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12

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Photosynthesis and Growth Response of Domesticated Cuphea to Temperature.

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Cuphea (*Cuphea viscosissima* Jacq. x *C. lanceolata* W.T. Aiton; PSR23) is a new oilseed crop being developed as a domestic source of small and medium chain triglycerides. Field studies show that PSR23 cuphea grows well in the northern Corn Belt, but little is known about its growth response to temperature. An environment-controlled study was conducted to determine cuphea's response to temperature and gain a better understanding of its adaptability to certain climates. Plants were grown at 18/12, 24/18, 30/24, and 35/27°C day/night temperature regimes and photosynthesis and growth were measured. Leaf photosynthesis was greatest for plants grown at 24/18°C and WUE of CO₂ assimilation declined with increasing temperature. Leaf A/Ci response indicated that both Rubisco- and RuBP-limited photosynthetic rates acclimated to temperature. Although leaf area was greatest at 30/24°C, specific leaf weight declined with increased temperature. Total biomass and rate of biomass accumulation were greatest under the 24/18 and 30/24°C treatments. Cuphea appears to adapt to a relatively wide temperature range, but clearly prefers mild temperatures. PSR23 may not perform well agronomically under climates where mean daily temperatures exceed 27°C for extended periods.

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