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Effects of Carbon Dioxide Enrichment during Different Growth Periods on Flowering, Pod Set and Seed Yield in Soybean

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Abstract: The objective of this study is to elucidate the effects of CO₂ enrichment during different growth periods on flowering, pod set and seed yield in soybean (*Glycine max* (L.) Merr.). Soybean cultivar 'Fukuyutaka' was grown in a growth chamber of the Institute of Bioresources Research Center of Kyushu Electric Power Co., Inc. at Saga, Japan (33°17'-N, 130°18'-E) under natural light. The CO₂ concentrations were maintained at 350 μmol mol⁻¹ for ambient CO₂ and at 700 μmol mol⁻¹ for CO₂ enrichment. CO₂ concentration was elevated during the whole growth period (WP), vegetative growth period (VP) or reproductive period (RP). Seed yield was increased by CO₂ enrichment during RP or WP due to the increase of pod number, but not by CO₂ enrichment during VP. Although CO₂ enrichment had no effect on the number of flowers, CO₂ enrichment during RP increased the pod number on all raceme orders and that during WP increased the pod number in the secondary and tertiary racemes. It is suggested that an increase of seed yield by CO₂ enrichment is mostly brought by the improvement of pod set, mainly on the high-order racemes that opened later during flowering period, and that the response of seed yield to CO₂ enrichment is mainly attributed to the response during RP.

Keywords: [CO₂ enrichment](#), [Growth stage](#), [Flowering](#), [Pod set](#), [Raceme order](#), [Soybean](#)



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