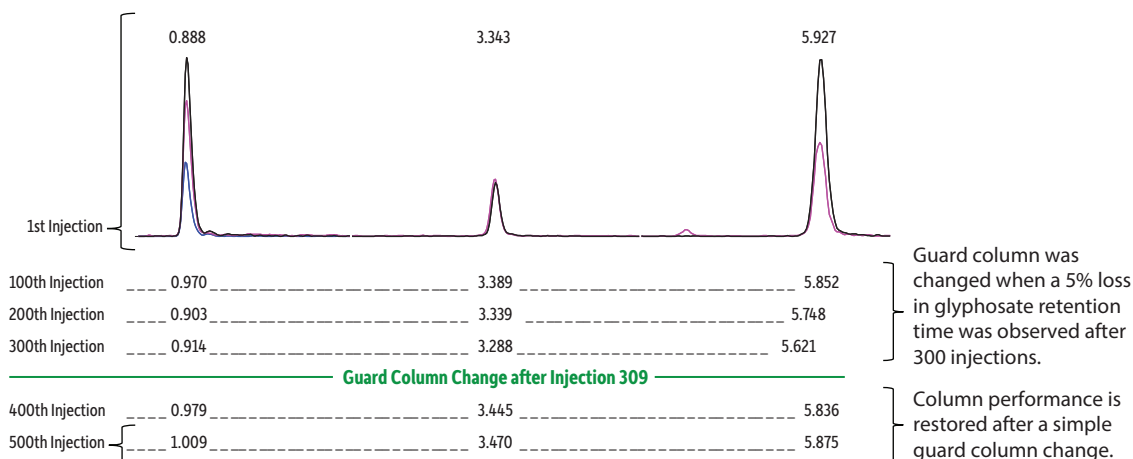


# Polar Pesticides in Spinach on Raptor Polar X by LC-MS/MS

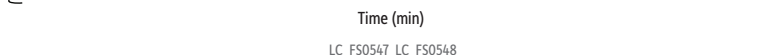
Analyte Retention Times (min) over 500 Injections of Spinach Extract



Analytical column performance remained robust even after hundreds of matrix injections.

Guard column was changed when a 5% loss in glyphosate retention time was observed after 300 injections.

Column performance is restored after a simple guard column change.



Peaks	tr (min)	Conc. (ng/mL)	Precursor Ion	Product Ion 1	Product Ion 2	Product Ion 3
1. AMPA	0.888	100	110.10	79.05	63.10	81.10
2. Glufosinate	3.343	100	180.20	85.15	95.10	-
3. Glyphosate	5.927	100	168.10	63.05	79.05	-

**Column** Raptor Polar X (cat.# 9311A32)  
 Dimensions: 30 mm x 2.1 mm ID  
 Particle Size: 2.7 µm  
 Pore Size: 90 Å  
 Guard Column: Raptor Polar X guard column cartridge 5 mm, 2.1 mm ID, 2.7 µm (cat.# 9311A0252)  
 Temp.: 35 °C  
**Sample** Spinach extract  
 Inj. Vol.: 2 µL  
**Mobile Phase**  
 A: Water, 0.5% formic acid  
 B: Acetonitrile, 0.5% formic acid

Time (min)	Flow (mL/min)	%A	%B
0.00	0.5	35	65
5.0	0.5	90	10
6.5	0.5	90	10
6.51	0.5	35	65
8	0.5	35	65

**Detector** MS/MS  
 Ion Mode: ESI-  
 Mode: MRM  
**Instrument** UHPLC  
**Notes**

Frozen spinach was added to a Blixer processor with dry ice (3:1-4:1 ratio) and then ground into a very fine powder. The homogenate was placed into the freezer immediately. A 5.0 gram sample of the spinach powder was weighed into a 50 mL centrifuge tube (cat.# 25846). According to the QuPPE method (Quick Polar Pesticides Method), 5.0 mL of methanol with 1.0% formic acid was added into the centrifuge tube. The tube was shaken by hand for 1 min and then by a mechanical shaker vigorously for 5 min. After centrifuging for 10 min at 4200 rpm, the supernatant was filtered through a 0.22 µm filter (cat.# 23984). The final extract was fortified with the AMPA, glufosinate, and glyphosate at a final concentration of 100 ng/mL.