Responce of maize (zea mays,l.) to nitrogen and manganese fertilization

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Two field experiments were conducted at the agriculture research and experimental station of the faculty of agriculture at moshtohor, zagazig university in the two successive growing seasons of 1997 and 1998. the aim was to study the effects of four nitrogen levels (0, 50, 100 and 150 kg n /fed), three manganese nutrient rates (tap water, 70 and 140 mg mn /1) and three methods of mn application (grain soaking, folar spraying and soaking + spraying) on the growth , grain yield and its components as well as grain quality of maize cv. t.w.c.310, the soil of the experimental plots was clay texture, with a ph value of 7.91,3.89 % caco3, 1.98 % organic matter content, 17.3 mg /kg available n and 8.5 mg /kg available mn, a spilt-plot in a randomized complete block design with four replications was used, the main plots were devoted for nitrogen levels, the sub-plot for mn levels and their methods of application. sub-plot area was 16.8 m2 (1/250 fed). planting was done on 22 june in 1997 and 1998. the preceding crop was wheat in both seasons, the results of the experiments could be summarized as follows : i-effect of nitrogen application : 1-the increases in nitrogen rates significantly decreased number of days to 50 % tasseling and silking in both seasons. the earliest flowering was reached at the highest nitrogen level.2-application of 50, 100 and 150 kg n / fed significantly increased plant height, ear height, stem diameter, number of active green leaves / plant and area of the topmost ear leaf at 75 days from planting. the highest value of these traits were generally recorded at the highest n rate, 3-application of nitrogen fertilizer levels caused significant increases in leaf area index (lai), dry weight / plant, crop growth rate (cgr), relative growth rate (rgr) and net assimilation rate (nar), 4-grain yield components, namely, number of ears / plant, ear length, number of kernels / row, number of rows / ear, ear diameter, 100- kernels weight, ear weight, grain yield / ear, shelling % and grain yield /plant significantly increased with increasing n. rates up to 150 kg /fed. however, the difference between 100 and 150 kg n /fed in some studied characters were not significant, 5-grain, straw and biological yields /fed as well as crop index and harvest index significantly increased with increasing nitrogen rates up to 150 kg n fed, application of 50, 100 and 150 kg n /fed significantly increased grain yield over the control treatment by 178.7, 374.5 and 432.4 % in the 1997 season and 171.2, 310.1 and 364.3 % in the 1998 season, being 174.4, 337.3 and 393.1 % in the combined average, 6-application of nitrogen fertilizer levels caused a significant increase in p, k, cp, mn and oil percentage in maize grain, while, it decreased total carbohydrate content in both seasons.