

Growth and physiological responses of tomato plants cv. Río Grande during may to july season. Effect of shading

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Abstract

Tomato production of Río Grande cultivar has much agricultural potential in Zulia State. However, in this region there is not harvesting during the may to july months. Plants were grown under two light environments: full sunlight and shade, to establish as possible causes, the effect of light stress, and the consequent high and constant temperature stress. A completely randomized design was used. Leaf area and biomass were measured. Biomass distribution parameters, net photosynthesis, stomatal conductance, leaf and air temperature and photon flux density were determined. Plant height and leaf area increased in the shade. Total biomass decreased under full sunlight. Roots, stems and leaves contributed to this effect. Specific leaf area (SLA) increased in the shade, indicating thinner leaves. Also leaf weight ratio (LWR) increased by shading, reflecting a higher total biomass porportion forming the leaf surface. Leaf area duration (LAD) was higher under the shade, and while relative growth rate (RGR) increased in this condition at all growth intervals, net assimilation rate (NAR) only increased after the second interval, showing an effect on the intermediate and late growth stages. The higher photosynthesis and conductance observed under sun corresponded with a higher transpiration. In conclusion, due to the higher and constant temperature, there was a reduction in vegetative growth, and fruit establishment was not produced. Therefore, these months are inadequate to grow tomato cv Río Grande. Shading contributed to ameliorate the effect on vegetative growth, probably by causing a decrease in temperature, but did not alter fruit establishment.

Key words: tomato, biomass distribution, temperature, irradiance, growth.

Recibido el 17-11-1999 • Aceptado el 13-06-2000

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