Effects of Intra-Row Spacing on Maize Growth in the Mid South. (C02-bruns085247-Oral)

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Abstract:

Maize (Zea mays L.) hybrids produced in the 1950's and 1960's responded to increased plant densities with more barren plants ha-1 and less grain per plant. Hybrids grown today produce high grain yields under high plant populations. Maize produced in the Mid South often uses a 101.6 cm row spacing, which is commonly used to produce cotton (Gossypium hirsutum L.). Six maize hybrids, two Bt and four normal, were grown using a 101.6 cm row spacing and plant densities of 43,000, 48,000, 54,300, 64,000 and 76,500 plants ha-1 in 2000 and 2001 at Stoneville, MS. Yields increased with increasing plant density with no yield plateau or decline observed at the highest population. Grain bulk densities varied among plant densities but no trend was evident. Kernel weights, ear weights, and leaf area plant-1 all declined with increasing plant density. However, declines in kernel and ear weights did not adversely affect grain yield. Ears ha-1 was the most important yield component in this experiment. Leaf area index increased with increasing plant density thus negating the decline in leaf area plant-1. Leaf area index was higher in 2000 than in 2001, probably due to more rainfall. Hybrids differed in LAI, yield, kernel bulk density and kernel weight but, these differences were not correlated to each other. Aflatoxin levels were below the maximum allowable level of 30 mg Mg-1 both years of the experiment. Fumonisin levels were higher in 2001(5.0-7.9 mg kg-1) than in 2000 (0.5-1.6 mg kg-1) due to a more favorable environment for its production. Maize can be grown in the Mid South using the currently available hybrids and a population of 76,500 plants ha-1 without a decline in yield or grain quality.

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