

The effect of temperature on growth and dry matter production of avocado plants

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Abstract

Grafted cv. Fuerte and cv. Hass avocado plants were grown for 81 days in sunlit growth chambers at day/night temperatures of 17/10, 21/14, 25/18, 29/22, 33/26 and 37/30°C. Stem diameter, length of side branches, the number of leaves, leaf area and plant height, were all greater in the 21/14 to 33/26°C temperature range, than at temperatures of 17/10°C and especially 37/30°C, which restricted growth in both cultivars. Total dry matter accumulation by Fuerte was greatest at 25/18°C, while Hass was less affected by temperature extremes. High temperatures produced maximum dry matter in the leaves, while low temperatures produced it in the roots. Temperatures of 37/30°C reduced root growth and dry matter accumulation by 60-70% as compared with the optimal treatments. It is suggested that under high temperature conditions measures should be taken to cool the soil. The Fuerte plants were more affected by temperature extremes than were the Hass plants which had a broader range of optimal growth response. Therefore cv. Hass could be expected to adapt better to extreme temperature conditions. Hass plants grown under high temperatures exhibited a greater leaf diffusive resistance than Fuerte and are therefore more capable of reducing water loss from the leaves. As temperatures decreased, more red pigment was evident in the young flush of both cultivars.