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## The Occurrence of Delayed Stem Senescence in Relation to *trans*-Zeatin Riboside Level in the Xylem Exudate in Soybeans Grown under Excess-Wet and Drought Soil Conditions

[Junko Sato](#)<sup>1)</sup>, [Tatsuhiko Shiraiwa](#)<sup>1)</sup>, [Makoto Sakashita](#)<sup>1)</sup>, [Yasuhiro Tsujimoto](#)<sup>1)</sup> and [Ryuji Yoshida](#)<sup>2)</sup>

1) Graduate School of Agriculture, Kyoto University

2) College of Technology, Toyama Prefectural University

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**Abstract:** Delayed stem senescence (DSS) after pod maturation in soybean (*Glycine max*) lowers the quality of products in the mechanized harvest. The effects of drought and excess wet soil conditions on the occurrence of DSS were studied with special reference to remobilization of vegetative nitrogen and supply of cytokinin via xylem. Excess wet soil treatment was applied throughout the reproductive period to field-grown soybean in 2003 (Exp.1) and short-term drought stress treatment was applied during the reproductive period to pot-grown soybean plants in 2004 (Exp.2). The degree of DSS at pod maturing was evaluated by the DSS score from “1” for severe DSS to “5” for completely synchronous senescence of pods and vegetative parts. The DSS score in Exp.1 varied from 2.2 to 2.5 and that in Exp.2 from 2.8 to 3.7. Excess wet soil treatment in Exp.1 promoted the occurrence of DSS, while drought stress treatments during the periods of flowering to pod elongation, later seed-filling and seed maturing decreased it. The soybean plants that showed distinct DSS had lower ratios of seed number to vegetative dry weight at seed maturity and a lower rate of nitrogen remobilization from vegetative organs to seeds during the latter half of the reproductive period. The *trans*-zeatin riboside (*t*-ZR) level in xylem exudate tended to be higher in soybeans with severer DSS than in those normally matured in both experiments showing increased *t*-ZR concentration and/or higher exudation rate. These results suggest that DSS can be caused by a wet soil water condition, which lowers pod/seed number and increases vegetative organs mediated by the increased supply of cytokinin through xylem during seed-filling.

**Keywords:** [Cytokinin](#), [Delayed stem senescence](#), [Drought stress](#), [Sink and source](#), [Soil water content](#), [Soybean](#)

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