

Tolerance of Traditional and Imidazolinone Resistant Canola to Soil Applied Residual Herbicides in the Southeastern United States

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Residual herbicides for weed control in southeastern U.S. row crops include chemistries that have carryover potential in canola. Traditional (c.v. 'Flint') and imi-resistant canola have potential as a winter crop in the southeast. However, rotational issues must first be addressed. Imi-resistant (Clearfield) canola may be more suited for southeastern production due to the prevalence of acetolactate synthase (ALS) inhibiting chemistries in rotation crops. The ALS herbicides imazapic, diclosulam, chlorimuron, pyriithiobac, and trifloxysulfuron are all commonly used for weed control in potential rotation crops, including peanut, cotton, and soybean. Additionally, the protoporphyrinogen oxidase (PPO) herbicides flumioxazin, fomesafen, and sulfentrazone are frequently used in these crops. Rotational restrictions for herbicide registrations are based on traditional canola, but not for imi-resistant cultivars. Hence, canola planted as a rotational crop following cotton, peanut, soybean, vegetables, or corn in the southeastern U.S. can result in crop stand failure due to injury from previously applied herbicides. Research was conducted to determine herbicide tolerance levels for traditional and imi-resistant canola cultivars to the previously stated ALS and PPO herbicides at 0.25X, 0.5X, and 1.0X application rates. Imi-resistant and traditional canola exhibited extensive injury and nearly complete stand failure and crop loss with the PPO herbicides flumioxazin, fomesafen, and sulfentrazone. For the ALS herbicides imazapic, chlorimuron, and pyriithiobac, imi-resistant canola injury was $\leq 17\%$ for all rates and yield were not different from the nontreated control. In contrast, Flint canola exhibited $\geq 88\%$ injury and significant yield reduction for imazapic, chlorimuron, pyriithiobac, diclosulam, and trifloxysulfuron at all rates. Imi-resistant canola exhibited dose response injury of 38, 56, and 80% for the 0.25X, 0.5X, and 1.0X rates of diclosulam, respectively. This indicates that imi-resistant canola is not resistant to all ALS herbicides and should be considered when planning potential rotational option for canola with peanut.