

Evaluation of Day-Time Heating at the Yair Research Station

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Abstract

This experiment was conducted in the context of a four-season experiment at the Yair Research Station that evaluated the effects of day-time heating and night-time heating on pepper (*Capsicum annuum*) yield and quality. In all of the experiments conducted at the Yair Research Station, no advantage was associated with day-time heating, and intense day-time heating (approx. 35°C) caused a significant decrease in yield. In contrast, at the Zohar Research Station, heating was found to have a positive effect. (Spanish trellising was used at the Zohar Research Station.) Our assumption for this year's experiment was that crop yield would be limited by the amount of foliage on the plant, based on an inverse relationship between fruit-setting capacity and the amount of foliage on the plant, following the use of Dutch trellising to limit the amount of foliage. This experiment was conducted using Spanish trellising, in which there is almost no pruning.

The experiment was conducted at the Yair Research Station, Arava, in four greenhouses that each had an area of 340 m². In each greenhouse, we transplanted (4 Sept. 2007) pepper plants of the cultivars Celica and 7158, with four replicates of each cultivar. Two of the four greenhouses were heated to a minimum night-time temperature of 12°C. During the day, an average temperature of 28°C was maintained in these greenhouses. The third greenhouse was not heated at night, but the day-time temperature in this greenhouse was kept at 28°C. The fourth greenhouse served as a control. This greenhouse was not heated and its sides were not closed. The temperature in the fourth greenhouse was determined by the prevailing environmental conditions.

Day-time and night-time heating treatments (minimum 12°C) did not contribute to the production of high-quality yield in either of the cultivars, in comparison to day-time heating alone. The yield quality of cv. 7158 was not affected by any of the treatments and (for this cultivar) there was no difference between the results of the heated treatments and those of the control. However, an effect on overall yield was observed and day-time and night-time heating had positive yield effects. For cv. Celica, there were no differences between the yields of the heated treatments, but the control treatment yielded significantly less (in terms of overall yield and export-quality yield) than the heated treatments. This significant difference can be attributed to an unusually cold January. The results of this experiment suggest that there are highly significant differences between the responses of different cultivars to heating treatments, and additional cultivars should be evaluated in this context.