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Introduction.

Grain legumes have been a constant presence in agriculture around the world since about 10,000 years. These species with average crude protein ranging between 17% and 30% are products with high interest, thus emerging as the preferred crop diversification of cultural systems. Chickpea (*Cicer arietinum* L.) is the third most important grain legume worldwide. Despite being a traditional spring crop it suffers decreased production when subjected to long periods of drought during reproductive development. Climatic variations in the Mediterranean impose new guidelines in breeding programs of chickpea (Maçãs, I, 2003). Elvas is in a region (Alentejo - Portugal) with marked Mediterranean influence. The average temperature of the warmest month of the year is above 20°C and the coldest reaches 5°C, but rarely below 0°C. The average annual temperature is around 15°C (not exceeding 20°C). Rainfall is irregular among years. In general, rainfall is concentrated in the cool season and is expected to decrease in spring/summer. It is also projected that regions with higher rainfall will tend to become increasingly dry, due to increased evaporation. The analysis by sectors of water use in the Mediterranean region shows that 72% of available water is used in agriculture (Hamdy and Lacirignola, 1999) and is becoming a rare resource, especially in southern countries (Margat and Vallee, 1997). According to Shideed et al. (2005) farmers spend large amounts of water, exceeding the needs of crops (in winter or spring crops). Their crops are irrigated between 30-49% above the needs (Hamdy and Katerji, 2006). Thus it is important to choose plants tolerant to drought, since it is known that this tolerance varies from species to species and also within species (Jallel et al., 2008).

Conclusions

- Genotypes that fasten their development cycle showed higher grain yield. Earlier start of flowering means higher soil water availability and lower maximum temperatures (middle of April), allowing to set more flowers and pods per plant and consequently higher grain yield.
- End of flowering started on May 19 in earlier genotypes. On this date the most hydrated genotypes are the ones with the longest growth cycle. On May 19 the genotypes with higher grain yield were at the end of flowering and showed lower predawn water potential.
- Grain yield showed a good correlation with all yield components except with the 100 Seeds Weight (100SW).