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Effects of Relative Light Intensity on the Growth, Yield and Curcumin Content of Turmeric (*Curcuma longa* L.) in Okinawa, Japan

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Abstract: The effects of relative light intensity (RLI) on the growth, yield and curcumin content of turmeric (*Curcuma longa* L.) were examined in Okinawa, Japan. The plants were shaded with white nets with different mesh sizes for maintaining respective RLI. Five RLI, 100 (without shading), 82, 79, 73 and 59% in 2004-2005 and four RLI, 100, 68, 52 and 48% in 2005-2006 were evaluated. In the first experiment, plant height increased markedly, but the number of leaves and tillers, and SPAD value increased slightly in the plants grown at 59-82% RLI compared with control (without shading). Turmeric shoot biomass and yield increased significantly at 59-82% RLI and they were highest at 73% RLI in the first experiment. Curcumin content of turmeric increased markedly at 59-73% RLI as compared with the control in the first experiment. Similar results in plant growth, shoot biomass, yield and curcumin content were obtained in the second experiment, but the effects of RLIs were smaller than in the first experiment because of late planting. This study indicates that turmeric is a partial shade-tolerant plant that could be cultivated at around 59-73% RLI for higher yield and curcumin content in Okinawa. However, the degree of RLI required for better turmeric cultivation may vary with the place, year and irradiance level.

Keywords: Curcumin, Irradiance effect, Medicinal plant, Root crop, Turmeric yield

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