Role of the Cob in N Transfer into Developing Maize Kernels. (C02-seebauer155537-Poster)

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Abstract:

Despite an abundance of studies on maize (Zea mays L.) kernel physiology, there are few examining the subtending cob, even though all incoming assimilates must pass through the cob tissue. Therefore, our objective was to determine physiological and developmental changes in the cob and its role in the movement of N assimilates into maize ovules. Two maize hybrids were grown in 2001 at two N levels (0 and 168 kg N/ha) in combination with two pollination conditions (either pollinated or unpollinated). Cobs were sampled at 2, 8, 14, and 16 days after silking (DAS), and analyzed for amino acid composition and activities of enzymes involved in amino acid metabolism. With the exception of Gln, all of the amino acids accumulated over time in unpollinated cobs, especially when adequate N was supplied. In contrast, amino acids decreased during development in pollinated cobs. Gln concentration and glutamine synthetase activity decreased markedly throughout early cob development, regardless of pollination status or N supply; while aspartate aminotransferase activity remained relatively high. These data, and other aspects indicating an active role of the cob in the interconversion and transport of amino acids into developing kernel tissues will be discussed.

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