Public Abstract
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Agronomy
Soybean Seed Components as Affected by Nodal Position, Environmental Conditions, And Irrigation
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Graduation Term: Winter 2005

Current soybean research is aimed toward not only improving nutritional quality of the seed, but also toward developing agronomic practices resulting in increased production efficiency. In the past, research has shown that the protein and oil contents of soybean seeds vary with respect to the position on the plant, which the seed developed. Protein content is higher in seeds that developed at the apex of the plant than it is in seeds from the basal part. The opposite distribution is seen in oil content. Additionally, the types of protein and fatty acid profile of the oil present depended upon whether the seed developed on nodes from the apex or basal part of the plant. Proteins containing a higher percentage of essential amino acids were found in seed from the basal nodes. Oil, which was higher in the polyunsaturated fatty acids, was more abundant in seed from the lower nodes. In a long-term study conducted at Sanborn Field, it was determined that environmental factors and agronomic practices affected nutritional quality of the soybean. Over the course of this trial protein content of the soybean increased significantly while that of the oil diminished. Irrigation is another agronomic practice utilized in some regions of Missouri soybean production. Although irrigation enhances yield, neither the protein nor oil content is improved under this practice. However, the isoflavone content of the soybean was dramatically increased in the irrigated crop. Investigation of the mechanisms underlying accumulation of seed components will provide information leading to development of plants, which produce seed of enhanced nutrient quality and quantity.