

Giang Hong Dinh 2014: Plant Densities and Nitrogen Fertilizer Rates
Affect on Growth, Nitrogen Use Efficiency and Grain Yield of Different
Maize Hybrids under Rainfed Condition of Southern Vietnam.
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Maize (*Zea mays* L.) is the one of the major food crops grown in Vietnam. The plant density (PD) and nitrogen (N) fertilizer are considered the most important crop management practices in improving maize grain yield. Two identical field experiments at Ba Ria and Dong Nai, were conducted in the wet season 2011 to study the effects of plant density and N rate on different maize hybrids. A split-split plot in RCB design was used and replicated three times. Two maize hybrids, NK7328 and LVN10, constituted the main plots and three PD (57,000, 71,000 and 84,000 plants ha⁻¹) were sub plots. Five N rates (0, 60, 120, 180 and 240 kg N ha⁻¹) were sub sub plots. The results revealed that NK7328 had greater LAI at Ba Ria and Dong Nai than LVN10. It also had greater grain yield than LVN10 at both locations (8.16 vs 7.19 and 8.09 vs 6.76 tons ha⁻¹, respectively). This greater grain yield was attributed to greater kernel number ear⁻¹ and kernel weight. Considering nitrogen use efficiency (NUE), NK7328 exhibited higher NUE than LVN10. Increased PD from 57,000 to 84,000 plants ha⁻¹ and N rate from 0 to 180 kg N ha⁻¹ increased anthesis-silking interval (ASI) and leaf area index (LAI). Grain yield, number of kernel ear⁻¹ and 1,000-kernel weight decreased with the increase in PD and vice versa with N rate. NUE of maize hybrid was significantly affected by N fertilizer rate but PD did not. The highest NUE was not associated with the greatest maize grain yield. The optimum plant density and N rate were 71,000 plants ha⁻¹ or 70 × 20 cm spacing and 120-180 kg N ha⁻¹ to be applied for maize production under rainfed condition in the southern Vietnam.

Student's signature

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