

Test Material: Cyprodinil

MRID: 49570207

Title: Residue Analytical Method for the Determination of Cyprodinil and its Metabolites CGA249287, CGA275535 and CGA321915 in Soil

MRID: 49570206

Title: Cyprodinil - Independent Laboratory Validation of Residue Method (RAM425/01) for the Determination of Cyprodinil (CGA219417) and its Metabolites CGA249287, CGA275535 and CGA321915 in Soil by LC-MS/MS

EPA PC Code: 288202

OCSPP Guideline: 850.6100

For CDM Smith

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Date: 6/29/15

Analytical method for cyprodinil (CGA219417) and its transformation products CGA249287, CGA275535, and CGA321915 in soil

Reports: ECM: EPA MRID No. 49570207. Hadfield, S.T., and N.J. Robertson. 2004. Residue Analytical Method for the Determination of Cyprodinil and its Metabolites CGA249287, CGA275535 and CGA321915 in Soil. Report prepared by Syngenta, Jealott's Hill International Research Centre, Berkshire, United Kingdom, sponsored, and submitted by Syngenta Crop Protection, LLC, Greensboro, North Carolina; 37 pages. Syngenta Report No.: RAM425/01 and Task No.: TK0258345. Final report issued July 1, 2004. ILV: EPA MRID No. 49570206. Perez, R., S. Perez, and A. Ratliff. 2014. Cyprodinil - Independent Laboratory Validation of Residue Method (RAM425/01) for the Determination of Cyprodinil (CGA219417) and its Metabolites CGA249287, CGA275535 and CGA321915 in Soil by LC-MS/MS. Report prepared by ADPEN Laboratories, Inc., Jacksonville, Florida, sponsored and submitted by Syngenta Crop Protection, LLC, Greensboro, North Carolina; 177 pages. Report No.: 2K14-901-TK0233110-001, Study No.: 2K14-901-TK0233110, and Task No.: TK0233110. Final report issued October 3, 2014.

Document No.: MRIDs 49570207 & 49570206

Guideline: 850.6100

Statements: ECM: The study was not conducted in compliance with OECD Principles of Good Laboratory Practice (GLP; p. 3 of MRID 49570207). Signed and dated Data Confidentiality and GLP statements were provided (pp. 2-3). Quality Assurance and Authenticity Certification statements were not provided. ILV: The study was conducted in compliance with USEPA GLP standards (p. 3 of MRID 49570206). Signed and dated Data Confidentiality, GLP, and Quality Assurance statements were provided (pp. 2-4). The Quality Assurance statement specified that the quality assurance unit "inspected this study and the report to assure the integrity of the data", but does not specify that the study report provides a true and accurate record of the results obtained.

Classification: This analytical method is classified as **Acceptable**. An updated ECM report implementing the ILV confirmatory method should be prepared. The LOQ and LOD encompassed the toxicological level of concern for cyprodinil, but were determined via the method evaluation at the lowest spike level subjectively selected by the study investigators.

PC Code: 288202

Reviewer:

Gabe Rothman, EPA

Signature:



Date: November 1, 2016

For both MRIDs, page citations in this review refer to the bottommost set of page numbers located in the lower right corner of each page of the MRID.

Executive Summary

The analytical method, Syngenta Residue Method RAM425/01, is designed for the quantitative determination of cyprodinil (CGA219417) and its transformation products CGA249287, CGA275535, and CGA321915 in soil using LC/MS/MS. The method is quantitative for the analytes at the stated LOQ of 0.01 mg/kg (ppm). The LOQ is less than the lowest toxicological level of concern in soil. The independent laboratory validated the method for analysis of cyprodinil, CGA249287, CGA275535, and CGA321915 at the LOQ and 10x LOQ in clay loam and sandy loam soil matrices after one trial. No major modifications were made by the independent laboratory; however, an updated ECM report should be prepared implementing the confirmatory ion transitions as validated by the independent laboratory.

Table 1. Analytical Method Summary

Analyte(s) by Pesticide	MRID		EPA Review	Matrix	Method Date (dd/mm/yyyy)	Registrant	Analysis	Limit of Quantitation (LOQ)
	Environmental Chemistry Method	Independent Laboratory Validation						
Cyprodinil (CGA219417)	49570207	49570206		Soil ¹	01/07/2004	Syngenta	LC/MS/MS	0.01 mg/kg (ppm)
CGA249287								
CGA275535								
CGA321915								

¹ Characterized loamy sand and silty clay loam soils were used for the ECM validation, with clay loam and sandy loam soils used for the ILV (Appendix 3, Table 1, p. 21 of MRID 49570207; Appendix 4, pp. 149-150 of MRID 49570206).

I. Principle of the Method

Soil (10 g) was fortified with standard solutions of cyprodinil (CGA219417), CGA249287, CGA275535, and CGA321915 in methanol for procedural recoveries; it was not specified if mixed standard solutions were used (pp. 9-10 of MRID 49570207). Loamy sand/sandy loam (Pappelacker) and silty clay loam (Scheueracker) soils were used for the validation (Appendix 3, Tables 1-5, pp. 21-23). Soil samples (10 g) are reflux extracted with 100 mL of methanol:water (80:20, v:v) for 1 hour (p. 11). After cooling to room temperature, the extract is decanted and centrifuged (3,500 rpm, 5 minutes). The supernatant is decanted, brought to volume (100 mL) with methanol or methanol:water (80:20, v:v), and again centrifuged (3,500 rpm, 5 minutes) if cloudy. A 1-mL aliquot of the sample is combined with 0.7 mL of 10mM ammonium acetate, then the sample is concentrated to 1.0 mL under a stream of dry air in a heating block (40°C) to remove the methanol for LC/MS/MS analysis (pp. 8, 11).

Samples are analyzed using an Agilent 1100 HPLC system and an Applied Biosystems API 4000 triple quadrupole MS with TurboIonSpray interface (pp. 12-13 of MRID 49570207). The following LC conditions were used: Kromasil KR100 ODS column (3.2 mm x 50 mm, 5 µm, column temperature 40°C), mobile phase of (A) methanol and (B) 10mM ammonium acetate [percent A:B (v:v) at 0.0 min. 10:90, 2.0-2.9 min. 95:5, 3.0-4.0 min. 10:90], and injection volume of 20 µL. The following MS/MS conditions were used: positive ion mode and multiple reaction monitoring (MRM). Analytes are identified using single ion pair transitions. Ion transitions monitored were as follows: *m/z* 226.0→93.1 for cyprodinil (CGA219417), *m/z* 150.1→118.1 for CGA249287, *m/z* 241.9→93.1 for CGA275535, and *m/z* 151.0→93.1 for CGA321915. Expected retention times are

ca. 3.1, 2.3, 2.7, and 1.7 minutes for cyprodinil (CGA219417), CGA249287, CGA275535, and CGA321915, respectively (Figures 5-9, pp. 24-28).

ILV: Test compounds and two soil matrices (clay loam, sandy loam) were supplied by Syngenta (pp. 14-15 of MRID 49570206). The soil matrices were characterized, and source locations were Ohio (Underwood Farm, 0-6") for the clay loam soil and California (San Luis Obispo Farm, 0-6") for the sandy loam soil (p. 15; Appendix 4, pp. 149-150). The independent laboratory performed the extraction method as written (pp. 16-17; Appendix 1, p. 110). The following LC/MS/MS equipment and parameters were modified: an Agilent 1290 UPLC system, Agilent 6490 Series QQQ MS with Agilent Jet Stream electrospray ionization, and Zorbax SB-AQ column (4.6 mm x 50 mm, 1.8 μ m) were used (pp. 17-18). Analytes were identified using two ion pair transitions; one for quantitation (Q, "primary") and one for confirmation (C). Ion transitions monitored were as follows: m/z 226.1 \rightarrow 93.0 (Q) and m/z 226.1 \rightarrow 77.0 (C) for cyprodinil (CGA219417), m/z 150.1 \rightarrow 66.9 (Q) and m/z 150.1 \rightarrow 118.0 (C) for CGA249287, m/z 242.1 \rightarrow 93.0 (Q) and m/z 242.1 \rightarrow 64.9 (C) for CGA275535, and m/z 151.1 \rightarrow 93.0 (Q) and m/z 151.1 \rightarrow 108.0 (C) for CGA321915. Expected retention times are ca. 2.5, 2.0, 2.3 and 1.6 minutes for cyprodinil (CGA219417), CGA249287, CGA275535, and CGA321915, respectively.

LOQ and LOD: In the ECM and ILV, the LOQ for all analytes was 0.01 mg/kg (ppm; p. 16 of MRID 49570207; p. 20 of MRID 49570206). In the ECM and ILV, the LODs were estimated at 0.0005 mg/kg (ppm) for cyprodinil and 0.00025 mg/kg for CGA 249287, CGA275535, and CGA321915.

II. Recovery Findings

ECM (MRID 49570207): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD \leq 20%) for analysis of cyprodinil (CGA219417) and its transformation products CGA249287, CGA275535, and CGA321915 in loamy sand/sandy loam (Pappelacker) and silty clay loam (Scheueracker) soils at fortification levels of 0.01 mg/kg and 0.1 mg/kg (10x LOQ; Appendix 3, Tables 1-5, pp. 21-23 and DER Attachment 2). A confirmatory method was not used. Soil characterizations (pH, percent sand, silt, clay, and organic matter) were provided (Appendix 3, Table 1, p. 21). The Pappelacker soil was described as "Loamy Sand" in Table 1 (Appendix 3, p. 21), but as "Sandy Loam" in Tables 2-6 (Appendix 3, pp. 21-23) and the chromatograms (Appendix 4, Figures 6-7, pp. 25-26); the particle size scale, to determine which soil classification system was used, was not reported.

ILV (MRID 49570206): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD \leq 20%) for analysis of cyprodinil (CGA219417) and its transformation products CGA249287, CGA275535, and CGA321915 in clay loam and sandy loam soils at fortification levels of 0.01 mg/kg (ppm, LOQ) and 0.1 mg/kg (10x LOQ; p. 19; Tables 2-17, pp. 24-39). Analytes were identified and quantified using two ion transitions; quantitation ion and confirmation ion recovery results were comparable. The method was validated for both analytes at both fortification levels in the two soil matrices after one trial, with alternate LC/MS/MS parameters and additional confirmation MRM transitions (pp. 10, 14-16). The soil matrices were characterized by Agvise Laboratories, Northwood, North Dakota (Appendix 4, pp. 149-150).

Table 2. Initial Validation Method Recoveries for Cyprodinil (CGA219417) and Its Transformation Products CGA249287, CGA275535, and CGA321915 in Soil¹

Analyte	Fortification Level (mg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Loamy Sand/Sandy Loam Soil						
Cyprodinil	0.01 (LOQ)	5	90-104	97	6	6
	0.1	5	85-101	94	7	7
CGA249287	0.01 (LOQ)	5	85-97	91	5	6
	0.1	5	81-101	91	10	11
CGA275535	0.01 (LOQ)	5	83-98	89	8	9
	0.1	5	83-95	90	5	5
CGA321915	0.01 (LOQ)	5	89-102	96	6	6
	0.1	5	82-100	94	8	9
Silty Clay Loam Soil						
Cyprodinil	0.01 (LOQ)	5	80-86	84	2	3
	0.1	5	80-85	82	2	3
CGA249287	0.01 (LOQ)	5	99-111	103	5	5
	0.1	5	94-100	96	2	3
CGA275535	0.01 (LOQ)	5	80-90	84	4	5
	0.1	5	70-80	76	4	6
CGA321915	0.01 (LOQ)	5	96-110	100	6	6
	0.1	5	87-96	91	4	4

Data (recovery results) were obtained from Appendix 3, Tables 2-5, pp. 21-23 of MRID 49570207 and DER Attachment 2 (standard deviation). Example calculations did not include correction of recoveries for residues detected in matrix control samples (p. 14).

¹ Soil characterizations were provided, but source locations were not reported (Appendix 3, Table 1, p. 21). The Pappelacker soil was described as "Loamy Sand" in Table 1 (Appendix 3, p. 21), but as "Sandy Loam" in Tables 2-6 (Appendix 3, pp. 21-23) and the chromatograms (Appendix 4, Figures 6-7, pp. 25-26); the particle size scale, to determine which soil classification system was used, was not reported.

Table 3. Independent Validation Method Recoveries for Cyprodinil (CGA219417) and Its Transformation Products CGA249287, CGA275535, and CGA321915 in Soil¹

Analyte	Fortification Level (mg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Clay Loam Soil						
Quantitation Ion						
Cyprodinil	0.01 (LOQ)	5	77-82	79	2.0	2.5
	0.1	5	71-79	74	2.8	3.8
CGA249587	0.01 (LOQ)	5	73-79	76	2.1	2.8
	0.1	5	75-80	77	2.0	2.7
CGA275535	0.01 (LOQ)	5	71-82	79	4.7	6.1
	0.1	5	76-82	79	2.5	3.1
CGA321915	0.01 (LOQ)	5	72-84	79	4.5	5.7
	0.1	5	77-83	80	2.7	3.4
Confirmation Ion						
Cyprodinil	0.01 (LOQ)	5	74-78	76	1.4	1.8
	0.1	5	71-78	74	2.6	3.5
CGA249587	0.01 (LOQ)	5	77-85	81	3.0	3.7
	0.1	5	74-81	77	2.7	3.5
CGA275535	0.01 (LOQ)	5	73-83	78	4.0	5.1
	0.1	5	76-81	79	2.2	2.8
CGA321915	0.01 (LOQ)	5	79-86	82	2.6	3.2
	0.1	5	76-86	79	3.9	5.0
Sandy Loam Soil						
Quantitation Ion						
Cyprodinil	0.01 (LOQ)	5	75-80	77	2.5	3.2
	0.1	5	72-86	76	5.6	7.4
CGA249587	0.01 (LOQ)	5	77-82	79	2.1	2.7
	0.1	5	75-99	81	9.9	12.2
CGA275535	0.01 (LOQ)	5	71-79	74	3.5	4.8
	0.1	5	73-78	75	2.0	2.7
CGA321915	0.01 (LOQ)	5	76-80	78	1.9	2.4
	0.1	5	76-97	82	8.8	10.8
Confirmation Ion						
Cyprodinil	0.01 (LOQ)	5	70-73	71	1.3	1.8
	0.1	5	73-91	77	7.8	10.1
CGA249587	0.01 (LOQ)	5	76-84	79	3.4	4.3
	0.1	5	74-97	80	9.4	11.7
CGA275535	0.01 (LOQ)	5	70-76	73	2.6	3.5
	0.1	5	70-76	74	2.5	3.4
CGA321915	0.01 (LOQ)	5	72-79	76	2.9	3.9
	0.1	5	75-98	81	9.5	11.7

Data (recovery results, uncorrected except for CGA275535 confirmation ion recoveries for both soils) were obtained from Tables 2-17, pp. 24-39 of MRID 49570206.

¹ The clay loam (Ohio) and sandy loam (California) soil matrices, supplied by Syngenta, were characterized (pp. 14-15; Appendix 4, pp. 149-150).

III. Method Characteristics

In the ECM and ILV, the LOQ for cyprodinil (CGA219417) and its transformation products CGA249287, CGA275535, and CGA321915 in soil was 0.01 mg/kg (ppm), and the LODs were estimated at 0.0005 mg/kg for cyprodinil and 0.00025 mg/kg for CGA249287, CGA275535, and CGA321915 (pp. 8, 16 of MRID 49570207; pp. 11, 20 of MRID 49570206). The ECM defined the LOQ as the lowest analyte concentration at which the methodology has been validated and a mean recovery of 70-110% and RSD of $\leq 20\%$ has been obtained. The ECM defined the LOD as the lowest analyte concentration detectable above the mean amplitude of the background noise in an untreated matrix control sample at the corresponding retention time, and an estimate of the LOD can be taken as four times the background noise.

Table 4. Method Characteristics for Cyprodinil (CGA219417) and Its Transformation Products CGA249287, CGA275535, and CGA321915 in Soil

		Cyprodinil	CGA249287	CGA275535	CGA321915
Limit of Quantitation (LOQ)		0.01 mg/kg (ppm)			
Limit of Detection (LOD)		0.0005 mg/kg	0.00025 mg/kg		
Linearity (calibration curve r^2 and concentration range)	ECM: ¹	Q ion: $r^2 = 0.9997-0.9998$	Q ion: $r^2 = 0.9999$	Q ion: $r^2 = 0.9977-0.9984$	Q ion: $r^2 = 0.9973-0.9981$
	Range: 10-1,000 pg (0.0005-0.05 $\mu\text{g/mL}$, with 20 μL injection)				
	ILV: ²	Q ion: $r^2 = 0.9997-0.9998$ C ion: $r^2 = 0.9984-0.9991$	Q ion: $r^2 = 0.9994-0.9998$ C ion: $r^2 = 0.9996-0.9998$	Q ion: $r^2 = 0.9992-0.9995$ C ion: $r^2 = 0.9989-0.9997$	Q ion: $r^2 = 0.9968-0.9985$ C ion: $r^2 = 0.9978-0.9987$
		Range: 0.00250-0.50000 ng (0.25-50.0 ng/mL)			
Repeatable	ECM:	Yes at LOQ and 10x LOQ.			
	ILV:	Yes at LOQ and 10x LOQ.			
Reproducible		Yes.			
Specific	ECM:	Interferences (based on peak height) were $\leq 11\%$ of LOQ at analyte retention time in matrix controls (Appendix 4, Figures 6-9, pp. 25-28 of MRID 49570207).			
		A confirmatory method was not used.			
		Matrices were a loamy sand/sandy loam soil and a silty clay loam soil. ³			
		Matrix effects for the two soil matrices were $\pm 0.4-15.4\%$ and were considered acceptable (Appendix 3, Table 6, p. 23).			
	ILV:	No interferences (based on ppm found) detected at analyte retention time for the Q ion in reagent blank and matrix controls. For C ion, a peak prior to cyprodinil retention time interfered with analyte peak at lower calibrant standards and at LOQ (Tables 2-3, pp. 24-25; Tables 10-11, pp. 32-33; Figure 5, pp. 45-52; Figures 9-11, pp. 77-79; Figures 25-27, pp. 93-95 of MRID 49570206).	No interferences (based on ppm found) detected at analyte retention time for the Q and C ions in reagent blank and matrix controls, except for clay loam C ion (92% of LOD, 2.3% of LOQ; Tables 4-5, pp. 26-27; Tables 12-13, pp. 34-35; Figures 13-14, pp. 81-82; Figures 29-30, pp. 97-98).	Interferences (based on ppm found) detected at analyte retention time for the Q and C ions were $< 20\%$ of LOD in reagent blank and matrix controls (Tables 6-7, pp. 28-29; Tables 14-15, pp. 36-37; Figures 17-18, pp. 85-86; Figures 33-34, pp. 101-102).	No interferences (based on ppm found) detected at analyte retention time for the Q and C ions in reagent blank and matrix controls (Tables 8-9, pp. 30-31; Tables 16-17, pp. 38-39; Figures 21-22, pp. 89-90; Figures 37-38, pp. 105-106).
		Matrices were a clay loam soil and a sandy loam soil. ⁴			

Data were obtained from pp. 8, 16; Appendix 3, Tables 1-6, pp. 21-23; Appendix 4, Figures 6-9, pp. 25-28; Appendix 5, Figure 10, pp. 29-32 of MRID 49570207; pp. 11, 19-20; Tables 2-17, pp. 24-39; Figures 1-5, pp. 41-52; Figures 9-11, pp. 77-79; Figures 13-14, pp. 81-82; Figures 17-18, pp. 85-86; Figures 21-22, pp. 89-90; Figures 25-27, pp. 93-95; Figures 29-30, pp. 97-98; Figures 33-34, pp. 101-102; Figures 37-38, pp. 105-106 of MRID 49570206, and DER Attachment 2.

Linearity is satisfactory when $r^2 \geq 0.995$.

¹ Calibration standard curves plotted with intercept set to zero and with no intercept set (p. 16; Appendix 5, Figure 10, pp. 29-32 of MRID 49570207).

² 1/x weighting (Appendix 6, pp. 153-176 of MRID 49570206). Although linearity values were identified as "Corr (r)" in the Analyte Residue Reports (Appendix 6, pp. 153-176), the study report text and plotted calibration curves indicate coefficient of determination (r^2) values were reported (p. 18; Figures 1-4, pp. 41-44).

- 3 Soil characterizations were provided, but source locations were not reported (Appendix 3, Table 1, p. 21 of MRID 49570207). The Pappelacker soil was described as "Loamy Sand" in Table 1 (Appendix 3, p. 21), but as "Sandy Loam" in Tables 2-6 (Appendix 3, pp. 21-23) and the chromatograms (Appendix 4, Figures 6-7, pp. 25-26); the particle size scale, to determine which soil classification system was used, was not reported.
- 4 Characterizations were provided for the clay loam (Ohio) and sandy loam (California) soil matrices (Appendix 4, pp. 149-150 of MRID 49570206).

IV. Method Deficiencies and Reviewer's Comments

1. The current ECM does not include a confirmatory method. Typically, a confirmatory method is not required where GC/MS and LC/MS methods are used as the primary method. However, the independent laboratory included confirmatory ion transitions in the ILV of the ECM. While, the equipment substitutions and method modifications implemented by the independent laboratory (see section **I. Principle of the Method, ILV**; above for details) are not considered substantial changes to the ECM, an updated ECM report implementing the additional confirmatory ion transitions should be prepared.
2. The LOQ and LOD encompassed the toxicological level of concern for cyprodinil, but were determined via the method evaluation at the lowest spike level subjectively selected by the study investigators. This is inconsistent with objective procedures as defined in 40 CFR Part 136, Appendix B. The ECM defined the LOQ as the lowest analyte concentration at which the methodology has been validated and a mean recovery of 70-110% and RSD of $\leq 20\%$ has been obtained (p. 16 of MRID 49570207). The ECM defined the LOD as the lowest analyte concentration detectable above the mean amplitude of the background noise in an untreated matrix control sample at the corresponding retention time and an estimate of the LOD can be taken as four times the background noise. Detection limits should not be based on the arbitrarily selected lowest concentration in the spiked samples. Additionally, the lowest toxicological level of concern in soil was not reported. A LOQ above toxicological levels of concern results in an unacceptable method classification.
3. For the ILV, recovery results were corrected when residues were found in the matrix control samples, but this only applied to CGA275535 C ion/clay loam and sandy loam recovery results (Tables 2-17, pp. 24-39 of MRID 49570206).

It could not be determined if recovery results were corrected for the ECM validation because insufficient information was provided. Example calculations did not include correction of recoveries for residues detected in matrix control samples (p. 14 of MRID 49570207).

4. For the ILV, the chromatograms for cyprodinil C ion show a peak prior to the cyprodinil retention time interfering with the analyte peak for lower calibrant standards and at the LOQ (Figure 5, pp. 45-52; Figures 9-11, pp. 77-79; Figures 25-27, pp. 93-95 of MRID 49570206).

Additionally, the chromatogram for CGA249287 C ion/clay loam soil showed interferences of 92% of LOD (2.3% of LOQ, based on ppm found) in the method blank, but no interferences were detected in matrix control samples (Table 5, p. 27; Figures 13-14, pp. 81-82 of MRID 49570206).

5. For the ILV, although linearity values were identified as "Corr (r)" in the Analyte Residue Reports (Appendix 6, pp. 153-176 of MRID 49570206), the study report text and plotted

- calibration curves indicate coefficient of determination (r^2) values were reported (p. 18; Figures 1-4, pp. 41-44).
6. For the ECM validation, chromatograms for reagent blank and 10x LOQ spiked samples were not provided (Appendix 4, Figures 6-9, pp. 25-28 of MRID 49570207). For the calibration standards, only chromatograms of a 0.01 $\mu\text{g/mL}$ standard were provided (calibration standard range 0.0005-0.05 $\mu\text{g/mL}$; p. 16; Appendix 4, Figure 5, p. 24). Standard curve plots with regression curve analyses were provided, but the individual calibration standard data were not provided (Appendix 5, Figure 10, pp. 29-32).
 7. All communications prior to running the samples between the independent laboratory and the developers or previous users of the ECM were not provided. The independent laboratory provided "all pertinent communications" (p. 20; Appendix 7, p. 177 of MRID 49570206).
 8. For the ECM validation, the Pappelacker soil was described as "Loamy Sand" in Table 1 (Appendix 3, p. 21 of MRID 49570207), but as "Sandy Loam" in Tables 2-6 (Appendix 3, pp. 21-23) and the chromatograms (Appendix 4, Figures 6-7, pp. 25-26). The particle size scale, to determine which soil classification system was used, was not reported.
 9. For the ECM validation, the purities of the test compounds used were not reported, only described as "analytical standard" (pp. 7-9 of MRID 49570207).
 10. For the ILV, a typographical error was noted in Table 6 (p. 28 of MRID 49570206), the "Range of Recoveries" was reported as 77-82%, but should read 76-82%. Another typographical error was noted in the results table on p. 19, where the mean recovery for the LOQ (Q ion) of CGA275535 in clay loam was reported as 78%, but should read 79%.

For the ECM, a typographical error was noted in Table 6 (Appendix 3, p. 23 of MRID 49570207), the sentence "The effect of the water matrices...", should read "The effect of the soil matrices..."
 11. It was reported for the ILV that a single analyst could complete a set of thirteen samples (one reagent blank, two matrix controls, and ten fortified samples) in less than three hours with LC/MS/MS analysis performed overnight (p. 20 of MRID 49570206).

V. References

- U.S. Environmental Protection Agency. 2012. Ecological Effects Test Guidelines, OCSPP 850.6100, Environmental Chemistry Methods and Associated Independent Laboratory Validation. Office of Chemical Safety and Pollution Prevention, Washington, DC. EPA 712-C-001.
- 40 CFR Part 136. Appendix B. Definition and Procedure for the Determination of the Method Detection Limit-Revision 1.11, pp. 317-319.

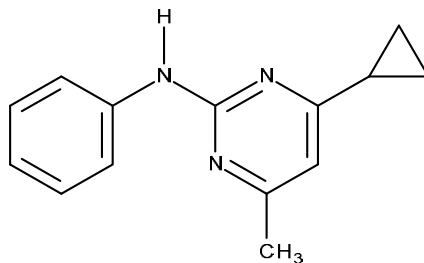
Attachment 1: Chemical Names and Structures**Cyprodinil (CGA219417)**

IUPAC Name: 4-Cyclopropyl-6-methyl-N-phenylpyrimidin-2-amine.
(4-Cyclopropyl-6-methyl-pyrimidin-2-yl)-phenyl-amine.
N-(4-Cyclopropyl-6-methyl-pyrimidin-2-yl)-aniline.

CAS Name: 4-Cyclopropyl-6-methyl-N-phenyl-2-pyrimidinamine.

CAS Number: 121552-61-2

SMILES String: c1ccccc1Nc2nc(C3CC3)cc(C)n2

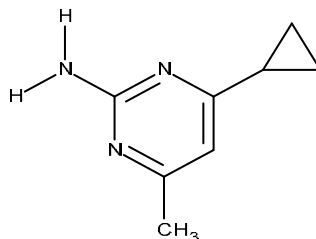
**CGA249287**

IUPAC Name: 4-Cyclopropyl-6-methyl-pyrimidin-2-ylamine.
4-Cyclopropyl-6-methyl-pyridin-2-ylamine.

CAS Name: Not available.

CAS Number: 92238-61-4

SMILES String: Cc1cc(nc(n1)N)C2CC2



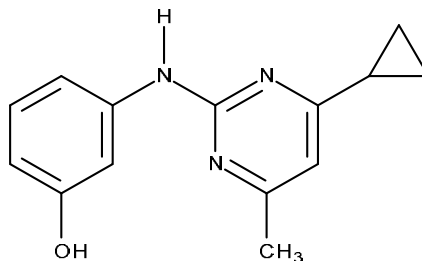
CGA275535

IUPAC Name: 3-[(4-Cyclopropyl-6-methyl-pyrimidin-2-yl)amino]phenol.
N-(4-Cyclopropyl-6-methyl-pyrimidin-2-yl)-3-hydroxy-aniline.

CAS Name: Not available.

CAS Number: Not available.

SMILES String: Cc1cc(nc(n1)Nc2cccc(c2)O)C3CC3

**CGA321915**

IUPAC Name: 4-Cyclopropyl-6-methyl-pyrimidin-2-ol.

CAS Name: Not available.

CAS Number: 1221553-48-8

SMILES String: Cc1cc(nc(n1)O)C2CC2

