

# Accumulation of dry matter and nitrogen in the shoots of maize (*Zea mays* L.) and nitrogen leaching as affected by organic and chemical nitrogen fertilizers in Guilan province

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**ABSTRACT:**

The experiment was carried out during 2014 cropping season as split plot arrangement in a randomized complete block design with three replications of *Zea mays* in agricultural and natural resources research center of Guilan Province, Rasht, Iran. Three maize varieties including 703, 704 and 705 (as main plot) and rates of nitrogen supplementation including  $N_1$ = zero (as check),  $N_2$ = 100 kg/ha,  $N_3$ =200 kg/ha,  $N_4$  =300 kg/ha and  $N_5$ = 8500 kg/ha,  $N_6$ = 17000 kg/ha and  $N_7$ = 25500 kg/ha as vermicompost (as sub plot) comprised the experimental factors. In this experiment, the interaction effects between maize varieties and nitrogen rates showed significant differences for wet and dry weight of leaf and stem, nitrogen content of leaf, stem and corn hear. The results showed that the interaction effects between 705 variety  $\times$  300 kg N/ha had the greatest stem dry weight and nitrogen content. But, the greatest leaf dry weight of 704 variety obtained as affected by 25500 kg vermicompost per hectare. In this research, application of 25500 kg vermicompost per hactar caused to increase nitrogen content of leaf in 703 variety, compared to other studied treatments. Basis on the results of this experiment, the interaction effects between 703 variety  $\times$  100 kg N/ha, had the greatest nitrogen content of maize hear. Generally, the results showed that leaching of nitrogen increased due to enhance of nitrogen fertilizer utility per unit area. The rate of nitrogen leaching at 100, 200 and 300 kg N/ha treatments was 24, 44.95 and 47.03 percent, respectively. But, the mortality of nitrogen due to use of vermicompost fertilizer was less than chemical nitrogen fertilizer.

**Keywords:**

Food security, Nitrate Leaching , Accumulation of Nitrate, Maize, Nitrogen Fertilizer.