

PACHECO, C.A.; DIAS, A.C.; NETO, F. & DIAS, P.S.S.1

## **SUGAR BEET FIELD CROP IRRIGATION IN PORTUGAL**

The sugar beet culture in Portugal covers 10000 ha.yr<sup>-1</sup> and is located on the Vale Tejo, Alto and Baixo Alentejo. In these regions, rain extends from October to May, solar radiation is saturated from May to September and thermic stress appears during June, July and August, which limited sugar beet growth. The soil's potential productivity is low or medium. Center pivot's is the main irrigation system.

Answering the classic question of when, how and how many irrigated, results gathered in the experimental fields from 2000 to 2005 allow us to conclude that:

1. Irrigation most begin with the seedling and finish when the crop is gathered;
2. The irrigation schedule of the field crops can occur in two conditions: maximum hydric confort and moderated hydric deficit. In the first condition, the productivity increases strongly and the polarisation drops significantly. In the second condition, the yield of normalised sugar beet (13%) could represent a greater income to the farmer;
3. In the maturation phase, the water requirements in maximum hydric confort of the field crop, range from 7 to 8 mm/day and photosynthetic rate is about 25-30  $\mu\text{mol.m}^{-2}\text{s}^{-1}$ . In moderated hydric deficit condition, the need for water ranges from 5 to 6 mm/day and the photosynthetic rate is about 15-20  $\mu\text{mol.m}^{-2}\text{s}^{-1}$ ;
4. The total field sugar beet water requirements, estimated by hydrologic equation, range from 1000 to 1200 mm.ha<sup>-1</sup>.yr<sup>-1</sup> for the best situation and drop to 800-1000 mm.ha<sup>-1</sup>.yr<sup>-1</sup> in moderated hydric deficit condition;
5. Sugar beet is moderately tolerant to drought up to 20-30 % of the available soil water (AW). The photosynthetic rate drops linearly when AW decrease from 70-80 % to 20-30%. Thermic stress during the June to August months is similar to the hydric stress;
6. The normalised sugar beet yields, with no tillage (direct drilled) and minimum tillage are in most cases, higher or equivalent to classic tillage. The maximum experimental yield reached ranges from 90 to 100 t.ha<sup>-1</sup>.

Other languages: not available

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<sup>1</sup> Instituto Superior de Agronomia – Departamento de Ciências do Ambiente. Tapada da Ajuda; 1399 Lisboa  
**Tel/Fax:** (+351) 213646982; **Email:** capacheco@isa.utl.pt