

Flowering in relation to yield, yield components and fiber properties of four promising Egyptian cotton genotypes.

Abstract

Four Egyptian promising cotton genotypes (*G. barbadense* L.) i.e. (L 97 derived from cross Giza 90 x Aust.), (Giza 90), (L 95 derived from cross [(G.83 x (G.75 x 5844)] x G.80) and (Giza 80) were tested for their fruiting habit, aiming to evaluate their earliness, yield, its component characters and fiber properties during 2013 and 2014 seasons. The study showed that flowering started slowly and then increased gradually, reached the peak in the fifth week (4 to 10 July) after 111 days from planting in all studied genotypes. The line 97 produced higher number of flowers /plant compared to other tested genotypes. The number of flowers / plant significantly different among genotypes. The periods, in which each genotype produced 50 % of the total flowers/plant, existed after 31, 32, 33 and 34 days from the initiation of flowering in the four genotypes, respectively. The number of open bolls/plant showed the same trend of flowering in the tested genotypes. The best flowering weeks which produced high number of boll retentions and consequently open bolls/plant was in the fifth week (4 to 10 July) for all studied genotypes. The first 50 % of flowers produced 67 %, 64 %, 62 % and 59 % of the number of open bolls/plant, determining the yield /plant in the four genotypes, respectively. The obtained mean values of boll weight were not significant, while significant differences were found among the genotypes in seed cotton yield/plant. The genotype line 97 produced better seed cotton yield/plant compared to the other genotypes. The line 97 had the highest lint percentage followed by that of Giza 90. Line 97 showed the longest values for in staple length and strength. The obtained results clarify that L 97 was the earliest compared to the other genotypes. The fifth week showed the best values in the studied characters except micronaire reading.

A 2-year field experiment (2013 and 2014) was conducted in calcareous soil (CaCO₃ 19.2%), on soybean grown under three irrigation regimes 100%, 85% and 70% of crop evapotranspiration combined with three potassium (K₂O) levels (90, 120 and 150 kg ha⁻¹). The objective was to investigate the complementary properties of potassium fertilizer in improving soybean physiological response under water deficit. Plant water status (relative water content RWC, chlorophyll fluorescence F_v/F_0 and F_v/F_m), had been significantly affected by irrigation or/and potassium application. Potassium improved growth characteristics (i.e. shoot length, number, leaf area and dry weight of leaves) as well as physiochemical attributes (total soluble sugars, free proline and contents of N, P, K, Ca and Na). Yield and yield water use efficiency (Y-WUE) were significantly affected by irrigation and potassium treatments. Results indicated that potassium application of 150 and 120 kg ha⁻¹ significantly increased seed yield by 29.6% and 13.89%, respectively, compared with 90 kg ha⁻¹ as average for two seasons. It was concluded that application of higher levels of potassium fertilizer in arid environment improves plant water status as well as growth and yield of soybean under water stress.