Effects of Different Shade Treatments on Quality and Yield of Lisianthus

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Abstract

Lisianthus production in Israel is primarily directed to the winter and spring, which is when European lisianthus production is reduced and prices are high. For this reason, there is an interest in transplanting young plants as early in the season as possible (until October), while air temperatures are still high. This causes a significant delay in the development of the plants and delayed flowering, which is problematic. In order to facilitate the establishment of the transplanted plants and decrease the temperature around the crop, growers shade production plots from the time that the plants are transplanted. The shading material is left in place for different periods of time, the durations of which have been determined empirically. To date, there have been no in-depth investigations into the effects of shading on quality and yield of lisianthus in the Arava. The primary goals of this investigation were: (1) to test the effects of shade treatments on the development of lisianthus plants, particularly on the timing of differentiation for flowering, the timing of flowering and flower quality; and (2) to set up a system to chart the biochemical factors that contribute to flowering in lisianthus. The study was conducted at the Yair Research Station in the Arava during the 2004/5, 2005/6, 2006/7 and 2007/8 growing seasons. In the first year of the research, we saw that heavy shading negatively affected both the quality and quantity of flowering branches in the cultivar 'Echo White'. In this season, the shading was in place for long periods of time; the plants spent 58 days under a 75% shade net. In the second season, we shortened the periods of time that the plants were shaded, and found that the best treatments were those in which the plants spent five weeks under a 50% shade net or three weeks under a 75% shade net. In this season, the tested cultivar was 'Mariachi White'. The actual shading treatments ranged from 67 to 88%. In the third year, we examined a combination of different shading treatments and transplanting dates. None of the shading periods exceeded five weeks. In terms of transplanting dates, for two cultivars, the development of plants transplanted on September 28 was generally one week faster than that of plants transplanted on October 16. Shading delayed differentiation to flowering in all of the cultivars. The amount of amylin was noticeably reduced in all of the plants, indicating that lisianthus plants are dependent on the constant supply of assimilates from the process of photosynthesis.

In the fourth year, we transplanted plants without any shade and, only after differentiation, spread 90% shade nets, which were left in place for three weeks. From the results of the fourth year's experiment, we learned that shading after differentiation also has a negative effect on the amount of flowering branches available for harvest, as well as the timing of the harvest of the first crop wave.