

Examination of the Water and Nutrient Utilization of Maize Hybrids on Chernozem Soil

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Abstract : The research was set up on chernozem soil at the Látókép AGTC MÉK research area of the University of Debrecen in Hungary. We examined the yield, the yield production per 1kg NPK fertilizer and the water and nutrient utilization of hybrid PR37N01 and PR37M81 in 2013. We found that PR37N01 produced the most yield at the level of N120+P (17,476kg ha⁻¹) while PR37M81 reached the highest yield at level N150+PK (16,754kg ha⁻¹). Studies related to yield production per 1kg NPK indicated that the best results were achieved at level N30+PK compared to the control treatment. Yield production per 1kg NPK was 17.6kg kg⁻¹ by P37N01 and 44.2kg kg⁻¹ by PR37M81. By comparing the water utilization of hybrids we found that the worst water utilization results were reached in the control treatment (PR37N01: 26.2kg mm⁻¹, PR37M81: 19.5kg mm⁻¹). The best water utilization values were produced at level N120+PK in the case of hybrid PR37N01 (32.1kg mm⁻¹) and at N150+PK in the case of hybrid PR37M81 (30.8kg mm⁻¹). We established the values of the nutrient reaction and the fertilizer optimum of hybrids. We discovered a strong relationship between the amount of fertilizer applied and the yield produced ($r^2=0.8228-0.9515$). The best nutrient response was induced by hybrid PR37N01, while the weakest results were reached by hybrid PR37M81.

Keywords : hybrid, maize, nutrient, yield, water utilization

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