

Residual Fate and Dissipation Behavior of Hexythiazox in Rose

Bappa Ghosh^{1,2}, Sankhajit Roy², Saktipada Das¹, Anjan Bhattacharyya²

¹Department of Chemistry, University of Kalyani, Kalyani-741235, West Bengal

²Department of Ag. Chemicals, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur-741252, West Bengal

Abstract Rose (*Rosa chinensis*) is one of the important commercial cultivated flowering plant in India having medicinal properties. One of the major constrain of rose cultivation is the infestation of the crop with different mites which cause a considerable yield loss. To combat mites, different acaricides are being used. Hexythiazox ((4RS,5RS)-5-(4-chlorophenyl)-N-cyclohexyl-4-methyl-2-oxo-1,3-thiazolidine-3-carboxamide) has novel acaricidal chemistry with marvelous ovicidal and nymphicidal properties. As the compound is new for flowering plant, there is no standard method for residue analysis in rose. Thus we developed an effective analytical method for the quantification of Hexythiazox (MAIDEN 5.45EC) in rose flowers and its oil using triple quad GC-MS in MRM mode. The method includes extraction with hexane for rose flowers followed by clean up using dispersive solid phase extraction (d-SPE) with primary-secondary amine (PSA). For the quantification of Hexythiazox on rose oil, hexane soaked petals were extracted separately in soxhlet with 1% acetone in hexane, partitioned with acetonitrile and cleaned up by d-SPE. The recovery percentage was ranged between 86-110% for all matrices having RSDa < 20% (n=6) and correlation coefficient (R^2) of matrix matched calibration curves were ≥ 0.99 . The method was also sensitive enough to set the LOQ 20 ng/g for rose flowers and oil. To find out the persistence behavior, a multilocation supervised field experiment at four different locations (viz. Rajendranagar, Nauni Solan, Dhakrani and Birbhum) were conducted where Hexythiazox was applied @ 25 g and 50 g a.i.ha⁻¹ and showed that residue was determined below quantification limit after the 7th day of application on the rose with range of half-life 1.15-1.65 days on flower and 1.27-1.86 days on oil. No residue of Hexythiazox was quantified in soil at harvest. According to the UK/EC MRLs 0.05 mg kg⁻¹ in rose, the preharvest interval (PHI) of rose flower was calculated as 6-7 days for the present study.

Keywords: Hexythiazox, Rose, Qqq GC-MS/MS, d-SPE, Residue, Dissipation, Half-life.