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Cotton Response to Temperature and Pyriithiobac

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Cotton (*Gossypium hirsutum* L.) normally has good tolerance to pyriithiobac {2-chloro-6-[(4,6-dimethoxy-2-pyrimidinyl)thio] benzoic acid, sodium salt} applied postemergence. Occasionally, though, moderate-to-severe injury has been observed in the field. Empirical evidence suggests this injury is related to cool temperatures during or near the time of application. A growth chamber experiment studied the effect of temperature on cotton cv. Deltapine 51's response to pyriithiobac applied postemergence. Cotton was grown at 31/24 °C (day/night), except for exposure to cool temperatures (21/8 °C) for 5 d before, 5 d after, or 5 d before *and* after pyriithiobac application. Pyriithiobac caused visible chlorosis and reduced leaf chlorophyll content 4 to 5 d after treatment but had no effect on other parameters. Cool temperatures reduced cotton height and shoot dry weight 14 d after pyriithiobac application, with reductions dependent upon length but not time of exposure. Results were similar when exposure occurred either 5 d before or 5 d after application, but exposure for 10 d caused greater reductions. Exposure to cool temperatures reduced square production, with exposure for 5 d before pyriithiobac application having a greater impact than exposure for 5 d after application. Exposure to cool temperatures for 5 d before or 5 d after pyriithiobac application increased nodal position of the first sympodium. The number of main stem nodes was reduced only on plants exposed to cool temperatures for 10 d. Lack of a temperature-by-pyriithiobac interaction suggests that the damage occasionally observed in the field under cool conditions may be due to a combination of stress factors.