NOVARTIS SAM No. 6061

Novartis Crop Protection AG
Residue Analysis
CH-4002 Basel/Switzerland

This study complies with Annex IIA, point 6.3, or Annex IIIA, point 8.2
(European Union, Council Directive 91/414/EEC, 15 July 1991).

FINAL REPORT

TITLE:

RESIDUE STUDY WITH PROSULFURON (CGA 152005) AND PYRIDATE (SAN 319) IN OR ON MAIZE IN FRANCE (NORTH)

GLP-Study Number: 3096/98

Report Number: 3096/98

Author: André Gasser (Study Director)

Report Date: 1 September 1999

EXPERIMENTAL START: 04 JUNE 1998

EXPERIMENTAL COMPLETION: 30 JUNE 1999

STUDY TYPE: HARVEST

RESIDUES OF ACTIVE INGREDIENT CGA 152005 AND SAN 319 IN MAIZE (COBS), MAIZE (GRAINS), MAIZE (REMAINDER), AND MAIZE (WHOLE PLANT) AFTER FOLIAR APPLICATION OF FORMULATED PRODUCT WP 45 + WG 75 (A-8985 A + A-8714 C), CONTAINING PYRIDATE (SAN 319) AND PROSULFURON (CGA 152005).

DETERMINATION OF ANALYTES CGA 152005 AND SAN 1367.

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1. GENERAL

1.1 AIM AND DESCRIPTION OF THE STUDY

Generation of residue results for the registration of plant protection products.
Magnitude of residues in maize (cobs), maize (grains), maize (remainder), and maize (whole plant).
Outdoor foliar application of pyridate (SAN 319) and prosulfuron (CGA 152005) as formulated product WP 45 + WG 75 (A-8985 A + A-8714 C).
Determination of CGA 152005 and SAN 1367.

1.2 REMARKS AND EVENTS AFFECTING THE STUDY

None.

1.3 TEST SUBSTANCE

Formulation type and content:	WP 45 + WG 75	Batch No.:	91507 + P712015
Formulation company code:	A-8985 A + A-8714 C	Re-analysis date:	May 2000
Test substances:	Pyridate (SAN 319) + Prosulfuron (CGA 152005)		

1.4 GUIDELINES

- OECD Principles on GLP (as revised in 1997) [C(97)186/Final]
- Procedures and Principles of Switzerland, and of other OECD countries where a GLP test facility was involved (if applicable)
- FAO Guidelines on Producing Pesticide Residues Data from Supervised Trials (Rome, 1990)
- Commission of the European Communities, 7029/VI/95 (rev. 5, working document)
- Guidelines and Criteria for the Preparation and Presentation of Complete Dossiers and of Summary Dossiers for the Inclusion of Active Substances in Annex I of Directive 91/414/EEC (Article 5.3 and 8.2), 1996.

2. STUDY ORGANISATION

Sponsor:	Novartis Crop Protection AG, Dietary Safety Assessment, CH-4002 Basel Dr. M. Kaethner (representative)	
Test facilities:		
- biological part:	Novartis Agro S.A., F-30670 Aigues-Vives, France F.X. Metz (principal investigator)	
- analytical part:	Novartis Crop Protection AG, Residue Analysis, CH-4002 Basel André Gasser (study director) Dr. S. Sack (responsible for the analysis of prosulfuron)	
Study dates:	protocol issued	6 May 1998
	date of (first) application	4 June 1998
	date of (last) sampling	6 October1998
	shipment period	2 October and 4 December 1998
	specimen preparation	5 March 1999
analyses on:	CGA 152005	23 – 30 June 1999
	SAN 1367	4 – 12 June 1999
Archives:	Raw data of the biological part are in the archives of the biological facility; other raw data, protocol and reports are in the archives of Residue Analysis; specimens are not retained.	

3. STATEMENT OF GLP COMPLIANCE

This study was performed in compliance with the OECD Principles of Good Laboratory Practice, adopted May 12, 1981 by Decision of the OECD Council [C (81) 30 (Final)] concerning Mutual Acceptance of Data in the Assessment of Chemicals (as revised in 1997) [C(97)186/Final], and the Procedures and Principles of GLP in Switzerland (issued by the Federal Department of the Interior).
The test facilities which conducted parts of this study were confirmed to be compliant with GLP.

Exempted from GLP are the following data or activities:
- weather and climatic conditions, - soil characterization, - maintenance treatments.

1-SEP-1999

Date André Gasser (Study Director)

4. REPORT ON BIOLOGICAL PART

4.1 GENERAL

Biological facility: Novartis Agro S.A., F-30670 Aigues-Vives, France

Principal Investigator: F.X. Metz

TEST SYSTEM

Village/region:	F-45480 Chatillon le Roi, France (North)	Farm/facility:	Le Climart
System treated:	maize	Variety:	Anjou 285
Sowing:	30 April 1998		
Size per plot:	60 sqm	Plant density:	110000 plants/ha
Normal harvest in:	From 9 October 1998	Date of flowering:	Not recorded
Type of soil:	Clay; pH: 7.4		

4.2 TREATMENT

Active Ingredients and content in formulation:

Active Ingredients (a.i.)	Nominal content in formulation [g/kg]	No. of applications and nominal rate [g/ha]	Total nominal amount applied [g/ha]
Prosulfuron (CGA 152005)	750	1 x 15	15
Pyridate (SAN 319)	450	1 x 600	600

Application	4 June 1998
Development stage [BBCH]	BBCH 17
Spray solution [L/ha]	300
CGA 152005 [g/L]	0.05
Rate [g/ha]	15
SAN 319 [g/L]	2.03
Rate [g/ha]	608

Application method and equipment:	Foliar application with knapsack boom sprayer
Weather conditions:	Rainfall within 24 hours after last application: none Wind speed at last application: 1 m/s
Cultivation:	20.08.97: fertilizer P 87 units/ha, K 145 units/ha End of March 1998: N 200 units/ha 21.11.97: ploughing, end of March: heavy harrow, 29.04.98: cultivator Sprinkler irrigation: 210 mm
Other pesticides:	Lindafor 1.2 L/ha on 27.03.98, Ducat 0.4 L/ha on 15.07.98
Remarks:	none

4.3 SPECIMEN COLLECTION AND SHIPMENT

Collection dates	Days after applic. (DAA)	Crop development stage [BBCH]	Parts collected	Size of specimen (# of items)	Number of specimens collected
18 Aug 1998	75	BBCH 73	*whole plant**	5.2 kg	1 treated
18 Aug 1998	75	BBCH 73	*whole plant**	4.8 kg	1 control
27 Aug 1998	84	BBCH 75	*cobs***	2.35 kg	1 treated
27 Aug 1998	84	BBCH 75	*cobs***	2.15 kg	1 control
27 Aug 1998	84	BBCH 75	*remainder***	2.55 kg	1 treated
27 Aug 1998	84	BBCH 75	*remainder***	2.45 kg	1 control
6 Oct 1998	124	BBCH 89	grains	2.2 kg	1 treated
6 Oct 1998	124	BBCH 89	grains	2.2 kg	1 control

Method of sampling: manual

Reduction of specimens in size: no

Preparation of specimens before shipment: none

Storage temperature until shipment: -20°C (between 03.09.98 17:00 and 05.09.98 05:00: temperature raised up to –5.9°C, between 09.09.98 21:00 and 10.09.98 11:00: temperature raised up to –0.6°C)

Conditions of shipment: frozen

Remarks: * *the 75 DAA field specimens were received as 3 separated specimens (leaves, stems and cobs with husk); at sample preparation they were bulked into 1 specimen (= whole plant).*

*** the 84 DAA field specimens were received as 3 separated specimens (leaves, stems and cobs with husk); at sample preparation they were bulked as 2 specimens: 1 specimen with leaves, stems and husk of cobs (= remainder) and 1 specimen of cobs without husk (= cobs).*

4.4 CLIMATIC CONDITIONS

Detailed climatic conditions are reported in the attached report on weather data.

This report on biological part of the study was written by the study director, based on the report on biological part submitted by the principal investigator.

5. REPORT ON ANALYTICAL PART

5.1 GENERAL

Test facility: Novartis Crop Protection AG, Residue Analysis, CH-4002 Basel

Specimen preparation: Whole plant, cob and remainder specimens were chopped and homogenized with dry ice in a vertical cutter, then milled and homogenized with dry ice in a cross beater mill. Grain specimens (1 kg per specimen) were milled and homogenized with dry ice in a cross beater mill.

Dry matter content was determined for the whole plant and remainder specimens by drying about 2 g of sample using an infra-red oven at 160°C until weight variation was lower than 1 mg/30 seconds.

Storage conditions: At or below minus 18 °C

Quantitation: By alternate injections of cleaned up specimens and external standards. Interpolation by method of weighted least squares, regression of 1st order (according to General Calculation Method REM 119.06).

SAN 319 (pyridate) is quantified as its main metabolite SAN 1367. SAN 1367 recovery results from specimens fortified with SAN 319 were converted to SAN 319 using the stoichiometric factor f = 1.833.

		Reference substances description:		
Analysis on:	Method used:	Batch	purity	expiration date:
SAN 1367	REM 191.01	SAN 319:		
		PCHB 1074	98.9%	October 2000
		SAN 1367:		
		PCHB 1086	98.9%	August 2000
CGA 152005	REM 156.05	CGA 152005:	99.5%	August 2000
		AMS 509/102		

Modifications to REM 191.01

Section 2.3.3: adjust remaining extraction volume after evaporation to 19 mL instead of 25 mL.
Section 2.3.4: add 13 mL ethylacetate instead of 20 mL.
Section 2.3.6: clean-up by C18 SPE was not performed.
Section 2.3.7: Add 1 mL of hydrochloric acid (32%) and 0.5 mL of 1M sodium chloride solution to the remaining solution of section 2.3.5. Transfer the solution onto the extraction column (Chem-Elut). After waiting for 10 min., elute SAN 1367 four times with 20 mL n-hexane/tert-butyl methyl ether (1 vol. + 1 vol.). Wait about 3-5 min. between the single elution steps. Elute into a 100 mL round bottom flask containing exactly 8 ml of injection solution (weigh the flask after addition of the injection solution).
Section 2.3.8: adjust the final volume to 8 mL.

Modifications to REM 156.05 (short version for LC-MS-MS)

Extraction was performed according to method REM 156.05, but instead of 3 g substrate 5 g were extracted. The volume of extraction solvent was increased accordingly (extraction with 50 mL instead of 30 mL extraction solvent) in order to maintain the same solid/liquid ratio for the extraction procedure as given in REM 156.05. After filtration of the extract the extract volume is adjusted with extraction solvent to 100 mL (no estimation of volume contribution of substrate solubles as in original REM 156.05). Final determination was performed by LC-MS-MS on a triple stage quadrupole instrument. Due to the high sensitivity and selectivity of this technique all clean-up steps of REM 156.05 could be omitted. Final solutions for the LC-MS-MS analysis were prepared by dilution of 1 mL aliquots of the filtered crude extracts with each 3 mL water. External standards were prepared in methanol/ water (15 vol. + 85 vol.). Standard concentrations were 0.125 ng/mL (corresponds to LOQ = 0.01 mg/kg), 0.25 ng/mL, 0.50 ng/mL, 1.0 ng/mL (10 x LOQ) and 5.0 ng/mL.

Typical conditions of final determination by LC-LC-MS-MS:

A) HPLC (2-column-switching system):

Instrumentation:	Pumps: Shimadzu 10AD, Autosampler: Shimadzu SCL 10A
Column 1:	Discovery C18, 5 µm, 50 mm x 2.1 mm I.D.
Column 2:	Inertsil Phenyl, 5 µm, 100 mm x 2.0 mm I.D.
Eluent 1:	Acetonitrile/water (55 vol. + 45 vol.), + 0.2 % formic acid, flow rate: 250 µL/min
Eluent 2:	Acetonitrile/water (70 vol. + 30 vol.), + 0.2 % formic acid, flow rate: 250 µL/min
Injection volume:	50 µL (6.25 pg injected on column at the lowest standard concentration);
Retention times:	Column 1: 1.8 min (cut: 1.65 – 2.05 min); Column 1 + 2: 3.6 min

B) MS-MS-Detection:

Instrumentation:	Perkin-Elmer Sciex API 3000 triple stage quadrupole mass spectrometer operated at unit mass resolution on both mass analyzers (Q1 and Q3)
Ion source:	Turbo ion spray (pneumatically assisted electrospray), 400 °C
Polarity:	Positive ion mode
Diagnostic masses:	420 m/z ($[M+H]^+$) -> 141 m/z (primary transition / quantifier)
	420 m/z ($[M+H]^+$) -> 167 m/z (secondary transition /qualifier)
Collision energy:	Quantifier: 19.5 eV
	Qualifier: 18.5 eV
Dwell times:	250 ms (each transition)
Acquisition mode:	Multiple reaction monitoring (MRM).

For final quantitation peak areas obtained from chromatograms based on the extracted ion current of the primary transition were used. Quantitation was performed in accordance with internal SOPs and the general calculation method REM 119.06.

Identity of prosulfuron peaks was confirmed by Ion Ratios (I):

I = peak area of primary transition / peak area of sec. transition. Test criteria: Iu = Is ± 30%, i.e., 0.7 Is < Iu < 1.3 Is with Is = mean Ion Ratio of 5 standard injections, and Iu = Ion Ratio of an individual unknown.

5.2 RESULTS

Individual results:

Description of specimens	DAA	CGA 152005	SAN 1367	Unit	Dry matter content
TREATED					
whole plant	75	**< 0.01**	**< 0.02**	mg/kg	25.9%
cobs	84	**< 0.01**	**< 0.02**	mg/kg	n.d.
remainder	84	**< 0.01**	**< 0.02**	mg/kg	23.8%
grains	124	**< 0.01**	**< 0.02**	mg/kg	n.d.
CONTROLS					
whole plant	75	**< 0.01**	**< 0.02**	mg/kg	28.0%
cobs	84	**< 0.01**	**< 0.02**	mg/kg	n.d.
remainder	84	**< 0.01**	**< 0.02**	mg/kg	20.9%
grains	124	**< 0.01**	**< 0.02**	mg/kg	n.d.

Corrections of results: Were neither made for control values or recoveries nor for dry matter content
n.d.: not determined

Summary of results:

- No CGA 152005 residues equivalent to or above the limit of quantitation of 0.01 mg/kg were found in any of the treated field specimens collected between 75 and 124 days after the application.
- No SAN 1367 residues equivalent to or above the limit of quantitation of 0.02 mg/kg were found in any of the treated field specimens collected between 75 and 124 days after the application.

Recoveries in percent (%). The lowest fortification level is at the limit of quantitation:

Substrate (control)	Reference Substance added	Fortification Level [mg/kg]	Recoveries [%]
whole plant	CGA 152005	0.10 / 0.01	**95 / 98**
remainder	CGA 152005	0.10 / 0.01	**97 / 96**
cobs	CGA 152005	0.10 / 0.01	**99 / 95**
grains	CGA 152005	0.10 / 0.01	**110 / 97**
whole plant	SAN 319 (pyridate)	2.0	**92***
whole plant	SAN 1367	0.02	**101**
remainder	SAN 1367	0.20 / 0.02	**97 / 92**
cobs	SAN 1367	0.02	**89 (67)****
grains	SAN 1367	0.02	**95**

* SAN 1367 recovery found was converted to SAN 319 using the stoichiometric factor f = 1.833
** Result between brackets corresponds to the recovery corrected for the background in the corresponding control sample

Quality Assurance Statement

Novartis Crop Protection AG, GLP Quality Assurance, Prod. Safety Services, 4002 Basel

Study	**3096/98**
Test Item	**pyridate (SAN 319), prosulfuron (CGA 152005)**
Study Title	**Residue Study with Pyridate (SAN 319), Prosulfuron (CGA 152005) in or on Maize in France (North)**
Study Director	**André Gasser**
QA Inspector	**Lucien Gasser**

It is herewith confirmed that the following Quality Assurance activities were performed:

Activity	Performed	Reported
Facility Based Inspection	March 12, 1998	March 26, 1998
Study Plan Check	May 14, 1998	May 14, 1998
Facility Based Inspection	September 9, 1998	September 23, 1998
Facility Based Inspection	March 17, 1999	April 15, 1999
Process Based Inspection	June 8, 1999	June 9, 1999
Final Report Inspection	August 17, 1999	August 27, 1999

Quality Assurance of the biological part was performed by the QA Unit of the local test facility

September 03, 1999
Date

Lucien Gasser
Quality Assurance Inspector

Representative chromatograms

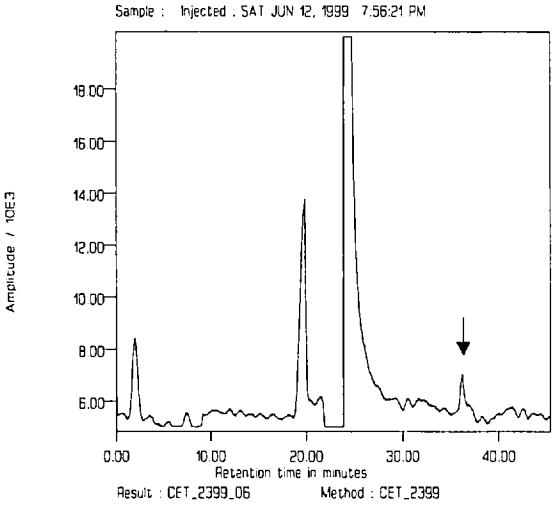
Analysis for SAN 1367:

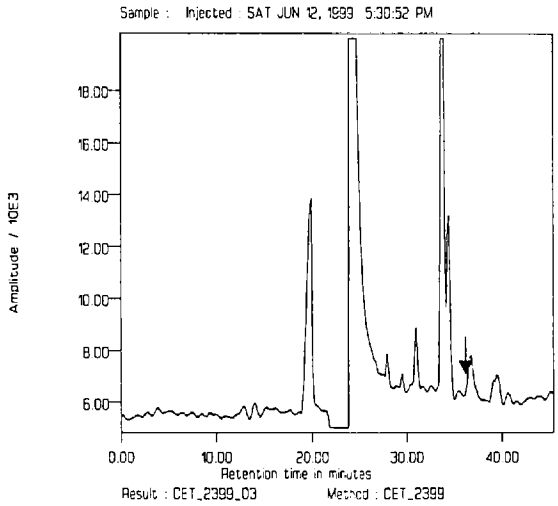
FSSI: Formal Specimen Size injected (g)

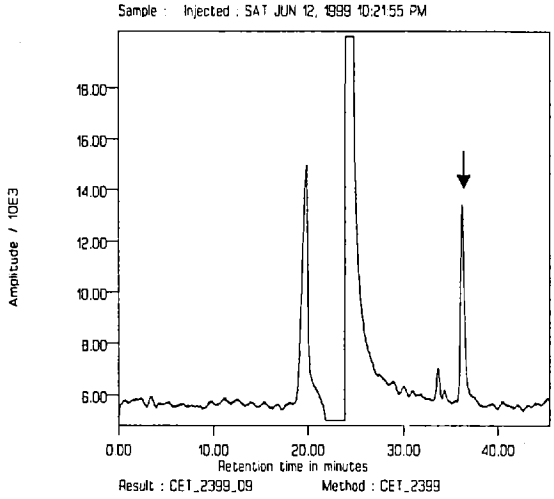
Code	Substrate	FSSI	Identification	SAN 1367 found
CET_2399_06	standard	-	SAN 1367 0.025 µg/mL	-
CET_2399_03	whole plant	0.250	Control 18.08.98	< 0.02 mg/kg
CET_2399_09	whole plant	0.025	Control 18.08.98 + 2.0 mg/kg pyridate	92%*
CET_2399_07	whole plant	0.250	Treated 18.08.98	< 0.02 mg/kg
CET_2399_11	remainder	0.250	Control 27.08.98	< 0.02 mg/kg
CET_2399_13	remainder	0.250	Control 27.08.98 + 0.02 mg/kg SAN 1367	92%
CET_2399_15	remainder	0.250	Treated 27.08.98	< 0.02 mg/kg
CET_2399_19	cobs	0.250	Control 27.08.98	< 0.02 mg/kg
CET_2399_23	cobs	0.250	Control 27.08.98 + 0.02 mg/kg SAN 1367	89% (67%)**
CET_2399_21	cobs	0.250	Treated 27.08.98	< 0.02 mg/kg
CET_2399_25	grains	0.250	Control 06.10.98	< 0.02 mg/kg
CET_2399_29	grains	0.250	Control 06.10.98 + 0.02 mg/kg SAN 1367	95%
CET_2399_27	grains	0.250	Treated 06.10.98	< 0.02 mg/kg

* SAN 1367 recovery found was converted to SAN 319 using the stoichiometric factor = 1.833

** Result between brackets corresponds to the recovery corrected for the background in the corresponding control sample



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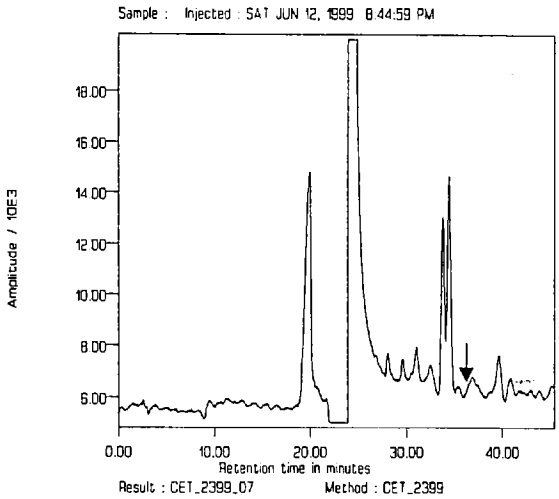
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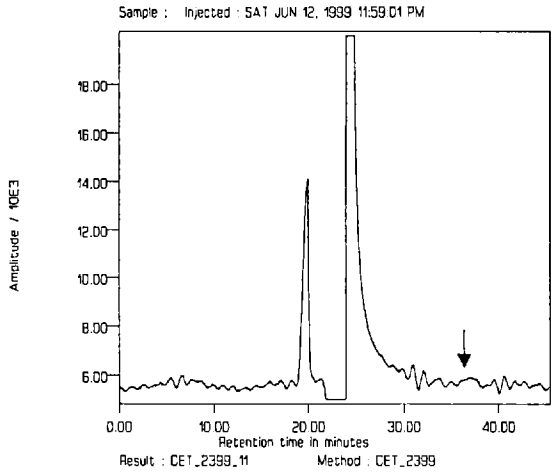
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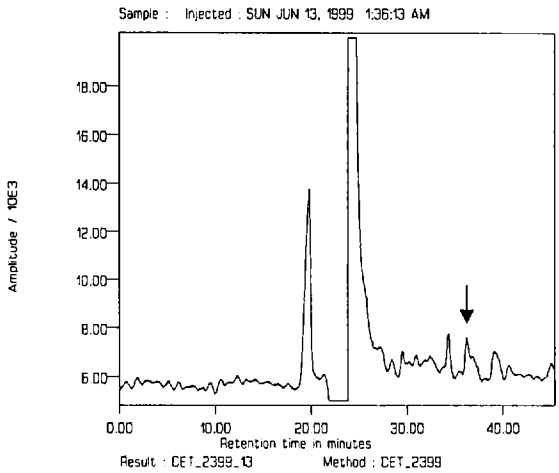
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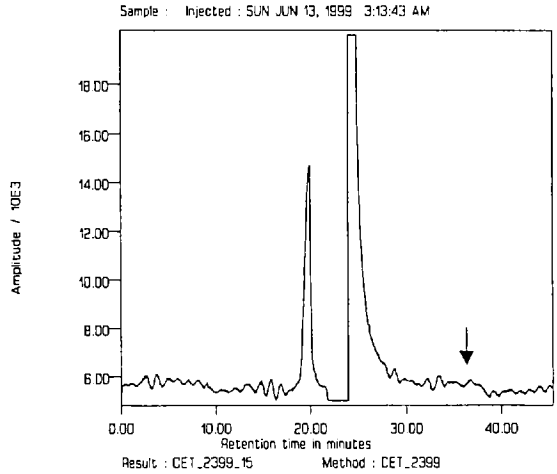
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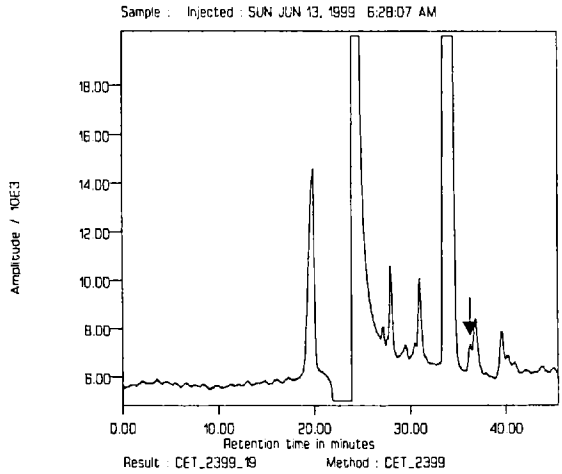
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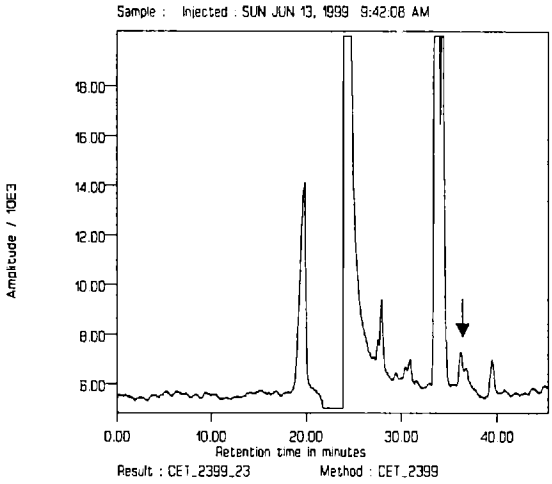
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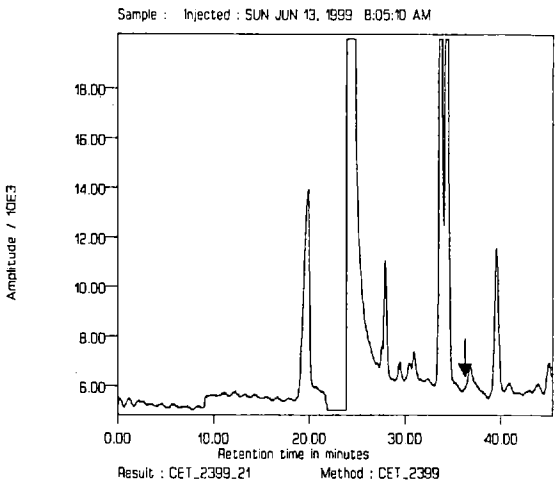
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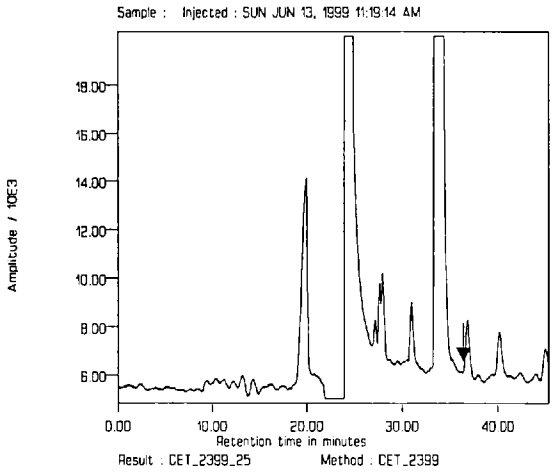
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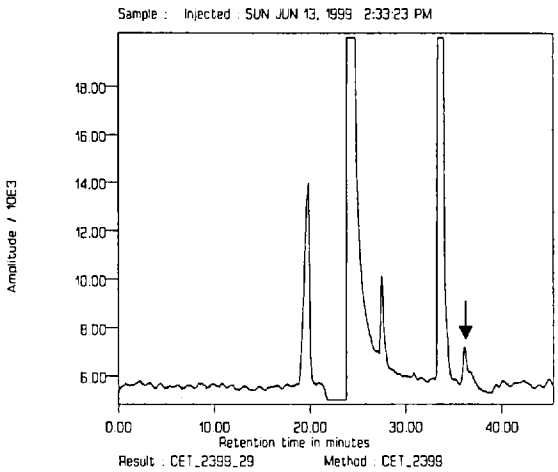
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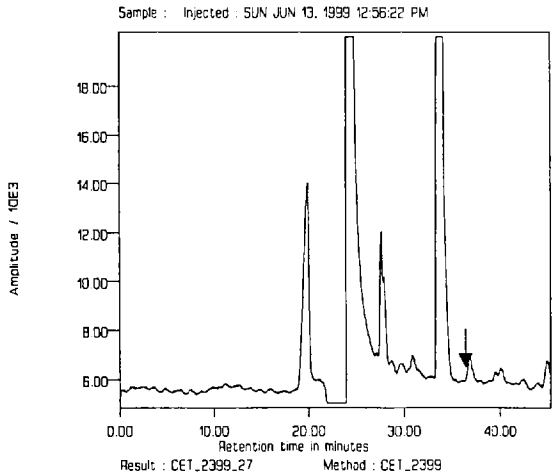
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Retention time in minutes
Result : CET_2399_27
Method : CET_2399

Representative chromatograms

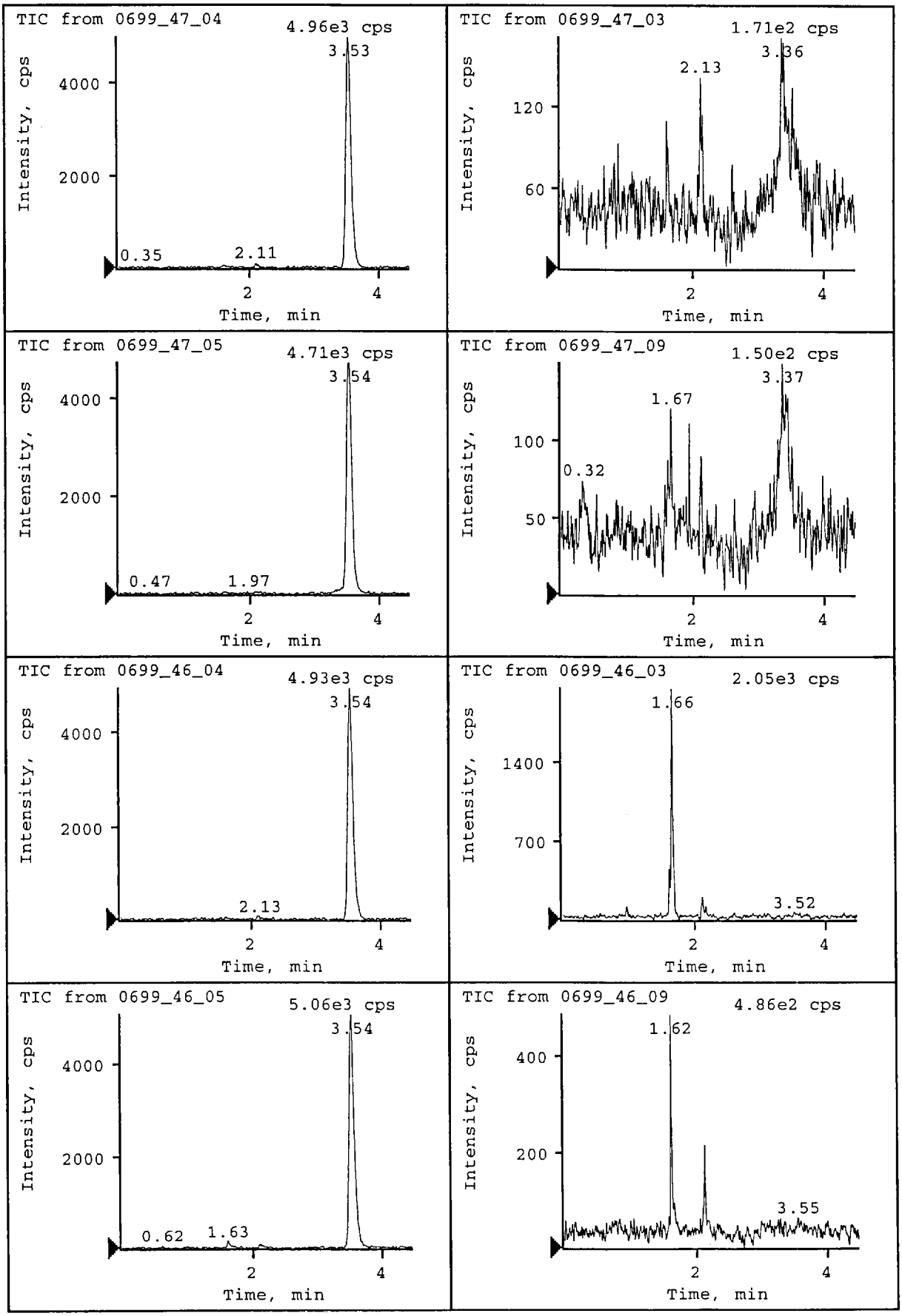
Analysis for CGA 152005:

Filename	Sample Description	Area (cps x sec)	R.T. (min)	FSSI (µg)	Result
0699_47_04	Standard 0.125 ng/mL	19147	3.53	-	-
	Maize, whole plant:				
0699_47_03	Control = A 18.08.98	n/a	n/a	625	< 0.01 mg/kg
0699_47_05	A + 0.01 mg/kg	18562	3.54	625	98 %
0699_47_09	Treated Specimen 18.08.98	n/a	n/a	625	< 0.01 mg/kg
0699_46_04	Standard 0.125 ng/mL	19088	3.54	-	-
	Maize, grain:				
0699_46_03	Control = B 06.10.98	n/a	n/a	625	< 0.01 mg/kg
0699_46_05	B + 0.01 mg/kg	18677	3.54	625	97 %
0699_46_09	Treated Specimen 06.10.98	n/a	n/a	625	< 0.01 mg/kg

FSSI: Formal specimen size injected

All chromatograms are autoscaled for the corresponding analyte peak height. Y-scale maximum is given in counts per second (cps).

n/a: Peak not detected or below threshold for integration


TIC from 0699_47_04
4.96e3 cps
3.53
0.35
2.11
TIC from 0699_47_03
1.71e2 cps
3.36
2.13
TIC from 0699_47_05
4.71e3 cps
3.54
0.47
1.97
TIC from 0699_47_09
1.50e2 cps
3.37
1.67
0.32
TIC from 0699_46_04
4.93e3 cps
3.54
2.13
TIC from 0699_46_03
2.05e3 cps
1.66
3.52
TIC from 0699_46_05
5.06e3 cps
3.54
0.62
1.63
TIC from 0699_46_09
4.86e2 cps
1.62
3.55
Intensity, cps
Time, min

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This report contains weather data from first application to last specimen collection

Weather Station: 45480 Greneville en Beauce (precipitation)

28310 Poinville

Approximate distance from study plot: 3 km

DATA TABLE: Data originated from Meteo-France

Remarks to column Activity : A = Application, S = Specimen collection

Activity	Dates (YYYY/MM/DD)	Precipitation (mm)	Temperature (°C) min.	Temperature (°C) max.	Rel. humidity (%) min.	Rel. humidity (%) max.	Wind speed (m/s)
A	19980604	10.4	7.4	23.3	47	93	
	19980605	0.5	14.2	26.3	68	93	
	19980606	3.5	17.3	25.8	70	93	
	19980607	6	13.8	19.6	64	95	
	19980608	0	11.1	19.9	61	95	
	19980609	0	13.5	24.5	65	91	
	19980610	5	13.5	19.2	67	94	
	19980611	1.4	10.3	16.4	54	94	
	19980612	0	6.9	16.7	54	93	
	19980613	6.8	7.7	16	68	95	
	19980614	10.7	11.3	18.1	73	96	
	19980615	3.5	10.9	17.4	71	96	
	19980616	0	6.8	18.7	60	96	
	19980617	0	4.9	20.2	51	96	
	19980618	0	8.5	23.8	47	92	
	19980619	0	9.7	28.2	42	93	
	19980620	0	9.8	33.4	34	93	
	19980621	0	17.8	26.9	63	91	
	19980622	0	12	23	49	94	
	19980623	0	9	24.9	44	93	
	19980624	0.7	12.4	29.2	39	92	
	19980625	0	14.1	22.8	49	92	
	19980626	0	10.3	23	46	91	
	19980627	0.7	9.8	23.5	51	95	
	19980628	0	8.8	21.2	50	97	
	19980629	0	9.1	23.2	49	94	
	19980630	1.6	8.5	20.7	67	95	
	19980701	0	15.1	21.3	58	96	
	19980702	8.9	13.4	19.8	69	94	
	19980703	0	13.3	22.3	51	91	
	19980704	0	6.5	23.7	44	95	
	19980705	0	8.5	20.9	58	95	
	19980706	0	13.8	21.2	59	91	
	19980707	0	10.7	20.5	50	95	
	19980708	0	7.3	23.5	37	94	
	19980709	1.1	9.3	20.7	56	94	
	19980710	0	15.2	22.8	53	95	
	19980711	0	14.8	25	42	92	
	19980712	0	15.2	27.2	46	92	
	19980713	10.7	13.1	22	40	93	
		71.5	445.6	896.8	2166	3749	

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Activity	Dates (YYYY/MM/DD)	Precipitation (mm)	Temperature (°C) min.	Temperature (°C) max.	Rel. humidity (%) min.	Rel. humidity (%) max.	Wind speed (m/s)
	19980714	0	5.4	22.5	42	95	
	19980715	0	6.5	21	48	95	
	19980716	2.3	12.4	23.2	68	95	
	19980717	0	14.2	24.1	48	92	
	19980718	0	13.1	25.2	41	95	
	19980719	0	10.7	32.3	32	92	
	19980720	2.6	15	34	28	94	
	19980721	0	16	25	39	97	
	19980722	0	8.2	27	26	99	
	19980723	3	15	23	61	96	
	19980724	0	14	26	41	97	
	19980725	0	9	26	26	94	
	19980726	0	9	26	27	91	
	19980727	3.4	10.8	24.6	49	97	
	19980728	1.5	11	19	66	98	
	19980729	0.6	14.2	22.8	53	98	
	19980730	0	13	24	38	97	
	19980731	0	8	24.5	40	97	
	19980801	0.4	9.5	23.5	40	99	
	19980802	3.2	11	23	57	98	
	19980803	0	9	26	34	98	
	19980804	0	14	26	42	96	
	19980805	0	7.8	26.6	34	95	
	19980806	0	8.8	28.8	21	91	
	19980807	0	9.3	31.7	19	91	
	19980808	0	12	36.5	17	84	
	19980809	0	13.1	36.8	15	82	
	19980810	0	14.8	37.9	11	82	
	19980811	0	15.2	36.5	23	78	
	19980812	0	17.4	28.8	28	80	
	19980813	0	8.7	25.3	29	93	
	19980814	0	9.4	28.2	31	84	
	19980815	0	10.8	31	23	87	
	19980816	0	13.5	30.2	36	94	
	19980817	0	11.9	30.4	25	85	
S	19980818	0	10	26.4	48	93	
	19980819	0	14.2	27.5	39	87	
	19980820	0.9	10.8	26.6	26	88	
	19980821	1.9	14.2	22.2	67	94	
	19980822	3.2	13.6	19.5	79	95	
	19980823	5.7	7.9	24.1	42	97	
	19980824	0.3	13.9	22.7	53	95	
	19980825	0	7.3	23.9	39	95	
	19980826	0	7.2	24	43	93	
S	19980827	0	12.7	19.1	40	83	
	19980828	0	4.5	20	38	91	
	19980829	0	3.3	19.5	44	91	
	19980830	0	4.7	23.6	40	90	
	19980831	0	10	26	35	89	
	19980901	2.4	14.2	27.5	52	90	
		31.4	550.2	1310	1943	4607	

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Activity	Dates (YYYY/MM/DD)	Precipitation (mm)	Temperature (°C) min.	Temperature (°C) max.	Rel. humidity (%) min.	Rel. humidity (%) max.	Wind speed (m/s)
	19980902	2.4	17.5	25.3	68	91	
	19980903	0.7	15.6	21.1	59	93	
	19980904	8.8	8.3	19	81	96	
	19980905	0	13.1	21.4	65	97	
	19980906	1.2	10	24	53	96	
	19980907	8.3	14.8	22	59	94	
	19980908	2.5	13.4	19.7	85	94	
	19980909	0.3	16.8	22.3	67	95	
	19980910	3.4	15	23.4	52	92	
	19980911	10.7	12.2	17	74	95	
	19980912	4.8	9.1	16	67	94	
	19980913	2.7	6.1	13.9	72	93	
	19980914	2.4	7.4	15.3	75	92	
	19980915	4	7.2	16.6	87	96	
	19980916	0	11.2	18.1	57	96	
	19980917	0	9.5	18.8	51	95	
	19980918	0	3.9	21.3	46	94	
	19980919	0	7.3	21.2	48	89	
	19980920	0	8.8	21.9	51	92	
	19980921	0	10.1	21.1	44	87	
	19980922	0	9.2	20.2	47	88	
	19980923	0	8.5	25.5	38	93	
	19980924	0	9.8	23.7	49	92	
	19980925	0.6	10.7	23.9	49	94	
	19980926	8.3	12.8	19.1	80	95	
	19980927	9	12	15.9	89	95	
	19980928	4.1	13.1	18.5	87	96	
	19980929	5.6	11.1	17	89	97	
	19980930	0	13.7	18.7	64	94	
	19981001	0	10.7	16	72	92	
	19981002	0	10.9	16.4	76	94	
	19981003	0	7.1	10.1	63	93	
	19981004	0	6.5	12.4	65	93	
	19981005	0	8.1	13.2	74	94	
S	19981006	4.7	3.7	10.7	91	95	
		84.5	365.2	660.7	2294	3276	