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Cotton Response to Imazapic and Imazethapyr Applied to a Preceding Peanut Crop

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Knowledge of the potential for herbicide residues to persist and damage rotational crops is important when developing and recommending weed management strategies. Peanut (*Arachis hypogaea* L.) commonly is planted in rotation with cotton (*Gossypium hirsutum* L.) in North Carolina. The imidazolinone herbicides imazapic {(±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid} and imazethapyr {(±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid} are used commonly in peanut. Field experiments were conducted to determine the effects of imazapic and imazethapyr applied to peanut on the growth and yield of cotton planted the following year. Imazapic was more injurious to cotton when applied preplant incorporated to the preceding peanut crop, compared with postemergence application. Imazapic applied preplant incorporated at 35 g a.i. ha⁻¹, or half the manufacturer's recommended rate, did not injure cotton. Imazapic applied preplant incorporated at 70 and 140 g ha⁻¹ visibly injured cotton 19 to 58%, and imazapic at 140 g ha⁻¹ delayed cotton maturity and reduced yield 44%. Imazapic applied postemergence at 70 to 140 g ha⁻¹ caused minor injury to cotton but did not affect yield. No cotton injury was noted following imazapic applied postemergence at 35 or 53 g ha⁻¹. Imazethapyr applied postemergence to peanut at the recommended rate of 70 g a.i. ha⁻¹ did not injure cotton. Imazethapyr applied postemergence at 140 g ha⁻¹ caused visible injury to cotton but did not affect yield. No treatment affected cotton fiber quality.