

Determination of spinetoram in leafy vegetable crops using liquid chromatography and confirmation via tandem mass spectrometry

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Abstract

Spinetoram is a second-generation member of the spinosyn class, all members of which have been shown to be effective in insect control via a novel mode of action. Spinetoram is a mixture of 3'-O-ethyl-5, 6-dihydro spinosyn J (XDE-175-J) and 3'-O-ethyl spinosyn L (XDE-175-L). In order to establish a determination method for the analysis of spinetoram residues in crops, commercial product (5% suspension concentrate spinetoram) was applied to two leafy vegetables (Garland chrysanthemum and Aster scaber) on different spraying schedules. The analytical method used herein was based on a reversed-phase separation on a C(18) column, isocratic elution and UV detection. The analytes were confirmed via tandem mass spectrometry. The method was linear over a concentration range of 0.05-10 ppm with a correlation coefficient in excess of 0.9998. The recoveries of XDE-175-J and XDE-175-L from the two vegetables ranged between 86.04 and 98.87% at spiking levels of 1 and 5 ppm. The relative standard deviations were no more than 7% for all recovery tests conducted herein. The calculated limits of detection and quantification were 0.01 and 0.03 ppm for both XDE-175-J and XDE-175-L. The levels of residues in two vegetables treated under a fixed schedule in the greenhouse were 6.21-0.55 ppm (maximum residue limit (MRL) = 7 ppm). In sum, this method constitutes an easy and reliable technique for the determination of spinetoram in leafy vegetables.

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