Partitioning of sucrose into protein, oil, and starch in soybean cotyledons cultured in planta and in vitro. (C02-westgate163112-Poster)

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Abstract:

The response of soybean protein and oil content to temperature during seed filling varies with genotype. We are testing whether this response is primarily a seed or plant-determined characteristic. Genotypes known to vary in seed composition (Evans, Proto and PI132.217) were grown at high (35/27C), moderate (27/20C), or low (20/12C) temperature during seed filling. Cotyledons from each treatment were grown in vitro at these temperatures for 12 days beginning 18 DAF. Oil % in planta was maximal at moderate temperature. Protein % in planta increased with temperature in Proto, but was fairly stable in Evans and the PI line. Growth in vitro varied with genotype and in planta temperature. Moderate temperature was optimum for protein accumulation. Low temperature in planta limited the capacity of cotyledons to accumulate oil in vitro. The lowest % protein was achieved by cotyledons grown both in planta and in vitro at high temperature. These results indicate that the response of oil and protein accumulation in soybeans is largely a seed-determined characteristic. They imply that metabolic conditions controlling final seed composition are established early in seed development.

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