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Effects of Drought and Shading on Non-structural Carbohydrate Stored in the Stem of Potato (*Solanum tuberosum* L.)

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Abstract: Most studies on non-structural carbohydrate (NSC) are concentrated on the leaf and tuber, and little is known about NSC in the stem and its function. To test the hypothesis that NSC stored in stem contributes to stable tuber bulking under stress conditions, we grew plants in pots in a greenhouse under drought and shading conditions for 17 d during tuber bulking. Compared with the control, drought and shading significantly reduced leaf and stem dry weights (DW) and total NSC concentration in the main stem base. However, tuber DW increased by 77% in drought and by 46% in shading conditions relative to the control. The contributions of NSC loss in the stem to tuber DW increase in drought and shading conditions were 37% and 54%, respectively. This study suggests that NSC stored in the stem base is supplied to tuber under stress conditions to support tuber bulking.

Keywords: Drought, Non-structural carbohydrate (NSC), Potato, Shading, Stem base

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