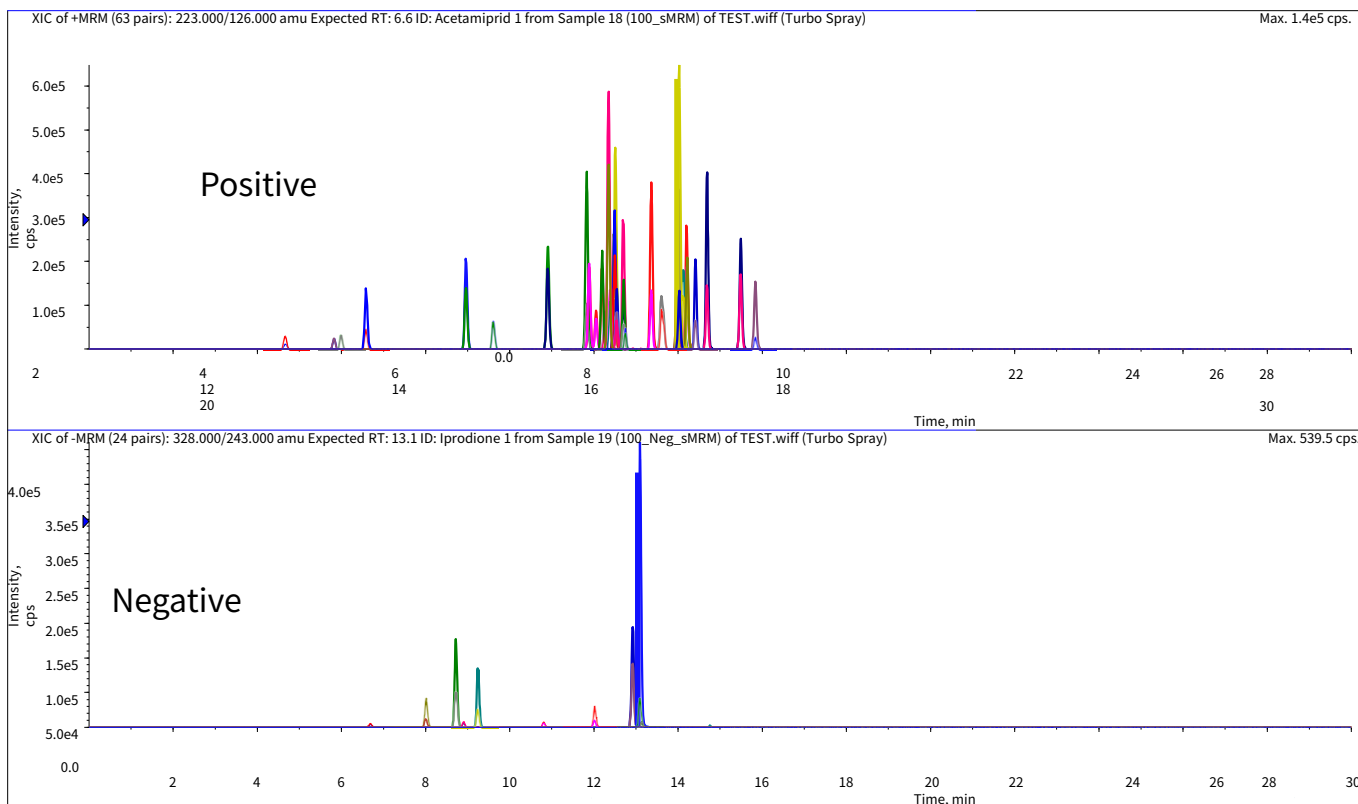


# Simultaneous LC/MS/MS Analysis of Pesticides Used in Golf Courses

In 1990, Japanese Ministry of the Environment announced a “Interim Guidance Guidelines on Prevention of Water Contamination by Pesticides for Golf Courses”. Furthermore, the last revision 100929001 announced by the Environment Management Bureau, Ministry of Environment on Sep 29, 2010, states to measure 44 pesticides by LC/MS/MS.

Both quantifier and qualifier ions must be measured besides fenitrothion.

In this technical note, we introduce results of simultaneous analysis of 43 pesticides using 3200 QTRAP LC/MS/MS System (AB SCIEX) and InertSustain C18 HPLC column.



## Conditions

- Column** : InertSustain C18 3  $\mu$ m, 150  $\times$  2.1 mm I.D.
- Eluent** : A) 5 mM Ammonium acetate  
 B) CH<sub>3</sub>OH  
 A/B = 80/20 - 13 min - 10/90 -10 min hold, v/v  
 \* Reequilibration for next analysis: 7 min
- Flow rate** : 0.25 mL/min
- Col. Temp.** : 40 °C
- Detection** : LC/MS/MS (3200 QTRAP: ESI, MRM)
- Inj. Vol.** : 5  $\mu$ L
- Data Supply** : Mr. Tateda in AB SCIEX, Japan

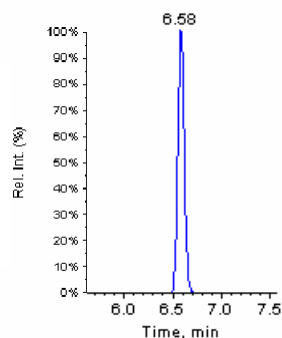
MRM (Q1/Q3)		Quantifier
Components	Qualifier	
<u>Positive</u>		
ion		R.T.
Thiamethoxam	292/132	
	292/211	
4.7 Imidacloprid	256/175	
	256/209	
5.8 Clothianidin	250/132	
	250/169	
6.0 Acetamiprid	223/126	
	225/128	
6.6 Ethoxysulfuron	399/261	
	399/218	
9.0 Simazine	202/104	
	202/68	
9.6 Metalaxyl	280/220	
	280/192	
10.9 Azoxystrobin	404/372	
	404/329	
11.8 Siduron	233/137	
	233/94	
11.9 Flutolanil		
324/242	324/262	12.2
Propyzamide		256/190
258/192	12.4	
Mepronil		270/119
270/91	12.4	
Isoprothiolane		291/231
291/189	12.5	
Cafenstrole		351/100
351/72	12.5	
Cumyluron		303/185
303/125	12.5	
Cyproconazole		292/70
292/125	12.5	
Simeconazole		294/73
294/70	12.7	
Tetraconazol		372/159
372/70	12.7	
Triflumizole metabolite		
295/215	295/176	12.8
Tebuconazole		308/70
310/70	13.4	
Propiconazole		342/159
344/161	13.6	
Diazinon		305/169
305/97	14.0	
Butamifos		333/180
333/96	14.0	
Pencycuron		329/125
329/89	14.0	
Difenoconazole		406/251
408/253	14.1	
Isoxathion	314/105	314/97 14.2
Terbucarb	278/222	278/166 14.2
Triflumizole	346/278	348/280 14.4
Oxaziclomefone	376/190	376/161 14.7
Pyributicarb		331/181
331/108	15.5	
Pendimethalin		282/212
	282/194	15.8

MRM (Q1/Q3)		Quantifier
Components	Qualifier	
<u>Negative</u>		
ion		R.T.
Flazasulfuron	406/154	406/251
	406/154	
6.7 Harosulfuron-methyl	433/252	
	433/78	
8.0 Cafenstrole metabolite	250/186	
	250/67	
8.7 Triclopyr	254/196	
	256/198	
8.9 Mecoprop	213/141	
	215/143	
9.3 Cyclosulfamuron	420/265	
	420/78	
10.8 Boscalid	341/112	
	343/112	
12.0 Thifluzamide	527/125	
	527/166	
12.9 Iprodione	328/243	
	330/245	
13.1 Tebufenozide		
351/149	351/105	13.1
Bensulide		396/213
396/111	13.1	
Dithiopyr		400/352
	400/304	14.8

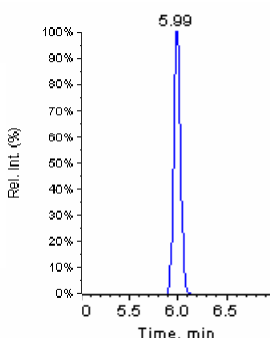
(Conc. of each compound: 100 µg/L)

<Compounds to be detected LC/MS/MS (ESI, Positive) - 1>

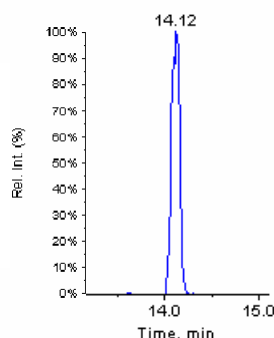
Acetamidiprid



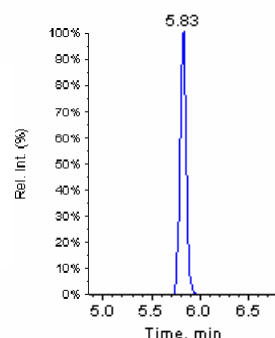
Clothianidin



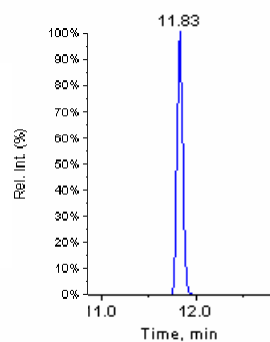
Difenoconazole



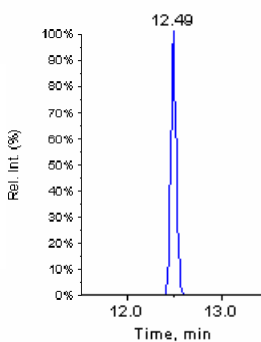
Imidacloprid



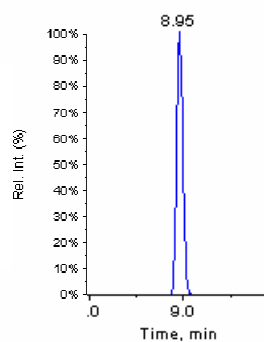
Azoxystrobin



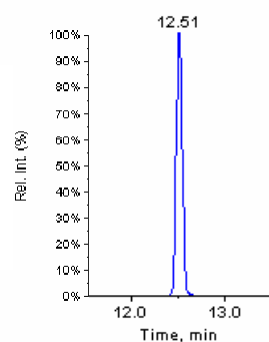
Cumyluron



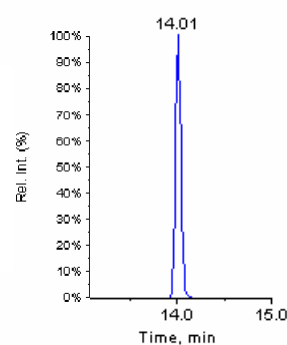
Ethoxysulfuron



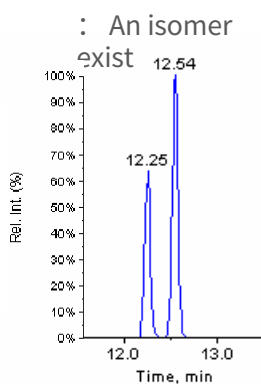
Isoprothiolane



Butamifos

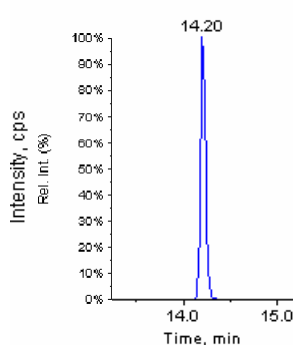


Cyproconazole

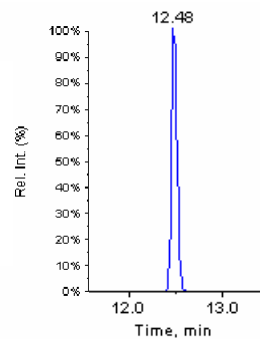


: An isomer exist

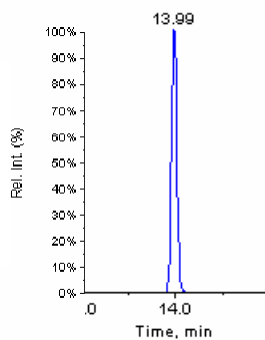
Isoxathion



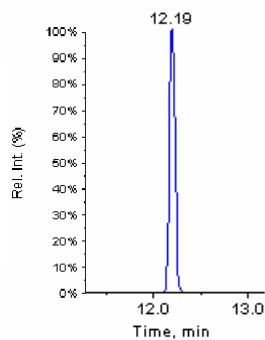
Cafenstrole



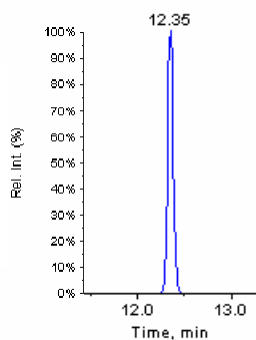
Diazinon



Flutolanil

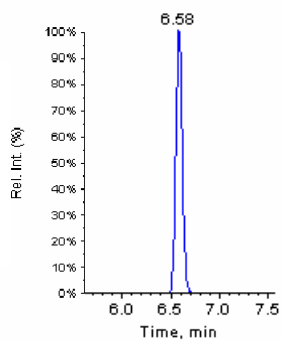


Mepronil

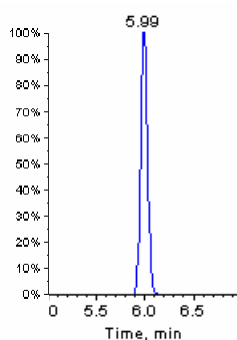


<Compounds to be detected by LC/MS/MS (ESI, Positive) - 2>

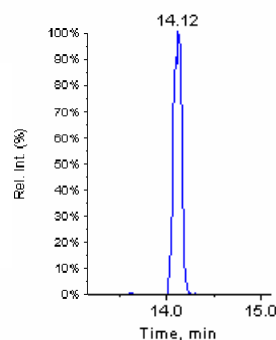
Acetamiprid



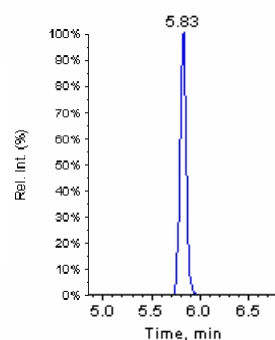
Clothianidin



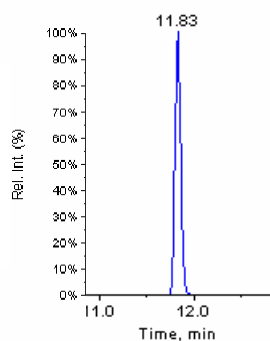
Difenoconazole



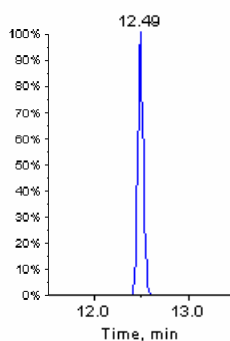
Imidacloprid



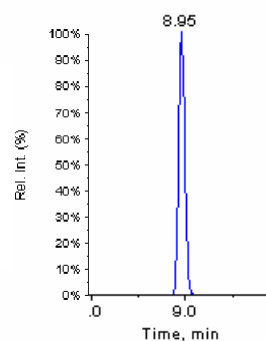
Azoxystrobin



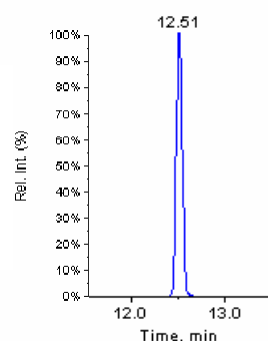
Cumyluron



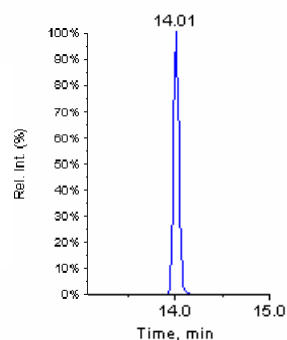
Ethoxysulfuron



Isoprothiolane

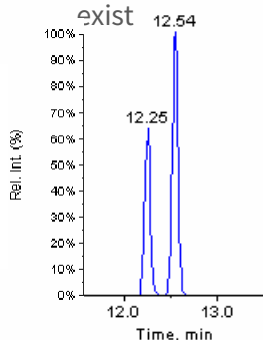


Butamifos

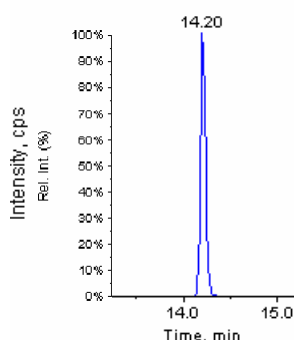


Cyproconazole

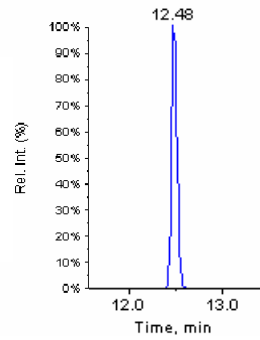
: An isomer exist



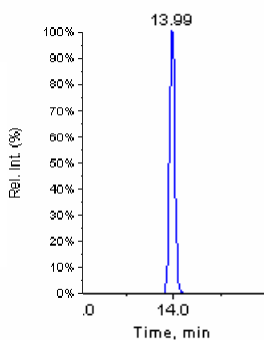
Isoxathion



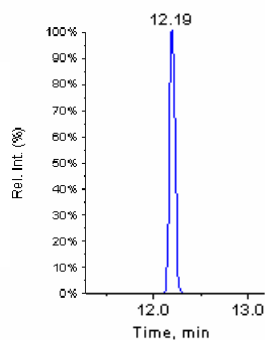
Cafenstrole



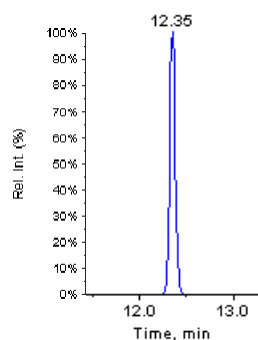
Diazinon



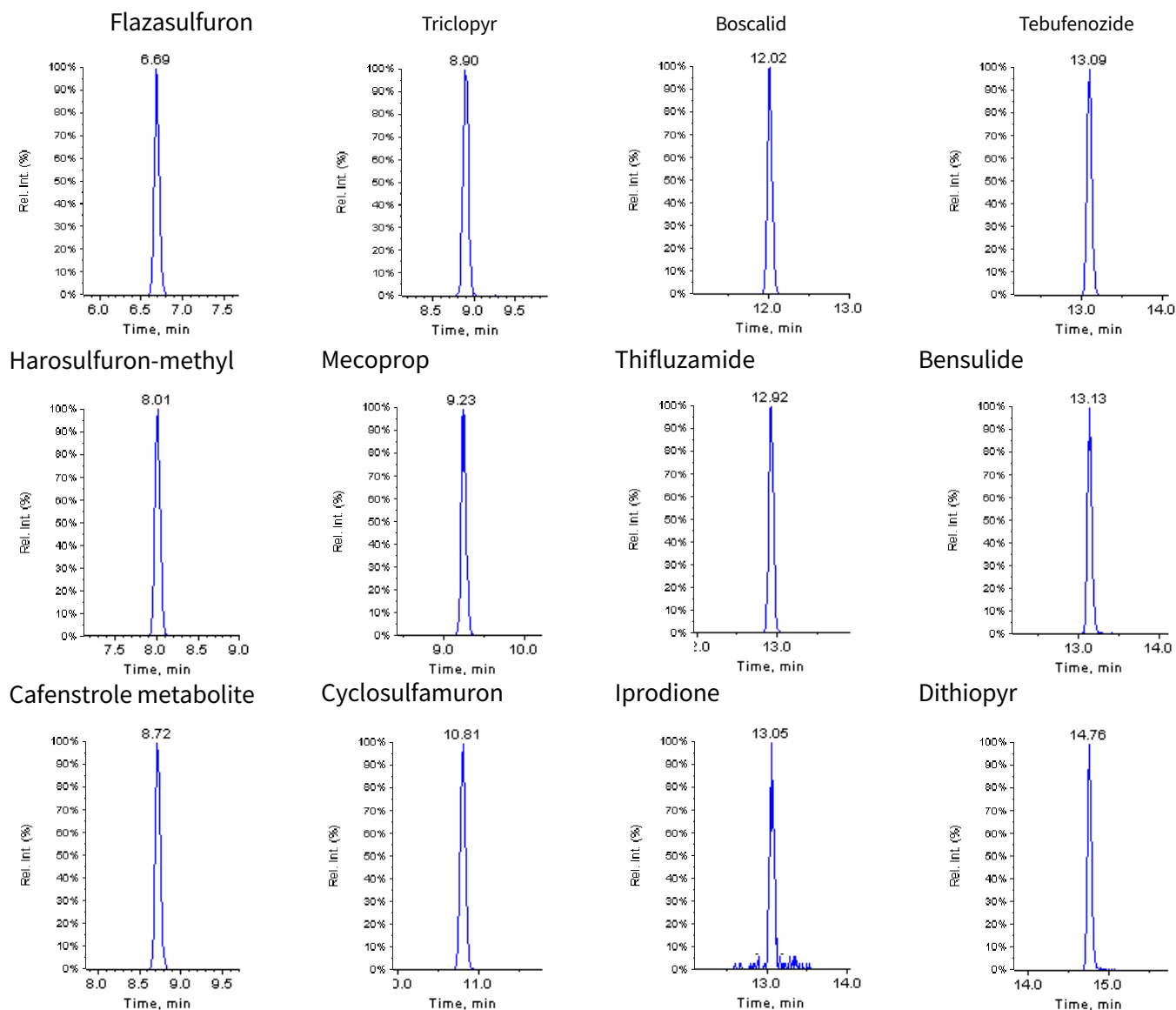
Flutolanil



Mepronil



<Compounds to be detected by LC/MS/MS (ESI, Negative)>



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