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## Plant Nitrogen Levels and Photosynthesis in the Supernodulating Soybean (*Glycine max* L. Merr.) Cultivar ‘Sakukei 4’

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**Abstract:** Supernodulating soybeans, having several times more nodules than normal genotypes, are expected to produce higher dry matter and grain yields through a higher nitrogen fixation potential. However, their growth and yield have been inferior to those of normal genotypes. We have recently developed the supernodulating genotype ‘Sakukei 4’ (formerly ‘En-b0-1-2’, presently ‘Kanto 100’), with improved growth and yield and a high nitrogen fixation potential. The objective of the present study was to examine the time course of changes in plant nitrogen content, leaf chlorophyll content (SPAD value), and photosynthetic rate of Sakukei 4 to reveal the source of its advantages in growth. The leaf nitrogen content after the flowering stage and the stem nitrogen content after the seed-filling stage were higher in Sakukei 4 than in the normal cultivar ‘Enrei’. The SPAD values in Enrei and another normal cultivar, ‘Tamahomare’, decreased rapidly after the seed-filling stage, whereas that in Sakukei 4 stayed high until the late seed-filling stage. Differences in photosynthetic rate and leaf SPAD value between Sakukei 4 and Enrei were negligible at the beginning of podding but became very clear at the seed-filling stage because of the drop in the values for Enrei. In Sakukei 4, a large amount of nitrogen might not be translocated from leaf to seed during the seed-filling stage because of the higher capability of the nodules to send fixed nitrogen to the growing seeds. Sakukei 4 could thus maintain a high photosynthetic rate and grain growth during the seed-filling stage.

**Keywords:** [Chlorophyll content](#), [Glycine max L. Merr.](#), [Nitrogen content](#), [Nitrogen](#)



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