

Title Seasonal variation in the response of 'Valencia' orange to two abscission compounds.
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Abstract

Two field studies were conducted to evaluate the effect of metsulfuron-methyl and 5-chloro-3-methyl-4-nitro-1H-pyrazole (CMN-pyrazole) on abscission of Valencia orange (*Citrus sinensis*) during the 3-month harvest season. Solutions of metsulfuron-methyl at 0.5, 1 and 2 mg.L⁻¹ active ingredient (a.i.) were applied at 10-day intervals beginning on 13 February and ending 18 May 1998. Early in the harvest season, 1 or 2 mg.L⁻¹ metsulfuron-methyl significantly reduced fruit detachment force (FDF) 14 days after application. Metsulfuron-methyl was less effective during a 4- to 6-week period following flowering ("less-responsive period"). After this period, metsulfuron-methyl regained the ability to loosen fruit. Applications of 2 mg.L⁻¹ a.i. were more effective than 1 mg.L⁻¹ in reducing FDF and causing leaf drop, but 0.5 mg.L⁻¹ a.i. had little or no effect on FDF. Flowers and leaflets on developing shoots and young fruit completely abscised with 1 and 2 mg.L⁻¹ a.i. Defoliation and twig dieback was extensive at all concentrations and spray dates, eliminating metsulfuron-methyl as a commercially viable abscission agent for citrus. In a separate experiment CMN-pyrazole at 50 and 100 mg.L⁻¹ a.i. and metsulfuron-methyl at 0.5 mg.L⁻¹ a.i. were applied to Valencia trees to determine fruit removal with a trunk shake and catch harvesting system. Application of both abscission materials before and after the "less-responsive period" resulted in a 10-12% increase in fruit removal when compared to control trees. Less than a 35% reduction in FDF was sufficient to significantly increase fruit removal. Only 100 mg.L⁻¹ a.i. CMN-pyrazole significantly increased fruit removal when applied during the "less-responsive period."