

## **Seed growth rate, seed filling period and yield responses of soybean (*Glycine max*) to plant densities at specific reproductive growth stages**

### **ABSTRACT**

There is limited information on the seed growth parameters to different plant densities and their effect on plant yield. The purpose of this study was to investigate the effect of plant population density on changes of rate and duration of seed growth at specific reproductive growth stages, and to examine relationships between seed growth rate (SGR), seed filling period (SFP) and yield components in soybean. In first experiment, three soybean varieties included; AGS 190 (vegetable type), Palmetto and Deing (grain types) were grown at 20, 30 and 40 plants m<sup>-2</sup>. In the second experiment, AGS190, and grain types of Argomolio and Willis were grown at 20, 30 or 50 plants m<sup>-2</sup>. Results indicated that differences in plant density did not affect the SGR or SFP during any reproductive growth stages. Dry matter accumulation rate in seed was highest during reproductive growth stages of R6-R7. This period of growth for seed development was highest in SGR and SFP. As plant density increased, seed number of individual plant decreased. Seed number adjustments and SGR patterns interpreted the stability of final seed size within variety, despite the changes of plant density. Seed growth rate and seed filling period correlated inversely with seed number per plant and positively with final seed size. In conclusion, number of plants per unit area and number of seeds per plant are important features to determine yield potential, not seed growth rate in soybean.

**Keyword:** Reproductive growth stages; Seed growth rate; Seed filling period; Plant density; Soybean