

## Researches on the Behaviour of Pepper Genotypes (*Capsicum annuum L.*) at the Thermic and Hydric Stress

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**Abstract.** For assessing the behaviour of the pepper genotypes to the abiotic factors, 21 genotypes of pepper were studied, organized in 3 technological variants: V1- culture irrigated by irrigation standards assuring optimal conditions for the plants' growing and development; V2- culture for which small irrigation standards are administered, in critical moments; V3- non-irrigated culture, as of bedding the culture. In the conditions of technological variant V3, only plants of the variety long pepper Cosmin survived, but fruit size was reduced the production being situated well below, comparing with other two versions.

**Keywords:** pepper, genotypes, irrigation, abiotic, hydric stress

**Introduction.** Within the context of the current weather changes and the orientation towards on sustainable and ecological agriculture, the cultivars must show tolerance to environmental adverse factors (abiotic and biotic factors), and to require an relatively low anthropic input. The need for assuring the water in the soil and atmosphere for growing the vegetable plants is imposed by their very high content of water. The water quantity consumed by the vegetable plants during the vegetation period is determined first of all by the level of the perspiration coefficient, by the perspiration productivity, by the water balance and by the consumed water utilization coefficient (Voican et al., 1994). The lack of water from the soil manifests itself by temporary or long-term withering, with negative repercussions on the plants' growing and productivity (Ceaușescu et al., 1984). The lack of water from the soil disturbs the flower differentiation process and pollen formation, while affecting the flower fecundation process, with repercussions on the plants' growing and fruiting process. In the absence of water the fruits remain small and deformed, they do not reach the characteristic form for their type, while the production significantly decreases (Somos, 1984; Pintilie, 1998; Sbîrciog, 2003). The atmospheric drought affects the viability of the pollen small grains and especially their germination on the stigma.

**Aims and objectives.** The evaluation of local germplasm fund in terms of behavior towards biotic and abiotic factors, in different climatic conditions and crop systems is a priority in the strategy of mitigation climate changes.

**Materials and methods.** For achieving this goal, as part of ADER 1.1.10 project, twenty-one genotypes of pepper (varieties, advanced homozygous lines and accessions from SVGB) were studied in 2012, at RDIVFG Vidra.

The experiment was organized in three technological variants : V1- irrigated as per normal growth and development needs, V2-50% of standard irrigation, V3- not irrigated. Water administration to the plants was made by dripping. For testing the genotypes as to the thermic and hydric stress the following observations and determinations were made: occurrence of flowers, occurrence of first fruits, number of fruits/plant, fruit weight. The results obtained represent average values and the interpretation of the differences' significance was made following the multiple comparison method (Duncan).

**Results and Discussion.** In Vidra area, the year 2012 was characterized by extremely high temperatures, in the months of July, August and even September, with maximum temperatures above 30<sup>0</sup>C, starting with May. These were correlated with extremely poor precipitations, in the period of June – September, much below the multiannual values. The big quantity of precipitations recorded in May (174.5 l/sq.m.), exceeded by far the multi-annual average of this month which is of 81 l/sq.m. In the same period the temperatures suddenly decreased, being by 8-10<sup>0</sup>C lower than the multi-annual average of this month. In June the precipitations were of only 21.5 l/sq.m, distributed in the first part of the month, while in July there were no precipitations. With regard to temperature, it recorded higher and higher values, from one month to another. In June there were maximum values of more than 34<sup>0</sup>C, and in July of more than 35-38<sup>0</sup>C at umber and more than 55<sup>0</sup>C at soil. The precipitations from May caused, including for variant V3 (non-irrigated), the catching percentage at transplantation to be of 100% as well as the normal carry-out of the first phenophases. The small precipitations from June-July, doubled by excessively high temperatures, enhanced the drought effect, triggering a significant decrease in the production of variants V2 and V3. The analyses of the recorder production revealed, V1- the variant with optimal technology, had the highest production. Yields recorded in the second experimental version (V2- reduced water usage, only in critical moments) accoded between 40%-50% of production recorded on the first version. In case of VT3- the variant without water after planting, only plants of the variety long pepper Cosmin survived, but fruit size was reduced the production being situated well below, comparing with other two versions.

### **Conclusion**

The plants' growth and development was influenced by: the environment conditions and technological variant; the yielding capacity in V2 variant, for both sowing periods, was more than 50% lower for all genotypes, at variant VT3 the plants did not survive until the end of growing season.

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