uptake, total plant dry matter and leaf area where farmyard manure recorded remarkable performance in NUE-AE and NUE-PE. In

case of RSN, paddy straw registered the highest. Among 100% organic manure combined with 100% urea, poultry manure registered the higher available nitrogen content at the time of planting, nitrogen uptake, total plant dry matter and leaf area and followed by *Leucaena* green leaves and yield performed vice versa. Farmyard manure and *Leucaena* green leaves performed better in case of NUE-AE and NUE-PE and paddy straw recorded significantly higher RSN. Ultimately, among the thirteen treatments, it was concluded that significantly highest nitrogen uptake and yield were obtained in application of sole poultry manure. On the other hand, highest RSN was registered in 100% paddy straw with 100% urea and significantly highest soil available nitrogen at the time of planting, total plant dry matter and leaf area were recorded in 100% poultry manure integrated with 100% urea. Higher NUE-AE and NUE-PE were registered in application of sole farmyard manure and *Leucaena* leaves respectively. So sole poultry manure, farmyard manure and *Leucaena* leaves can be suggested to the farmers especially for the cultivation of okra on sandy regosol in order to obtain the best yield and growth performance and indirectly reduce use of chemical fertilizers.

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