Reproductive Abnormalities in Glyphosate-Resistant Cotton Due to Lower CP4-EPSPS Levels in Male Reproductive Tissue. (C01-wilcut071940-Oral)

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Abstract:

Studies were conducted to characterize the effect of glyphosate treatments on the development of male and female reproductive organs of cotton flowers at anthesis. Glyphosate applied at both the four-leaf stage postemergence (POST) and at the eight-leaf stage POST directed inhibited the elongation of the staminal column and filament. The increased distance from the anthers to the stigma resulted in 42% less pollen deposited on stigmas of glyphosate-treated plants than in nontreated plants. Pollen development is likely inhibited or aborted at the vacuolate microspore and vacuolate microgamete stages of microgametogenesis. Stigmas from glyphosate-treated plants were 1.2 to 1.4 mm longer than those from nontreated plants. The presence of the GR 5-enolpyruvylshikimate-3-phophatesynthase enzyme from Agrobacterium sp. strain CP4 was quantified in reproductive and vegetative tissues using enzyme-linked immunosorbent assay. The content of CP4-EPSPS in the stigma, anther, preanthsis floral bud (square), and flower petals was significantly less than that in the vegetative leaf tissue.

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