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## SUMMARY

Two field experiments were conducted during 2006 and 2007 summer growing seasons at Ismailia Agricultural Research Station farm, Egypt, to study the effect irrigation intervals i.e. 3, 5 and 7 day intervals and gypsum rates i.e. 0, 500 and 1000 kg/feddan on growth characters, yield, yield components, and some chemical components of seed as well as seasonal water consumptive use and water use efficiency on two peanut genotypes Gregory and Giza 6 under sprinkler irrigation in the sandy soils conditions.

A split- split design with four replications was used, the main plots were devoted to irrigation intervals (A), the sub plots were assigned to gypsum rates (B) and the sub- sub plots were represented by the two genotypes (C). the experiment consisted of 18 treatments. The analysis of variance was used for this investigation according to **Snedecor and Cochran (1981)**, the least significant difference (L.S.D) test at 5% level of significant was used to indicate treatment differences.

## **A - GROWTH CHARACTERS**

The results of the growth characters get across that, plant height (cm) and number of primary and secondary branches/plant were increased significantly with increasing irrigations. In general the lowest values for the above studied characters attributed to the irrigation every 7 day.

Gypsum application, results revealed that gypsum applied 500 or 1000 kg/feddan increased both number of primary and secondary branches/plant were significant effect while plant height increased significant when gypsum was not applied.

With regard to, the relation between the examined genotypes and the growth attributes under study, Gregory genotype pronounced its superiority in number of primary and secondary branches/plant while Giza 6 surpassed in plant height in both seasons.

The first order interactions had significant impact on those growth characters in both seasons, for example irrigation every 5 day with 500 or 1000 kg gypsum /feddan gave the highest averages for number of primary branches and number of secondary branches. While irrigation every 3 day without gypsum application gave the highest values in plant height.

Results revealed that Giza 6 cultivar under irrigation every 3 day gave the highest values in plant height while irrigation every 5 day with Gregory genotype gave the highest values in number of primary and secondary branches/plant in both seasons.

### **B - Yield and yield components**

The obtained results showed that irrigation every 5 days gave the highest values of pods yield/plant, seeds yield/plant, shelling percentage, pod and seed yields/fed., while irrigation every 7 day gave the highest values of number of pods per 100 gm and number of seeds per 100 gm.

Application of 500 or 1000 kg gypsum/fed., tended to produce higher pods yield/plant, seed yield/plant, pod and seed yields/fed., however, applying 1000 kg gypsum /fed., produced higher shelling percentage. while gave the highest values in number of pods per 100 gm when was no applied.

The results indicated that cultivation of Gregory genotype surpassed Giza 6 in pods yield/plant, seed yield/plant, pod and seed yields/fed., while Giza 6 surpassed in number of pods and seeds per 100 gm in both seasons.

The interaction effect between irrigation treatments and gypsum application 500 or 1000 kg/fed., on pod and seed

yield/fed., were significant, whereas, it was in the 1<sup>st</sup> season on pod yield/plant.

The results showed that cultivation of Gregory genotype with irrigation every 5 day increased in pod yield/plant, seed yield/plant, pod and seed yield/fed., in two seasons. While Giza 6 cultivar with irrigation every 7 days surpassed in number of seeds per 100 gm in two seasons.

On the other hand, interaction between 3 variable showed that (irrigation intervals x gypsum rates x genotypes) were insignificant in all characters except shelling percentage in 1<sup>st</sup> season only.

### **C -CHEMICAL ANALYSIS**

Regarding to peanut quality parameters (oil and protein%) in the seed, the results showed that both of them were significant by affected with irrigation intervals. irrigation every 7 day gave the highest seed oil percentage as compared to irrigation every 3 days that achieved the highest seed protein percentage.

Application gypsum by the rate of 1000 kg/fed., gave the highest values in seed oil %, while the highest seed protein percentage was obtained when gypsum was no added.

Results of the seed chemical analysis revealed that, the highest protein percentage attributed to Gregory genotype in

2<sup>nd</sup> season, whereas seed oil percentage significantly differed the same genotypes in the first season only.

#### **D- WATER RELATION**

The obtained results showed that irrigation peanut plants every 3 days gave higher water consumptive use than irrigation at 5 or 7 day. While delaying irrigation to 5 or 7 days gave the highest value of water use efficiency.

Application of 500 or 1000 kg gypsum/fed., tended to produce the highest water use efficiency.

The results indicated the superiority of Gregory genotype on Giza 6 cultivar in water use efficiency as well as water consumptive use in both seasons.

The results showed that irrigation peanut plants every 5 day with adding 500 or 1000 kg gypsum/fed., gave the best values of water use efficiency as well as superiority Gregory genotype with irrigated every 5 day to produce the highest of water use efficiency. While Gregory genotype surpassed with irrigation every 3 days and gave the highest water consumptive use in two seasons.