RESIDUES AND TRACE ELEMENTS

Determination of Residues of 446 Pesticides in Fruits and Vegetables by Three-Cartridge Solid-Phase Extraction–Gas Chromatography-Mass Spectrometry and Liquid Chromatography-Tandem Mass Spectrometry

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A method was developed for determination of residues of 446 pesticides in fruits and vegetables through the use of cleanup by a 3-cartridge solid-phase extraction–gas chromatography/ mass spectrometry (GC/MS) and liquid chromatography/tandem mass spectrometry (LC/MS/MS). Fruit and vegetable samples (20 g) were extracted with 40 mL acetonitrile, salted out, and centrifuged. Half of the supernatant was passed into an Envi-18 cartridge, eluted with acetonitrile, and cleaned up with Envi-Carb and aminopropyl Sep-Pak cartridges in series after concentration of the eluates. Pesticides were eluted with acetonitrile–toluene (3 + 1, v/v), and eluates were concentrated to 0.5 mL and then added into internal standards after solvent exchange with 2 mL hexane and used for determination of 383 pesticides by GC/MS. The other half of the supernatant was concentrated to 1 mL and cleaned up with Envi-Carb and aminopropyl Sep-Pak cartridges in series. Pesticides were eluted with acetonitrile–toluene (3 + 1, v/v), and the eluates were concentrated to 0.5 mL, dried with nitrogen gas, diluted to 1.0 mL with acetonitrile–water (3 + 2, v/v), and used for determination of 63 pesticides by LC/MS/MS. The limit of detection for the method was 0.2–600 ng/g depending on the individual pesticide. In the method, fortification recovery tests at high, medium, and low levels were conducted on 6 varieties of fruits and vegetables, i.e., apples, oranges, grapes, cabbage, tomatoes, and celery, with average recoveries falling within the range of 55.0–133.8% for 446 pesticides, among which average recoveries between 60.0–120.0% accounted for 99% of the results. The relative standard deviation was between 2.1–39.1%, of which a relative standard deviation of 2.1–25.0% made up 96% of the results. Experiments proved that the method was applicable for determination of residues of 446 pesticides in fruit and vegetables.

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Food safety and hygiene, which is closely related to the health of human beings and their survival and development, is an important issue causing great concern by governments of different countries and the relevant international organizations. The World Health Organization (WHO) puts food safety in the top agenda of global public hygiene, among which pesticide and veterinary drug residues in foodstuffs pose potential hazards to food safety. For the purpose of ensuring food safety, the Food and Agriculture Organization (FAO)/WHO/Codex Alimentarius Commission (CAC) prescribes the maximum residue limit (MRL) for more than 170 pesticide and veterinary drug residues in over 300 varieties of agricultural products and foods. The United States, Canada, Germany, and other European Union (EU) nations, as well as regional international organizations promulgate their own MRLs of pesticides and veterinary drugs for various kinds of agricultural products and foods based on the actual conditions of their individual countries or localities. Currently, CAC lists 2572 pesticide residue limits, EU 22 289, U.S. 8669, and Japan 9052. Therefore, researchers from different countries have established methods for determination of multipesticide residues. In the last 20 years in particular, multiresidue analytical methods have been increasingly studied by researchers. A comparative study was conducted on more than 20 representative multiresidue methods applied to agricultural products, such as fruits and vegetables, and the extraction systems for the contemporary multiresidue methods were categorized by the solvents acetone, ethyl acetate, and acetonitrile.

One of the most widespread acetone extraction procedures was proposed by Luke et al. (1, 2). For this method, acetone was used for extraction, liquid–liquid partitioning was done with dichloromethane–petroleum ether, and cleanup was with Florisil. Gas chromatography with an electron capture detector (GC–ECD) was adopted for detection of

Table 1. Monitoring program of selected ions for A, B, C, and D groups of pesticide by GC/MS

Segment	Start time, min	Monitored ions, *m/z*	Dwell time, ms
		SIM[a] program for A group of pesticides	
1	8.30	138, 158, 173	200
2	9.60	124, 140, 166, 172, 183, 211	90
3	10.50	121, 154, 234	200
4	10.75	120, 137, 179	200
5	11.70	154, 186, 215	200
6	14.40	167, 168, 169	200
7	14.90	121, 142, 143, 153, 183, 195, 196, 198, 230, 231, 260, 276, 292, 316	30
8	16.20	88, 125, 246	200
9	16.70	137, 138, 145, 172, 174, 179, 187, 202, 204, 205, 237, 246, 249, 295, 304	30
10	17.80	138, 173, 175, 181, 186, 194, 196, 201, 210, 225, 236, 255, 277, 292	230
11	18.80	150, 165, 173, 175, 222, 223, 251, 255, 279	50
12	19.20	125, 143, 229, 261, 263, 265, 293, 305, 307, 329	50
13	19.80	125, 261, 263, 265, 285, 287, 293, 305, 307, 329	50
14	20.10	170, 181, 184, 198, 200, 206, 212, 217, 219, 226, 227, 233, 234, 241, 246, 249, 254, 258, 263, 264, 266, 268, 285, 286, 314	10
15	21.40	143, 152, 153, 158, 169, 173, 180, 181, 208, 217, 219, 220, 247, 254, 256, 260, 275, 277, 278, 351, 353, 355	10
16	22.30	61, 143, 160, 162, 181, 186, 208, 210, 220, 235, 248, 252, 263, 268, 270, 291, 351, 353, 355	20
17	23.00	133, 143, 146, 157, 209, 211, 246, 268, 270, 274, 298, 303, 320, 357, 359, 373, 375, 377	20
18	23.70	72, 104, 133, 145, 152, 157, 160, 162, 209, 211, 215, 253, 255, 260, 263, 267, 274, 277, 283, 285, 297, 302, 309, 345, 380	10
19	24.80	128, 145, 154, 157, 171, 175, 198, 217, 225, 240, 255, 258, 271, 283, 285, 288, 302, 303	20
20	25.50	154, 185, 217, 252, 253, 254, 288, 303, 319, 324, 334	50
21	26.00	87, 139, 143, 145, 165, 173, 199, 208, 231, 235, 237, 251, 253, 273, 316, 323, 384	20
22	26.80	145, 150, 156, 165, 173, 179, 199, 231, 235, 237, 245, 247, 280, 288, 322, 323, 384	20
23	27.90	165, 166, 173, 181, 253, 259, 261, 281, 292, 293, 308, 342	40
24	28.60	118, 160, 165, 166, 181, 203, 212, 227, 228, 231, 235, 237, 272, 274, 314, 323	30
25	29.30	135, 163, 164, 212, 227, 228, 232, 233, 250, 252, 278	40
26	30.00	102, 145, 159, 160, 161, 188, 199, 227, 303, 317, 340, 356	40
27	31.00	175, 183, 184, 220, 221, 223, 232, 250, 255, 267, 373	40
28	33.00	127, 180, 181	200
29	34.40	167, 181, 225, 419	150
30	35.70	172, 174, 181	200
		SIM program for B group of pesticides	
1	7.80	128, 132, 189	200
2	8.80	146, 156, 217	200
3	9.70	128, 136, 161, 171, 173, 203	90
4	10.70	127, 164, 192, 194, 196, 198	90
5	11.70	191, 193, 206	200
6	13.40	124, 203, 215, 250, 261	100
7	14.40	158, 168, 200, 242, 282, 284, 286	80
8	14.70	116, 120, 128, 148, 153, 171, 176, 188, 202, 211, 213, 234, 236, 238, 264, 266, 282, 284, 286, 306, 322, 335	10
9	16.00	116, 148, 183, 188, 219, 221, 254	80
10	16.80	153, 186, 231, 288	150
11	17.10	153, 160, 164, 169, 172, 173, 176, 197, 206, 210, 214, 223, 225, 229, 270, 318, 330, 347	20
12	18.20	61, 126, 160, 173, 176, 206, 214, 229	60
13	18.70	126, 127, 134, 148, 164, 171, 172, 180, 192, 197, 198, 210, 213, 223, 243, 286, 288, 305, 307	20
14	19.90	134, 171, 188, 197, 198, 210, 213, 237, 269, 276, 290, 305	40
15	20.60	100, 185, 211, 226, 241, 253, 257, 259, 378	50
16	21.20	73, 139, 141, 153, 161, 162, 167, 185, 191, 207, 213, 224, 226, 237, 238, 240, 250, 251, 286, 304, 318, 329, 331, 333, 351, 353, 355, 387	10
17	22.00	161, 167, 207, 222, 224, 226, 238, 264, 280, 286, 351, 353, 355	40
18	22.70	161, 163, 170, 171, 182, 185, 205, 213, 217, 241, 255, 256, 265, 267, 269, 276, 323, 339	20

Table 1. (*continued*)

Segment	Start time, min	Monitored ions, *m/z*	Dwell time, ms
19	23.40	137, 160, 176, 188, 238, 240, 246, 248, 259, 267, 269, 316, 318, 323, 331, 373, 375, 377	20
20	23.90	61, 160, 166, 176, 188, 193, 194, 246, 248, 250, 259, 292, 294, 297, 316, 318, 329, 331, 333, 339, 374, 377, 379	20
21	24.90	61, 105, 165, 167, 172, 175, 177, 187, 199, 214, 231, 235, 236, 237, 238, 256, 263, 292, 294, 297, 302, 305, 311, 313, 317, 339, 345, 374	10
22	25.60	77, 105, 139, 141, 165, 169, 171, 199, 202, 213, 223, 235, 237, 251, 252, 253, 256, 271, 276, 283, 297, 300, 325, 360, 361	10
23	26.70	105, 157, 165, 195, 199, 235, 237, 246, 276, 297, 325, 339, 342, 360, 363	30
24	27.60	148, 157, 161, 169, 172, 173, 201, 206, 257, 303, 310, 325	40
25	28.90	89, 99, 126, 127, 157, 161, 169, 172, 181, 183, 257, 260, 265, 272, 292, 303, 339, 341, 349, 365, 387, 389	10
26	29.80	79, 181, 183, 265, 311, 349	90
27	30.00	128, 157, 169, 171, 189, 252, 310, 323, 341, 375, 377, 379	40
28	31.20	132, 139, 154, 160, 161, 182, 189, 251, 310, 330, 341, 367	40
29	32.90	180, 199, 206, 226, 266, 308, 334, 362, 364	50
30	34.00	181, 250, 252	200
		SIM program for C group of pesticides	
1	7.30	109, 185, 220	200
2	8.70	152, 153, 154	200
3	9.30	58, 128, 129, 146, 188, 203	90
4	11.20	126, 161, 163	200
5	11.75	125, 126, 141, 158, 169, 170, 187, 208, 240	50
6	13.50	122, 123, 124, 151, 215, 250	90
7	14.70	107, 121, 150, 264, 276, 292	90
8	16.00	174, 202, 217	200
9	16.50	126, 141, 143, 156, 168, 176, 198, 199, 200, 210, 225, 268, 270, 277, 279	30
10	17.60	88, 173, 183, 186, 200, 215, 219, 254, 274	50
11	18.40	104, 130, 159, 161, 204, 237, 246, 257, 272, 285, 288, 313, 337	40
12	18.90	128, 129, 161, 163, 165, 175, 204, 217, 242, 246, 257, 264, 285, 288, 303, 306, 313, 326, 335	20
13	19.80	73, 89, 146, 162, 185, 212, 223, 227, 250, 265, 267	50
14	20.30	61, 144, 146, 162, 170, 185, 198, 199, 212, 213, 223, 227, 258	40
15	20.70	61, 103, 118, 144, 170, 181, 198, 199, 210, 217, 219, 222, 240, 254, 255	30
16	21.35	108, 117, 151, 160, 161, 170, 219, 221, 224, 225, 257, 267, 351, 353, 355	30
17	22.20	107, 108, 119, 123, 136, 145, 176, 219, 221, 246, 248, 263, 318, 351, 353, 355	20
18	22.70	77, 141, 165, 167, 174, 176, 206, 234, 239, 246, 248, 267, 268, 297, 299, 318	20
19	23.20	105, 123, 134, 161, 248, 250, 267, 297, 299	50
20	23.50	131, 143, 157, 161, 171, 220, 248, 250, 262, 296, 304, 329, 336, 338, 404	30
21	24.30	112, 130, 162, 168, 238, 262	90
22	25.10	112, 116, 130, 131, 162, 168, 206, 233, 234, 235, 238, 262	40
23	25.30	254, 282, 321, 323, 356, 383	90
24	26.00	131, 152, 206, 233, 234, 236, 251, 253, 315	50
25	26.90	149, 162, 176, 177, 190, 232, 268, 270, 328	50
26	27.90	105, 119, 120, 135, 140, 173, 266, 267, 269, 350, 394	50
27	28.80	105, 117, 123, 140, 145, 160, 183, 266, 267, 350, 394	50
28	29.00	117, 123, 127, 145, 154, 160, 183, 248, 350	50
29	29.60	116, 178, 186, 191, 219, 255	90
30	30.30	132, 162, 178, 184, 219, 226, 281, 293, 334	50
31	31.10	120, 136, 141, 147, 181, 183, 184, 192, 197, 247, 255, 289, 309, 364	30
32	32.00	112, 141, 147, 170, 183, 184, 255, 309, 364, 428, 447, 449	40
33	32.60	112, 141, 163, 170, 183, 376, 428, 447, 449	50
34	33.10	163, 165, 178, 181, 251, 279	90
35	33.80	157, 199, 451	200
36	34.70	181, 225, 250, 252, 419	100
37	35.40	259, 265, 287, 323, 325, 354	90
38	36.40	308, 318, 423	200

Table 1. (*continued*)

Segment	Start time, min	Monitored ions, *m/z*	Dwell time, ms
		SIM program for D group of pesticides	
1	5.50	110, 153, 154	200
2	8.00	153, 184, 212	200
3	11.00	139, 155, 211, 215, 250, 252	90
4	13.00	142, 156, 165, 171, 196, 197, 200, 201, 202	50
5	14.00	143, 155, 158, 167, 192, 203, 211, 220, 229, 231, 246	40
6	15.00	106, 142, 190, 237, 265, 280	90
7	16.00	108, 136, 145, 158, 164, 171, 173, 182, 186, 196, 197, 201, 211, 216, 213, 288	20
8	17.20	161, 174, 177, 197, 200, 202, 214, 229, 246, 357, 359, 394	40
9	17.90	89, 114, 128, 172, 173, 174, 175, 186, 189, 198, 223, 229, 230, 231, 233, 253, 256, 258, 263, 265, 268, 277, 282, 292, 297	10
10	19.20	142, 143, 154, 157, 162, 184, 185, 199, 200, 201, 202, 203, 214, 220, 229, 230, 247, 251, 252, 255, 263, 264, 270, 278, 285, 287, 292	10
11	20.00	153, 180, 197, 199, 200, 201, 202, 230, 239, 247, 251, 252, 266, 305, 308, 311, 343, 375, 380, 412	15
12	21.00	115, 184, 193, 195, 196, 198, 215, 221, 225, 250, 252, 263, 269, 276, 285, 297, 301, 332	20
13	21.60	128, 170, 194, 195, 210, 212, 224, 225, 236, 254, 279, 294	40
14	22.10	129, 155, 182, 184, 200, 201, 210, 212, 216, 224, 225, 229, 230, 254, 262, 263, 291, 300, 314, 326, 351, 353, 355	10
15	23.00	136, 171, 199, 215, 230, 251, 253, 266, 289, 407, 409, 411	40
16	23.90	130, 148, 178, 187, 202, 211, 223, 224, 226, 240, 258, 267, 295, 299, 311, 313, 323	20
17	25.00	129, 130, 145, 148, 164, 168, 184, 185, 196, 201, 218, 219, 227, 254, 259, 290, 299, 326, 330, 340, 360	15
18	26.00	156, 159, 184, 185, 213, 218, 227, 229, 270, 272, 290, 360	40
19	27.10	143, 160, 171, 206, 222, 223, 224, 230, 238, 251, 266, 294, 312, 338, 349	30
20	28.00	136, 174, 186, 202, 215, 231, 233, 237, 254, 278, 279, 294, 310, 311, 326, 366, 379	20
21	29.00	136, 153, 192, 194, 220, 234, 276, 318, 324, 333, 359, 394	40
22	30.00	160, 161, 171, 173, 175, 214, 317, 375, 377	50
23	30.80	173, 175, 196, 213, 230, 274, 292, 300, 304, 316, 319, 320, 335, 373	30
24	32.40	147, 236, 238, 340, 341, 342	90
25	34.00	125, 129, 198	200

[a] SIM = Selected ion monitoring.

organochlorine, organonitrogen, and organosulfur pesticides, and organophosphorus pesticides were determined by GC with a flame photometric detector (GC–FPD); 79 pesticide residues were determined by the method of Luke et al. Stan and Linkerhagner (3, 4) extracted with acetone before liquid–liquid partitioning with dichloromethane and cleaning up with gel permeation chromatography (GPC). GC with an atomic emission detector (GC–AED) was used for determining 385 pesticides. Then, extraction switched to acetone with liquid–liquid partitioning by ethyl acetate–cyclohexane and cleanup by GPC. Three kinds of GC detectors [ECD, nitrogen–phosphorous detector (NPD), and mass selective detector (MSD)] were used for detection of more than 400 pesticides. Gamon et al. (5) extracted with acetone, liquid–liquid partitioning was done with dichloromethane–petroleum ether, and determination was by GC with tandem mass spectrometry (GC/MS/MS) with an electron impact (EI) or chemical ionization (CI) source for detection of residues of 80 organophosphorus, organochlorine, organonitrogen, and pyrethroids pesticides. Gelsomino et al. (6) used extraction with acetone, liquid–liquid partitioning with dichloromethane, and cleaned up with GPC for determination of 77 pesticides by GC–ECD and confirmation by GC/MS. Podhorniak et al. (7), Koinecke et al. (8), and Specht et al. (9) extracted with the same system, or changed either the partitioning solvent or cleanup modes, and established multiresidue methods using GC with multiple detectors.

Ethyl acetate is also a popular multiresidue extraction solvent. Krijgsmann et al. (10) extracted pesticides with ethyl acetate, separated them on a glass capillary GC column, and determined 59 organophosphorus pesticides with FPD. Later on, Stan and Goebel (11) also adopted this extraction and cleanup system and determined 83 organophosphorus and organochlorine pesticides using the NPD and ECD. Holstege et al. (12) extracte with ethyl acetate, cleaned up via GPC or solid-phase extraction (SPE), and used GC and liquid chromatography (LC) for determination of 43 organophosphorus, 17 organochlorine, and 11 *N*-methyl carbamate pesticides. This method is applicable to fruits, vegetables, and animal tissues. Obana et al. (13, 14) used GPC with an activated carbon cartridge for cleanup and determined 110 pesticide residues in fruits and vegetables using GC–MSD and GC–FPD as well as LC with a fluorescence detector. Aguera et al. (15) used the same method without cleanup and determined residues of 55 organophosphorus, organochlorine,

Table 2. Parameters for simultaneous determination of 446 pesticide residues in fuits and vegetables by GC/MS and LC/MS/MS

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
ISTD		Heptachlor-epoxide	22.10	353(100)	355(79)	351(52)						
1	A	Allidochlor	8.78	138(100)	158(10)	173(15)		0.1250 ~ 5.000	$Y = 4.83 \times 10^5X - 5.48 \times 10^4$	0.9986	0.0125	0.0250
2	A	Dichlormid	9.74	172(100)	166(41)	124(79)		0.0063 ~ 2.500	$Y = 3.26 \times 10^7X + 1.03 \times 10^6$	0.9981	0.0063	0.0125
3	A	Etridiazol	10.42	211(100)	183(73)	140(19)		0.1875 ~ 7.500	$Y = 8.12 \times 10^5X - 2.65 \times 10^5$	0.9945	0.0188	0.0375
4	A	Chlormephos	10.53	121(100)	234(70)	154(70)		0.1250 ~ 5.000	$Y = 1.19 \times 10^6X + 1.14 \times 10^5$	0.9928	0.0125	0.0250
5	A	Propham	11.36	179(100)	137(66)	120(51)		0.0625 ~ 2.500	$Y = 1.01 \times 10^6X - 5.76 \times 10^4$	0.9975	0.0063	0.0125
6	A	Cycloate	13.56	154(100)	186(5)	215(12)		0.0625 ~ 2.500	$Y = 2.26 \times 10^6X - 1.16 \times 10^5$	0.9986	0.0063	0.0125
7	A	Diphenylamine	14.55	169(100)	168(58)	167(29)		0.0625 ~ 2.500	$Y = 5.81 \times 10^6X - 3.97 \times 10^5$	0.9975	0.0063	0.0125
8	A	Chlordimeform	14.93	196(100)	198(30)	195(18)	183(23)	0.1250 ~ 2.500	$Y = 3.39 \times 10^5X - 4.28 \times 10^4$	0.9966	0.0125	0.0250
9	A	Ethalfluralin	15.00	276(100)	316(81)	292(42)		0.2500 ~ 10.00	$Y = 5.28 \times 10^5X - 2.60 \times 10^5$	0.9926	0.0250	0.0500
10	A	Phorate	15.46	260(100)	121(160)	231(56)	153(3)	0.0625 ~ 2.500	$Y = 5.32 \times 10^5X - 4.50 \times 10^4$	0.9969	0.0063	0.0125
11	A	Thiometon	16.20	88(100)	125(55)	246(9)		0.0625 ~ 2.500	$Y = 3.00 \times 10^6X - 2.40 \times 10^5$	0.9967	0.0063	0.0125
12	A	Quintozene	16.75	295(100)	237(159)	249(114)		0.1250 ~ 5.000	$Y = 2.98 \times 10^5X - 5.32 \times 10^4$	0.9958	0.0125	0.0250
13	A	Atrazine-desethyl	16.76	172(100)	187(32)	145(17)		0.0625 ~ 2.500	$Y = 2.26 \times 10^6X - 1.93 \times 10^5$	0.9956	0.0063	0.0125
14	A	Clomazone	17.00	204(100)	138(4)	205(13)		0.0625 ~ 2.500	$Y = 3.04 \times 10^6X - 2.30 \times 10^5$	0.9976	0.0063	0.0125
15	A	Diazinon	17.14	304(100)	179(192)	137(172)		0.0625 ~ 2.500	$Y = 6.86 \times 10^5X - 4.99 \times 10^4$	0.9980	0.0063	0.0125
16	A	Fonofos	17.31	246(100)	137(141)	174(15)	202(6)	0.0625 ~ 2.500	$Y = 1.43 \times 10^6X - 1.10 \times 10^5$	0.9975	0.0063	0.0125
17	A	Etrimfos	17.92	292(100)	181(40)	277(31)		0.0625 ~ 2.500	$Y = 8.55 \times 10^5X - 6.25 \times 10^4$	0.9976	0.0063	0.0125
18	A	Simazine	17.85	201(100)	186(62)	173(42)		0.0625 ~ 2.500	$Y = 1.19 \times 10^6X - 9.71 \times 10^4$	0.9965	0.0063	0.0125
19	A	Propetamphos	17.97	138(100)	194(49)	236(30)		0.0625 ~ 2.500	$Y = 2.44 \times 10^6X - 2.24 \times 10^5$	0.9968	0.0063	0.0125
20	A	Secbumeton	18.36	196(100)	210(38)	225(39)		0.0625 ~ 2.500	$Y = 3.16 \times 10^6X - 3.21 \times 10^5$	0.9952	0.0063	0.0125
21	A	Dichlofenthion	18.80	279(100)	223(78)	251(38)		0.0625 ~ 2.500	$Y = 1.45 \times 10^6X - 8.71 \times 10^4$	0.9986	0.0063	0.0125
22	A	Pronamide	18.72	173(100)	175(62)	255(22)		0.0625 ~ 2.500	$Y = 2.33 \times 10^6X - 2.70 \times 10^5$	0.9905	0.0063	0.0125
23	A	Mexacarbate	18.83	165(100)	150(66)	222(27)		0.1875 ~ 7.500	$Y = 2.74 \times 10^6X - 9.75 \times 10^5$	0.9924	0.0188	0.0375
24	A	Aldrin	19.67	263(100)	265(65)	293(40)	329(8)	0.1250 ~ 5.000	$Y = 6.16 \times 10^5X - 6.01 \times 10^4$	0.9990	0.0125	0.0250
25	A	Dinitramine	19.35	305(100)	307(38)	261(29)		0.2500 ~ 10.00	$Y = 8.42 \times 10^5X - 3.98 \times 10^5$	0.9956	0.0250	0.0500
26	A	Ronnel	19.80	285(100)	287(67)	125(32)		0.1250 ~ 5.000	$Y = 2.37 \times 10^6X - 3.41 \times 10^5$	0.9978	0.0125	0.0250
27	A	Prometryne	20.13	241(100)	184(78)	226(60)		0.0625 ~ 2.500	$Y = 1.97 \times 10^6X - 1.82 \times 10^5$	0.9961	0.0063	0.0125
28	A	Cyprazine	20.18	212(100)	227(58)	170(29)		0.0625 ~ 2.500	$Y = 1.81 \times 10^6X - 1.38 \times 10^5$	0.9978	0.0063	0.0125
29	A	Vinclozolin	20.29	285(100)	212(109)	198(96)		0.0625 ~ 2.500	$Y = 4.84 \times 10^5X - 3.88 \times 10^4$	0.9973	0.0063	0.0125
30	A	beta-HCH	20.31	219(100)	217(78)	181(94)	254(12)	0.0625 ~ 2.500	$Y = 6.87 \times 10^5X - 3.02 \times 10^4$	0.9992	0.0063	0.0125
31	A	Metalaxyl	20.67	206(100)	249(53)	234(38)		0.1875 ~ 7.500	$Y = 1.23 \times 10^6X - 2.59 \times 10^5$	0.9982	0.0188	0.0375
32	A	Chlorpyrifos-ethyl	20.96	314(100)	258(57)	286(42)		0.0625 ~ 2.500	$Y = 6.84 \times 10^5X - 4.74 \times 10^4$	0.9985	0.0063	0.0125
33	A	Methyl-parathion	20.82	263(100)	233(66)	246(8)	200(6)	0.2500 ~ 10.00	$Y = 1.06 \times 10^6X - 6.40 \times 10^5$	0.9892	0.0250	0.0500
34	A	Anthraquinone	21.49	208(100)	180(84)	152(69)		0.0625 ~ 2.500	$Y = 2.27 \times 10^6X - 3.41 \times 10^5$	0.9862	0.0063	0.0125
35	A	delta-HCH	21.16	219(100)	217(80)	181(99)	254(10)	0.1250 ~ 5.000	$Y = 6.21 \times 10^5X - 7.51 \times 10^4$	0.9986	0.0125	0.0250
36	A	Fenthion	21.53	278(100)	169(16)	153(9)		0.0625 ~ 2.500	$Y = 2.91 \times 10^6X - 2.33 \times 10^5$	0.9973	0.0063	0.0125
37	A	Malathion	21.54	173(100)	158(36)	143(15)		0.2500 ~ 10.00	$Y = 1.43 \times 10^6X - 5.23 \times 10^5$	0.9974	0.0250	0.0500
38	A	Fenitrothion	21.62	277(100)	260(52)	247(60)		0.1250 ~ 5.000	$Y = 1.13 \times 10^6X - 2.61 \times 10^5$	0.9957	0.0125	0.0250
39	A	Paraoxon-ethyl	21.57	275(100)	220(60)	247(58)		0.2500 ~ 10.00	$Y = 3.39 \times 10^5X - 2.09 \times 10^5$	0.9892	0.0250	0.0500

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
40	A	Triadimefon	22.22	208(100)	210(50)	181(74)		0.1250 ~ 5.000	$Y = 1.20 \times 10^6X - 2.03 \times 10^5$	0.9976	0.0125	0.0250
41	A	Parathion	22.32	291(100)	186(23)	235(35)	263(11)	0.2500 ~ 10.000	$Y = 1.08 \times 10^6X - 5.62 \times 10^5$	0.9935	0.0250	0.0500
42	A	Pendimethalin	22.59	252(100)	220(22)	162(12)		0.2500 ~ 10.00	$Y = 2.46 \times 10^6X - 1.12 \times 10^6$	0.9960	0.0250	0.0500
43	A	Linuron	22.44	61(100)	248(30)	160(12)		0.2500 ~ 10.00	$Y = 4.30 \times 10^5X - 3.08 \times 10^5$	0.9730	0.0250	0.0500
44	A	Chlorbenside	22.96	268(100)	270(41)	143(11)		0.1250 ~ 5.00	$Y = 6.55 \times 10^5X - 1.37 \times 10^5$	0.9946	0.0125	0.0250
45	A	Bromophos-ethyl	23.06	359(100)	303(77)	357(74)		0.0625 ~ 2.500	$Y = 8.39 \times 10^5X - 6.63 \times 10^4$	0.9973	0.0063	0.0125
46	A	Quinalphos	23.10	146(100)	298(28)	157(66)		0.0625 ~ 2.500	$Y = 1.93 \times 10^6X - 1.91 \times 10^5$	0.9959	0.0063	0.0125
47	A	*trans*-Chlordane	23.29	373(100)	375(96)	377(51)		0.0625 ~ 2.500	$Y = 1.09 \times 10^6X - 5.33 \times 10^4$	0.9989	0.0063	0.0125
48	A	Phenthoate	23.30	274(100)	246(24)	320(5)		0.1250 ~ 5.000	$Y = 1.37 \times 10^6X - 2.52 \times 10^5$	0.9970	0.0125	0.0250
49	A	Metazachlor	23.32	209(100)	133(120)	211(32)		0.1875 ~ 7.500	$Y = 1.18 \times 10^6X - 2.26 \times 10^5$	0.9984	0.0188	0.0375
50	A	Fenothiocarb	23.79	72(100)	160(37)	253(15)		1.0000 ~ 5.000	$Y = 2.27 \times 10^4X - 1.21 \times 10^4$	0.9955	0.1000	0.2000
51	A	Prothiophos	24.04	309(100)	267(88)	162(55)		0.0625 ~ 2.500	$Y = 9.17 \times 10^5X - 9.14 \times 10^4$	0.9957	0.0063	0.0125
52	A	Chlorfurenol	24.15	215(100)	152(40)	274(11)		0.1875 ~ 7.500	$Y = 4.48 \times 10^6X - 1.29 \times 10^6$	0.9960	0.0188	0.0375
53	A	Dieldrin	24.43	263(100)	277(82)	380(30)	345(35)	0.1250 ~ 5.000	$Y = 3.00 \times 10^5X - 2.58 \times 10^4$	0.9994	0.0125	0.0250
54	A	Procymidone	24.36	283(100)	285(70)	255(15)		0.0625 ~ 2.500	$Y = 1.18 \times 10^6X - 6.98 \times 10^4$	0.9979	0.0063	0.0125
55	A	Methidathion	24.49	145(100)	157(2)	302(4)		0.1250 ~ 5.000	$Y = 2.58 \times 10^6X - 5.55 \times 10^5$	0.9948	0.0125	0.0250
56	A	Cyanazine	24.94	225(100)	240(56)	198(61)		0.1875 ~ 7.500	$Y = 1.26 \times 10^6X - 4.10 \times 10^5$	0.9952	0.0188	0.0375
57	A	Napropamide	24.84	271(100)	128(111)	171(34)		0.1875 ~ 7.500	$Y = 9.05 \times 10^5X - 2.34 \times 10^5$	0.9963	0.0188	0.0375
58	A	Oxadiazone	25.06	175(100)	258(62)	302(37)		0.0625 ~ 2.500	$Y = 1.56 \times 10^6X - 1.01 \times 10^5$	0.9980	0.0063	0.0125
59	A	Fenamiphos	25.29	303(100)	154(56)	288(31)	217(22)	0.1875 ~ 7.500	$Y = 1.80 \times 10^6X - 8.73 \times 10^5$	0.9864	0.0188	0.0375
60	A	Tetrasul	25.85	252(100)	324(64)	254(68)		0.0625 ~ 2.500	$Y = 1.60 \times 10^6X - 1.21 \times 10^5$	0.9958	0.0063	0.0125
61	A	Aramite	25.60	185(100)	319(37)	334(32)		0.0625 ~ 2.500	$Y = 3.89 \times 10^5X - 3.66 \times 10^4$	0.9927	0.0063	0.0125
62	A	Bupirimate	26.00	273(100)	316(41)	208(83)		0.0625 ~ 2.500	$Y = 1.73 \times 10^6X - 1.57 \times 10^5$	0.9954	0.0063	0.0125
63	A	Carboxin	26.25	235(100)	143(168)	87(52)		0.1875 ~ 7.500	$Y = 1.49 \times 10^6X - 5.15 \times 10^5$	0.9930	0.0188	0.0375
64	A	Flutolanil	26.23	173(100)	145(25)	323(14)		0.0625 ~ 2.500	$Y = 6.85 \times 10^6X - 7.11 \times 10^5$	0.9951	0.0063	0.0125
65	A	4,4′-DDD	26.59	235(100)	237(64)	199(12)	165(46)	0.0625 ~ 2.500	$Y = 4.46 \times 10^6X - 5.15 \times 10^5$	0.9930	0.0063	0.0125
66	A	Ethion	26.69	231(100)	384(13)	199(9)		0.1250 ~ 5.000	$Y = 1.91 \times 10^6X - 4.27 \times 10^5$	0.9944	0.0125	0.0250
67	A	Sulprofos	26.87	322(100)	156(62)	280(11)		0.1250 ~ 5.000	$Y = 1.45 \times 10^6X - 2.67 \times 10^5$	0.9959	0.0125	0.0250
68	A	Etaconazole-1	26.81	245(100)	173(85)	247(65)		0.1875 ~ 7.500	$Y = 5.57 \times 10^5X - 1.69 \times 10^5$	0.9948	0.0188	0.0375
69	A	Etaconazole-2	26.89	245(100)	173(85)	247(65)		0.1875 ~ 7.500	$Y = 8.08 \times 10^5X - 1.78 \times 10^5$	0.9976	0.0188	0.0375
70	A	Myclobutanil	27.19	179(100)	288(14)	150(45)		0.0625 ~ 2.500	$Y = 1.90 \times 10^6X - 1.74 \times 10^5$	0.9958	0.0063	0.0125
71	A	Diclofop-methyl	28.08	253(100)	281(50)	342(82)		0.0625 ~ 2.500	$Y = 1.23 \times 10^6X - 4.28 \times 10^4$	0.9958	0.0063	0.0125
72	A	Propiconazole	28.15	259(100)	173(97)	261(65)		0.1875 ~ 7.500	$Y = 6.40 \times 10^5X - 1.94 \times 10^5$	0.9942	0.0188	0.0375
73	A	Fensulfothin	27.94	292(100)	308(22)	293(73)		0.1250 ~ 5.000	$Y = 3.84 \times 10^5X - 5.31 \times 10^4$	0.9900	0.0125	0.0250
74	A	Bifenthrin	28.57	181(100)	166(25)	165(23)		0.0625 ~ 2.500	$Y = 7.25 \times 10^6X - 7.29 \times 10^5$	0.9936	0.0063	0.0125
75	A	Mirex	28.72	272(100)	237(49)	274(80)		0.0625 ~ 2.500	$Y = 1.29 \times 10^6X - 6.90 \times 10^4$	0.9974	0.0063	0.0125
76	A	Benodanil	29.14	231(100)	323(38)	203(22)		0.1875 ~ 7.500	$Y = 5.34 \times 10^6X - 2.7 \times 10^6$	0.9899	0.0188	0.0375
77	A	Nuarimol	28.90	314(100)	235(155)	203(108)		0.1250 ~ 5.000	$Y = 6.42 \times 10^5X - 1.13 \times 10^5$	0.9962	0.0125	0.0250
78	A	Methoxychlor	29.38	227(100)	228(16)	212(4)		0.0625 ~ 2.500	$Y = 5.40 \times 10^6X - 6.40 \times 10^5$	0.9921	0.0063	0.0125
79	A	Oxadixyl	29.50	163(100)	233(18)	278(11)		0.0625 ~ 2.500	$Y = 7.29 \times 10^5X - 6.65 \times 10^4$	0.9897	0.0063	0.0125
80	A	Tetramethirn	29.59	164(100)	135(3)	232(1)		0.1250 ~ 5.000	$Y = 4.35 \times 10^6X - 9.91 \times 10^5$	0.9928	0.0125	0.0250

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
81	A	Tebuconazole	29.51	250(100)	163(55)	252(36)		0.1875 ~ 7.500	$Y = 1.39 \times 10^6X - 4.05 \times 10^5$	0.9941	0.0188	0.0375
82	A	Norflurazon	29.99	303(100)	145(101)	102(47)		0.0625 ~ 2.500	$Y = 1.16 \times 10^6X - 1.33 \times 10^5$	0.9879	0.0063	0.0125
83	A	Pyridaphenthion	30.17	340(100)	199(48)	188(51)		0.0625 ~ 2.500	$Y = 1.04 \times 10^6X - 1.47 \times 10^5$	0.9841	0.0063	0.0125
84	A	Phosmet	30.46	160(100)	161(11)	317(4)		0.1250 ~ 5.000	$Y = 2.04 \times 10^6X - 6.08 \times 10^5$	0.9861	0.0125	0.0250
85	A	Tetradifon	30.70	227(100)	356(70)	159(196)		0.0625 ~ 2.500	$Y = 4.97 \times 10^5X - 2.54 \times 10^4$	0.9966	0.0063	0.0125
86	A	Oxycarboxin	31.00	175(100)	267(52)	250(3)		0.3750 ~ 15.00	$Y = 1.34 \times 10^6X - 1.23 \times 10^6$	0.9850	0.0375	0.0750
87	A	cis-Permethrin	31.42	183(100)	184(15)	255(2)		0.0625 ~ 2.500	$Y = 4.92 \times 10^6X - 4.33 \times 10^5$	0.9935	0.0063	0.0125
88	A	*trans*-Permethrin	31.68	183(100)	184(15)	255(2)		0.0625 ~ 2.500	$Y = 4.19 \times 10^6X - 4.17 \times 10^5$	0.9911	0.0063	0.0125
89	A	Pyrazophos	31.60	221(100)	232(35)	373(19)		0.1250 ~ 5.000	$Y = 2.23 \times 10^6X - 5.32 \times 10^5$	0.9904	0.0125	0.0250
90	A	Cypermethrin	33.19	181(100)	152(23)	180(16)		0.1875 ~ 7.500	$Y = 6.63 \times 10^5X - 1.77 \times 10^5$	0.9919	0.0188	0.0375
			33.38									
			33.46									
			33.56									
91	A	Fenvalerate	34.45	167(100)	225(53)	419(37)	181(41)	0.2500 ~ 10.00	$Y = 1.54 \times 10^6X - 4.39 \times 10^5$	0.9928	0.0250	0.0500
			34.79									
92	A	Deltamethrin	35.77	181(100)	172(25)	174(25)		0.3750 ~ 15.00	$Y = 9.80 \times 10^5X - 6.51 \times 10^5$	0.9921	0.0375	0.0750
93	B	EPTC	8.54	128(100)	189(30)	132(32)		0.1875 ~ 7.500	$Y = 1.57 \times 10^6X - 1.31 \times 10^5$	0.9993	0.0188	0.0375
94	B	Butylate	9.49	156(100)	146(115)	217(27)		0.1875 ~ 7.500	$Y = 1.10 \times 10^6X - 1.13 \times 10^5$	0.9994	0.0188	0.0375
95	B	Dichlobenil	9.75	171(100)	173(68)	136(15)		0.0250 ~ 0.500	$Y = 2.99 \times 10^6X - 1.58 \times 10^4$	0.9998	0.0025	0.0050
96	B	Pebulate	10.18	128(100)	161(21)	203(20)		0.1875 ~ 7.500	$Y = 2.11 \times 10^6X - 2.26 \times 10^5$	0.9994	0.0188	0.0375
97	B	Nitrapyrin	10.89	194(100)	196(97)	198(23)		0.1875 ~ 7.500	$Y = 1.41 \times 10^6X - 4.43 \times 10^5$	0.9957	0.0188	0.0375
98	B	Mevinphos	11.23	127(100)	192(39)	164(29)		0.1250 ~ 5.000	$Y = 1.77 \times 10^6X - 3.53 \times 10^5$	0.9957	0.0125	0.0250
99	B	Chloroneb	11.85	191(100)	193(67)	206(66)		0.0625 ~ 2.500	$Y = 2.04 \times 10^6X - 9.36 \times 10^4$	0.9990	0.0063	0.0125
100	B	Tecnazene	13.54	261(100)	203(135)	215(113)		0.2500 ~ 5.000	$Y = 3.92 \times 10^5X - 6.99 \times 10^4$	0.9985	0.0250	0.0500
101	B	Heptenophos	13.78	124(100)	215(17)	250(14)		0.1875 ~ 7.500	$Y = 1.71 \times 10^6X - 4.01 \times 10^5$	0.9979	0.0188	0.0375
102	B	Hexachlorobenzene	14.69	284(100)	286(81)	282(51)		0.0625 ~ 2.500	$Y = 1.80 \times 10^6X - 5.09 \times 10^4$	0.9996	0.0063	0.0125
103	B	Ethoprophos	14.40	158(100)	200(40)	242(23)	168(15)	0.1875 ~ 7.500	$Y = 1.04 \times 10^6X - 2.32 \times 10^5$	0.9982	0.0188	0.0375
104	B	*cis*-Diallate	14.75	234(100)	236(37)	128(38)		0.1250 ~ 5.000	$Y = 2.70 \times 10^5X - 1.65 \times 10^4$	0.9998	0.0125	0.0250
105	B	Propachlor	14.73	120(100)	176(45)	211(11)		0.1875 ~ 7.500	$Y = 2.89 \times 10^6X - 3.00 \times 10^5$	0.9998	0.0188	0.0375
106	B	*trans*-Diallate	15.29	234(100)	236(37)	128(38)		0.1250 ~ 5.000	$Y = 1.02 \times 10^6X - 9.85 \times 10^4$	0.9994	0.0125	0.0250
107	B	Trifluralin	15.23	306(100)	264(72)	335(7)		0.1250 ~ 5.000	$Y = 1.83 \times 10^6X - 4.47 \times 10^5$	0.9930	0.0125	0.0250
108	B	Chlorpropham	15.49	213(100)	171(59)	153(24)		0.1250 ~ 5.000	$Y = 7.24 \times 10^5X - 1.22 \times 10^5$	0.9971	0.0125	0.0250
109	B	Sulfotep	15.55	322(100)	202(43)	238(27)	266(24)	0.0625 ~ 2.500	$Y = 1.61 \times 10^6X - 8.57 \times 10^4$	0.9991	0.0063	0.0125
110	B	Sulfallate	15.75	188(100)	116(7)	148(4)		0.1250 ~ 5.000	$Y = 2.84 \times 10^6X - 6.05 \times 10^5$	0.9958	0.0125	0.0250
111	B	alpha-HCH	16.06	219(100)	183(98)	221(47)	254(6)	0.0625 ~ 2.500	$Y = 6.51 \times 10^5X - 2.25 \times 10^4$	0.9994	0.0063	0.0125
112	B	Terbufos	16.83	231(100)	153(25)	288(10)	186(13)	0.1250 ~ 5.000	$Y = 1.77 \times 10^6X - 2.82 \times 10^5$	0.9977	0.0125	0.0250
113	B	Terbumeton	17.20	210(100)	169(66)	225(32)		0.1875 ~ 7.500	$Y = 2.47 \times 10^6X - 5.48 \times 10^5$	0.9983	0.0188	0.0375
114	B	Profluralin	17.36	318(100)	304(47)	347(13)		0.2500 ~ 10.00	$Y = 9.72 \times 10^5X - 4.42 \times 10^5$	0.9955	0.0250	0.0500
115	B	Dioxathion	17.51	270(100)	197(43)	169(19)		0.2500 ~ 10.00	$Y = 1.58 \times 10^5X - 2.19 \times 10^4$	0.9993	0.0250	0.0500
116	B	Propazine	17.67	214(100)	229(67)	172(51)		0.0625 ~ 2.500	$Y = 1.63 \times 10^6X - 9.61 \times 104$	0.9988	0.0063	0.0125
117	B	Chlorbufam	17.85	223(100)	153(53)	164(64)		0.2500 ~ 10.00	$Y = 5.75 \times 10^5X - 2.01 \times 10^5$	0.9921	0.0250	0.0500

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
118	B	Dicloran	17.89	206(100)	176(128)	160(52)		0.2500 ~ 10.00	$Y = 6.59 \times 10^5X - 1.86 \times 10^5$	0.9963	0.0250	0.0500
119	B	Terbuthylazine	18.07	214(100)	229(33)	173(35)		0.0625 ~ 2.500	$Y = 9.62 \times 10^5X - 1.21 \times 10^5$	0.9886	0.0063	0.0125
120	B	Monolinuron	18.15	61(100)	126(45)	214(51)		0.2500 ~ 10.00	$Y = 1.78 \times 10^6X - 9.80 \times 10^5$	0.9888	0.0250	0.0500
121	B	Flufenoxuron	18.83	305(100)	126(67)	307(32)		0.1875 ~ 7.500	$Y = 1.40 \times 10^5X + 5.53 \times 10^4$	0.9929	0.0188	0.0375
122	B	Cyanophos	18.73	243(100)	180(8)	148(3)		0.1250 ~ 5.000	$Y = 2.01 \times 10^6X - 2.99 \times 10^5$	0.9980	0.0125	0.0250
123	B	Chlorpyrifos-methyl	19.38	286(100)	288(70)	197(5)		0.0625 ~ 2.500	$Y = 1.55 \times 10^6X - 1.25 \times 10^5$	0.9972	0.0063	0.0125
124	B	Desmetryn	19.64	213(100)	198(60)	171(30)		0.0625 ~ 2.500	$Y = 1.92 \times 10^6X - 1.86 \times 10^5$	0.9964	0.0063	0.0125
125	B	Dimethachlor	19.80	134(100)	197(47)	210(16)		0.1875 ~ 7.500	$Y = 3.98 \times 10^6X - 7.53 \times 10^5$	0.9989	0.0188	0.0375
126	B	Alachlor	20.03	188(100)	237(35)	269(15)		0.1875 ~ 7.500	$Y = 1.27 \times 10^6X - 2.26 \times 10^5$	0.9990	0.0188	0.0375
127	B	Pirimiphos-methyl	20.30	290(100)	276(86)	305(74)		0.0625 ~ 2.500	$Y = 1.36 \times 10^6X - 1.07 \times 10^5$	0.9977	0.0063	0.0125
128	B	Terbutryn	20.61	226(100)	241(64)	185(73)		0.1250 ~ 5.000	$Y = 1.95 \times 10^6X - 3.07 \times 10^5$	0.9980	0.0125	0.0250
129	B	Thiobencarb	20.63	100(100)	257(25)	259(9)		0.1250 ~ 5.000	$Y = 4.00 \times 10^6X - 5.32 \times 10^5$	0.9987	0.0125	0.0250
130	B	Aspon	20.62	211(100)	253(52)	378(14)		0.1250 ~ 5.000	$Y = 3.58 \times 10^6X - 1.49 \times 10^5$	0.9994	0.0125	0.0250
131	B	Dicofol	21.33	139(100)	141(72)	250(23)	251(4)	0.1250 ~ 5.000	$Y = 1.00 \times 10^6X - 1.25 \times 10^5$	0.9980	0.0125	0.0250
132	B	Metolachlor	21.34	238(100)	162(159)	240(33)		0.0625 ~ 2.500	$Y = 2.13 \times 10^6X - 1.69 \times 10^5$	0.9977	0.0063	0.0125
133	B	Oxy-chlordane	21.63	387(100)	237(50)	185(68)		0.2500 ~ 2.500	$Y = 1.97 \times 10^5X - 1.23 \times 10^4$	0.9997	0.0250	0.0500
134	B	Pirimiphos-ethyl	21.59	333(100)	318(93)	304(69)		0.1250 ~ 5.000	$Y = 1.16 \times 10^6X - 1.83 \times 10^5$	0.9980	0.0125	0.0250
135	B	Methoprene	21.71	73(100)	191(29)	153(29)		0.2500 ~ 10.00	$Y = 3.30 \times 10^6X - 1.31 \times 10^6$	0.9975	0.0250	0.0500
136	B	Bromofos	21.75	331(100)	329(75)	213(7)		0.1250 ~ 5.000	$Y = 1.50 \times 10^6X - 1.98 \times 10^5$	0.9987	0.0125	0.0250
137	B	Dichlofluanid	21.68	224(100)	226(74)	167(120)		0.3750 ~ 15.00	$Y = 5.53 \times 10^5X - 3.40 \times 10^5$	0.9977	0.0375	0.0750
138	B	Ethofumesate	21.84	207(100)	161(54)	286(27)		0.1250 ~ 5.000	$Y = 2.00 \times 10^6X - 2.03 \times 10^5$	0.9992	0.0125	0.0250
139	B	Isopropalin	22.10	280(100)	238(40)	222(4)		0.1250 ~ 5.000	$Y = 1.54 \times 10^6X - 2.40 \times 10^5$	0.9982	0.0125	0.0250
140	B	Endosulfan-1	23.10	241(100)	265(66)	339(46)		0.3750 ~ 15.00	$Y = 1.47 \times 10^5X - 3.22 \times 10^4$	0.9991	0.0375	0.0750
141	B	Propanil	22.68	161(100)	217(21)	163(62)		0.1250 ~ 5.000	$Y = 1.99 \times 10^6X - 4.75 \times 10^5$	0.9930	0.0125	0.0250
142	B	Isofenphos	22.99	213(100)	255(44)	185(45)		0.1250 ~ 5.000	$Y = 1.54 \times 10^6X - 2.40 \times 10^5$	0.9982	0.0125	0.0250
143	B	Crufomate	22.93	256(100)	182(154)	276(58)		0.3750 ~ 15.00	$Y = 1.85 \times 10^6X - 1.63 \times 10^6$	0.9914	0.0375	0.0750
144	B	Chlorfenvinphos	23.19	323(100)	267(139)	269(92)		0.1875 ~ 7.500	$Y = 8.38 \times 10^5X - 2.30 \times 10^5$	0.9976	0.0188	0.0375
145	B	*cis*-Chlordane	23.55	373(100)	375(96)	377(51)		0.1250 ~ 5.000	$Y = 9.13 \times 10^5X - 7.13 \times 10^4$	0.9994	0.0125	0.0250
146	B	Tolylfluanide	23.45	238(100)	240(71)	137(210)		0.1875 ~ 7.500	$Y = 5.19 \times 10^5X - 1.68 \times 10^5$	0.9981	0.0188	0.0375
147	B	4,4′-DDE	23.92	318(100)	316(80)	246(139)	248(70)	0.0625 ~ 2.500	$Y = 1.41 \times 10^6X - 5.29 \times 10^4$	0.9994	0.0063	0.0125
148	B	Butachlor	23.82	176(100)	160(75)	188(46)		0.1250 ~ 5.000	$Y = 1.84 \times 10^6X - 3.26 \times 10^5$	0.9970	0.0125	0.0250
149	B	Chlozolinate	23.83	259(100)	188(83)	331(91)		0.1250 ~ 5.000	$Y = 6.77 \times 10^5X - 6.41 \times 10^4$	0.9994	0.0125	0.0250
150	B	Crotoxyphos	23.94	193(100)	194(16)	166(51)		0.3750 ~ 15.00	$Y = 4.98 \times 10^5X - 4.39 \times 10^5$	0.9904	0.0375	0.0750
151	B	Iodofenphos	24.33	377(100)	379(37)	250(6)		0.1250 ~ 5.000	$Y = 1.32 \times 10^6X - 3.31 \times 10^5$	0.9940	0.0125	0.0250
152	B	Tetrachlorvinphos	24.36	329(100)	331(96)	333(31)		0.1875 ~ 7.500	$Y = 1.61 \times 10^6X - 4.88 \times 10^5$	0.9975	0.0188	0.0375
153	B	Chlorbromuron	24.37	61(100)	294(17)	292(13)		1.5000 ~ 60.00	$Y = 1.63 \times 10^5X - 6.33 \times 10^5$	0.9843	0.1500	0.3000
154	B	Profenofos	24.65	339(100)	374(39)	297(37)		0.3750 ~ 15.00	$Y = 4.53 \times 10^5X - 2.76 \times 10^5$	0.9969	0.0375	0.0750
155	B	Fluorochloridone	25.14	311(100)	313(64)	187(85)		0.5000 ~ 5.000	$Y = 1.14 \times 10^5X - 1.75 \times 10^4$	0.9994	0.0500	0.1000
156	B	Buprofezin	24.87	105(100)	172(54)	305(24)		0.1250 ~ 5.000	$Y = 7.95 \times 10^6X - 8.95 \times 10^5$	0.9987	0.0125	0.0250
157	B	2,4′-DDD	24.94	235(100)	237(65)	165(39)	199(15)	0.1250 ~ 2.500	$Y = 1.16 \times 10^5X + 2.92 \times 10^4$	0.9997	0.0125	0.0250
158	B	Endrin	25.15	263(100)	317(30)	345(26)		0.7500 ~ 30.00	$Y = 3.08 \times 10^5X - 2.37 \times 10^5$	0.9982	0.0750	0.1500

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
159	B	Hexaconazole	24.92	214(100)	231(62)	256(26)		0.7500 ~ 15.00	$Y = 5.28 \times 10^4X - 2.04 \times 10^4$	0.9989	0.0750	0.1500
160	B	Chlorfenson	25.05	302(100)	175(282)	177(103)		0.1250 ~ 5.000	$Y = 5.95 \times 10^5X - 8.13 \times 10^4$	0.9980	0.0125	0.0250
161	B	2,4′-DDT	25.56	235(100)	237(63)	165(37)	199(14)	0.1250 ~ 5.000	$Y = 2.71 \times 10^6X - 4.24 \times 10^5$	0.9978	0.0125	0.0250
162	B	Paclobutrazol	25.21	236(100)	238(37)	167(39)		0.1875 ~ 7.500	$Y = 1.76 \times 10^6X - 6.51 \times 10^5$	0.9941	0.0188	0.0375
163	B	Methoprotryne	25.63	256(100)	213(24)	271(17)		0.1875 ~ 7.500	$Y = 1.80 \times 10^6X - 5.13 \times 10^5$	0.9973	0.0188	0.0375
164	B	Erbon	25.68	169(100)	171(35)	223(30)		0.1250 ~ 2.500	$Y = 4.86 \times 10^5X - 4.10 \times 10^4$	0.9994	0.0125	0.0250
165	B	Chloropropylate	25.85	251(100)	253(64)	141(18)		0.0625 ~ 2.500	$Y = 2.99 \times 10^6X - 2.62 \times 10^5$	0.9970	0.0063	0.0125
166	B	Flamprop-methyl	25.90	105(100)	77(26)	276(11)		0.0625 ~ 2.500	$Y = 6.68 \times 10^6X - 4.53 \times 10^5$	0.9983	0.0063	0.0125
167	B	Nitrofen	26.12	283(100)	253(90)	202(48)	139(15)	0.3750 ~ 15.00	$Y = 1.20 \times 10^6X - 1.04 \times 10^6$	0.9905	0.0375	0.0750
168	B	Oxyfluorfen	26.13	252(100)	361(35)	300(35)		0.2500 ~ 10.00	$Y = 1.54 \times 10^6X - 7.81 \times 10^5$	0.9945	0.0250	0.0500
169	B	Chlorthiophos	26.52	325(100)	360(52)	297(54)		0.1875 ~ 7.500	$Y = 6.89 \times 10^5X - 1.58 \times 10^5$	0.9978	0.0188	0.0375
170	B	Endosulfan-II	26.72	241(100)	265(66)	339(46)		1.5000 ~ 15.00	$Y = 2.45 \times 10^4X - 1.10 \times 10^4$	0.9994	0.1500	0.3000
171	B	Flamprop-isopropyl	26.70	105(100)	276(19)	363(3)		0.0625 ~ 2.500	$Y = 7.37 \times 10^6X - 5.64 \times 10^5$	0.9974	0.0063	0.0125
172	B	4,4′-DDT	27.22	235(100)	237(65)	246(7)	165(34)	0.1250 ~ 5.000	$Y = 2.76 \times 10^6X - 5.05 \times 10^5$	0.9971	0.0125	0.0250
173	B	Carbofenothion	27.19	157(100)	342(49)	199(28)		0.1250 ~ 5.000	$Y = 1.32 \times 10^6X -2.79 \times 10^5$	0.9955	0.0125	0.0250
174	B	Benalyxyl	27.54	148(100)	206(32)	325(8)		0.0625 ~ 2.500	$Y = 3.38 \times 10^6X - 2.55 \times 10^5$	0.9972	0.0063	0.0125
175	B	Edifenphos	27.94	173(100)	310(76)	201(37)		0.1250 ~ 5.000	$Y = 1.25 \times 10^6X - 3.66 \times 10^5$	0.9912	0.0125	0.0250
176	B	Triazophos	28.23	161(100)	172(47)	257(38)		0.1875 ~ 7.500	$Y = 1.05 \times 10^6X - 3.63 \times 10^5$	0.9944	0.0188	0.0375
177	B	Cyanofenphos	28.43	157(100)	169(56)	303(20)		0.0625 ~ 2.500	$Y = 2.34 \times 10^6X - 1.98 \times 10^5$	0.9967	0.0063	0.0125
178	B	Chlorbenside sulfone	28.88	127(100)	99(14)	89(33)		0.1250 ~ 5.000	$Y = 1.89 \times 10^6X - 2.89 \times 10^5$	0.9966	0.0125	0.0250
179	B	Endosulfan-sulfate	29.05	387(100)	272(165)	389(64)		0.1875 ~ 7.500	$Y = 2.46 \times 10^5X - 3.43 \times 10^4$	0.9985	0.0188	0.0375
180	B	Bromopropylate	29.30	341(100)	183(34)	339(49)		0.1250 ~ 5.000	$Y = 3.62 \times 10^6X - 6.59 \times 10^5$	0.9963	0.0125	0.0250
181	B	Benzoylprop-ethyl	29.40	292(100)	365(36)	260(37)		0.1875 ~ 7.500	$Y = 5.20 \times 10^5X - 1.00 \times 10^5$	0.9983	0.0188	0.0375
182	B	Fenpropathrin	29.56	265(100)	181(237)	349(25)		0.1250 ~ 5.000	$Y = 4.35 \times 10^5X - 7.38 \times 10^4$	0.9966	0.0125	0.0250
183	B	Leptophos	30.19	377(100)	375(73)	379(28)					0.0125	0.0250
184	B	EPN	30.06	157(100)	169(53)	323(14)		0.2500 ~ 10.00	$Y = 2.08 \times 10^6X - 1.17 \times 10^6$	0.9913	0.0250	0.0500
185	B	Hexazinone	30.14	171(100)	252(3)	128(12)		0.1875 ~ 7.500	$Y = 5.21 \times 10^6X - 1.27 \times 10^6$	0.9970	0.0188	0.0375
186	B	Phosalone	31.22	182(100)	367(30)	154(20)		0.1250 ~ 5.000	$Y = 1.19 \times 10^6X - 2.42 \times 10^5$	0.9955	0.0125	0.0250
187	B	Azinphos-methyl	31.41	160(100)	132(71)	77(58)		0.7500 ~ 15.00	$Y = 1.82 \times 10^5X - 1.18 \times 10^5$	0.9971	0.0750	0.1500
188	B	Fenarimol	31.65	139(100)	219(70)	330(42)		0.1250 ~ 5.000	$Y = 1.19 \times 10^6X - 1.33 \times 10^5$	0.9993	0.0125	0.0250
189	B	Azinphos-ethyl	32.01	160(100)	132(103)	77(51)		0.1250 ~ 5.000	$Y = 1.15 \times 10^6X - 2.82 \times 10^5$	0.9930	0.0125	0.0250
190	B	Prochloraz	33.07	180(100)	308(59)	266(18)		0.3750 ~ 15.00	$Y = 5.01 \times 10^5X - 5.72 \times 10^4$	0.9919	0.0375	0.0750
191	B	Coumaphos	33.22	362(100)	226(56)	364(39)	334(15)	0.3750 ~ 15.00	$Y = 7.20 \times 10^5X - 4.57 \times 10^5$	0.9955	0.0375	0.0750
192	B	Cyfluthrin	32.94	206(100)	199(63)	226(72)		0.7500 ~ 30.00	$Y = 2.38 \times 10^5X - 1.95 \times 10^5$	0.9966	0.0750	0.1500
			33.12									
193	B	Fluvalinate	34.94	250(100)	252(38)	181(18)		0.7500 ~ 30.00	$Y = 3.44 \times 10^6X - 3.89 \times 10^6$	0.9954	0.0750	0.1500
			35.02									
194	C	Dichlorvos	7.80	109(100)	185(34)	220(7)		0.3750 ~ 15.00	$Y = 2.58 \times 10^6X - 9.22 \times 10^5$	0.9990	0.0375	0.0750
195	C	Biphenyl	9.00	154(100)	153(40)	152(27)		0.0625 ~ 2.500	$Y = 6.61 \times 10^6X - 1.66 \times 10^5$	0.9998	0.0063	0.0125
196	C	Vernolate	9.82	128(100)	146(17)	203(9)		0.0625 ~ 2.500	$Y = 2.12 \times 10^6X - 6.55 \times 10^4$	0.9997	0.0063	0.0125
197	C	3,5-Dichloroaniline	11.20	161(100)	163(62)	126(10)		0.0625 ~ 2.500	$Y = 9.29 \times 10^5X + 1.10 \times 10^5$	0.9905	0.0063	0.0125

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
198	C	Molinate	11.92	126(100)	187(24)	158(2)		0.0625 ~ 2.500	$Y = 2.55 \times 10^6X - 8.80 \times 10^4$	0.9996	0.0063	0.0125
199	C	Methacrifos	11.86	125(100)	208(74)	240(44)		0.0625 ~ 2.500	$Y = 1.10 \times 10^6X - 5.10 \times 10^4$	0.9994	0.0063	0.0125
200	C	2-Phenylphenol	12.47	170(100)	169(72)	141(31)		0.0625 ~ 1.2500	$Y = 1.70 \times 10^6X + 3.54 \times 10^4$	0.9946	0.0063	0.0125
201	C	*cis*-1,2,3,6-Tetrahydrophthalimide	13.39	151(100)	123(16)	122(16)		0.1875 ~ 7.500	$Y = 1.06 \times 10^6X - 2.31 \times 10^5$	0.9985	0.0188	0.0375
202	C	Fenobucarb	14.60	121(100)	150(32)	107(8)		0.1250 ~ 5.000	$Y = 5.44 \times 10^6X - 7.85 \times 10^5$	0.9982	0.0125	0.0250
203	C	Benfluralin	15.23	292(100)	264(20)	276(13)		0.0625 ~ 2.500	$Y = 2.07 \times 10^6X - 2.74 \times 10^5$	0.9888	0.0063	0.0125
204	C	Hexaflumuron	16.20	176(100)	279(28)	277(43)					0.0375	0.0750
205	C	Prometon	16.66	210(100)	225(91)	168(67)		0.1875 ~ 7.500	$Y = 1.47 \times 10^6X - 3.19 \times 10^5$	0.9988	0.0188	0.0375
206	C	Triallate	17.12	268(100)	270(73)	143(19)		0.1250 ~ 5.000	$Y = 8.94 \times 10^5X - 9.82 \times 10^4$	0.9993	0.0125	0.0250
207	C	Pyrimethanil	17.28	198(100)	199(45)	200(5)		0.0625 ~ 2.500	$Y = 5.84 \times 10^6X - 4.82 \times 10^5$	0.9980	0.0063	0.0125
208	C	gamma-HCH	17.48	183(100)	219(93)	254(13)	221(40)	0.1250 ~ 5.000	$Y = 7.39 \times 10^5X - 3.27 \times 10^4$	0.9998	0.0125	0.0250
209	C	Disulfoton	17.61	88(100)	274(15)	186(18)		0.0625 ~ 2.500	$Y = 2.37 \times 10^6X - 1.88 \times 10^5$	0.9983	0.0063	0.0125
210	C	Atrizine	17.64	200(100)	215(62)	173(29)		0.0625 ~ 2.500	$Y = 1.60 \times 10^6X - 1.05 \times 10^5$	0.9991	0.0063	0.0125
211	C	Heptachlor	18.49	272(100)	237(40)	337(27)		0.1875 ~ 7.500	$Y = 6.01 \times 10^5X - 1.16 \times 10^5$	0.9990	0.0188	0.0375
212	C	Iprobenfos	18.44	204(100)	246(18)	288(17)		0.1875 ~ 7.500	$Y = 1.47 \times 10^6X - 6.69 \times 10^5$	0.9895	0.0188	0.0375
213	C	Isazofos	18.54	161(100)	257(53)	285(39)	313(14)	0.1250 ~ 5.000	$Y = 8.48 \times 10^5X - 9.19 \times 10^4$	0.9994	0.0125	0.0250
214	C	Plifenate	18.87	217(100)	175(96)	242(91)		0.2500 ~ 5.000	$Y = 4.07 \times 10^5X - 7.16 \times 10^4$	0.9992	0.0250	0.0500
215	C	Fenpropimorph	19.22	128(100)	303(5)	129(9)		0.0625 ~ 2.500	$Y = 8.00 \times 10^6X - 5.62 \times 10^5$	0.9989	0.0063	0.0125
216	C	Transfluthrin	19.04	163(100)	165(23)	335(7)		0.0625 ~ 2.500	$Y = 3.03 \times 10^6X - 1.80 \times 10^5$	0.9991	0.0063	0.0125
217	C	Fluchloralin	18.89	306(100)	326(87)	264(54)		0.2500 ~ 10.00	$Y = 9.56 \times 10^5X - 4.69 \times 10^5$	0.9952	0.0250	0.0500
218	C	Tolclofos-methyl	19.69	265(100)	267(36)	250(10)		0.0625 ~ 2.500	$Y = 3.46 \times 10^6X - 1.95 \times 10^5$	0.9991	0.0063	0.0125
219	C	Propisochlor	19.89	162(100)	223(200)	146(17)					0.0063	0.0125
220	C	Ametryn	20.11	227(100)	212(53)	185(17)		0.1875 ~ 7.500	$Y = 1.96 \times 10^6X - 4.43 \times 10^5$	0.9989	0.0188	0.0375
221	C	Simetryn	20.18	213(100)	170(26)	198(16)		0.1250 ~ 5.000	$Y = 2.26 \times 10^6X - 2.94 \times 10^5$	0.9990	0.0125	0.0250
222	C	Metobromuron	20.07	61(100)	258(11)	170(16)		0.3750 ~ 15.00	$Y = 1.67 \times 10^5X - 6.17 \times 10^4$	0.9986	0.0375	0.0750
223	C	Metribuzin	20.33	198(100)	199(21)	144(12)		0.1875 ~ 7.500	$Y = 1.61 \times 10^6X - 3.48 \times 10^5$	0.9986	0.0188	0.0375
224	C	Dimethipin	20.38	118(100)	210(26)	103(20)					0.0188	0.0375
225	C	epsilon-HCH	20.78	181(100)	219(76)	254(15)	217(40)				0.0125	0.0250
226	C	Dipropetryn	20.82	255(100)	240(42)	222(20)		0.0625 ~ 2.500	$Y = 1.67 \times 10^6X - 1.52 \times 10^5$	0.9976	0.0063	0.0125
227	C	Formothion	21.42	170(100)	224(97)	257(63)		0.5000 ~ 5.000	$Y = 1.12 \times 10^5X - 3.13 \times 10^4$	0.9993	0.0500	0.1000
228	C	Diethofencarb	21.43	267(100)	225(98)	151(31)		0.3750 ~ 15.00	$Y = 1.15 \times 10^6X - 6.62 \times 10^5$	0.9977	0.0375	0.0750
229	C	Dimepiperate	22.28	119(100)	145(30)	263(8)		2.500 ~ 5.000	$Y = 2.12 \times 10^4X + 4.02 \times 10^4$	1.0000	0.2500	0.5000
230	C	Bioallethrin-1	22.29	123(100)	136(24)	107(29)		0.2500 ~ 10.00	$Y = 1.37 \times 10^6X - 7.09 \times 10^5$	0.9941	0.0250	0.0500
231	C	Bioallethrin-2	22.34	123(100)	136(24)	107(29)		0.2500 ~ 10.00	$Y = 1.49 \times 10^6X - 5.77 \times 10^5$	0.9983	0.0250	0.0500
232	C	2,4′-DDE	22.64	246(100)	318(34)	176(26)	248(65)	0.0625 ~ 2.500	$Y = 2.26 \times 10^6X - 1.16 \times 10^5$	0.9993	0.0063	0.0125
233	C	Fenson	22.54	141(100)	268(53)	77(104)		1.250 ~ 2.500	$Y = 5.69 \times 10^4X - 3.15 \times 10^4$	1.0000	0.1250	0.2500
234	C	Diphenamid	22.87	167(100)	239(30)	165(43)		0.0625 ~ 2.500	$Y = 4.01 \times 10^6X - 2.59 \times 10^5$	0.9989	0.0063	0.0125
235	C	Chlorthion	22.86	297(100)	267(162)	299(45)		0.5000 ~ 5.000	$Y = 3.72 \times 10^5X - 2.23 \times 10^5$	0.9857	0.0500	0.1000
236	C	Prallethrin	23.11	123(100)	105(17)	134(9)		0.1875 ~ 7.500	$Y = 3.52 \times 10^6X - 1.22 \times 10^6$	0.9964	0.0188	0.0375
237	C	Penconazole	23.17	248(100)	250(33)	161(50)		0.1875 ~ 7.500	$Y = 2.32 \times 10^6X - 4.76 \times 10^5$	0.9992	0.0188	0.0375
238	C	Mecarbam	23.46	131(100)	296(22)	329(40)		0.2500 ~ 10.00	$Y = 2.87 \times 10^5X - 2.80 \times 10^5$	0.9986	0.0250	0.0500

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
239	C	Tetraconazole	23.35	336(100)	338(33)	171(10)		0.1875 ~ 7.500	$Y = 2.72 \times 10^6X - 5.43 \times 10^5$	0.9992	0.0188	0.0375
240	C	Propaphos	23.92	304(100)	220(108)	262(34)					0.0125	0.0250
241	C	Flumetralin	24.10	143(100)	157(25)	404(10)		0.1250 ~ 5.000	$Y = 2.51 \times 10^6X - 7.70 \times 10^5$	0.9873	0.0125	0.0250
242	C	Triadimenol	24.22	112(100)	168(81)	130(15)		0.1875 ~ 7.500	$Y = 1.90 \times 10^6X - 5.96 \times 10^5$	0.9972	0.0188	0.0375
243	C	Pretilachlor	24.67	162(100)	238(26)	262(8)		0.1250 ~ 5.000	$Y = 1.40 \times 10^6X - 2.48 \times 10^5$	0.9980	0.0125	0.0250
244	C	Kresoxim-methyl	25.04	116(100)	206(25)	131(66)		0.0625 ~ 2.500	$Y = 2.45 \times 10^6X - 2.13 \times 10^5$	0.9976	0.0063	0.0125
245	C	Fluazifop-butyl	25.21	282(100)	383(44)	254(49)		0.0625 ~ 2.500	$Y = 2.18 \times 10^6X - 2.27 \times 10^5$	0.9961	0.0063	0.0125
246	C	Chlorfluazuron	25.27	321(100)	323(71)	356(8)		0.3750 ~ 7.500	$Y = 1.55 \times 10^5X - 9.15 \times 10^3$	0.9980	0.0375	0.0750
247	C	Chlorobenzilate	25.90	251(100)	253(65)	152(5)		0.0625 ~ 2.500	$Y = 2.62 \times 10^6X - 2.29 \times 10^5$	0.9977	0.0063	0.0125
248	C	Uniconazole	26.15	234(100)	236(40)	131(15)		0.1250 ~ 5.000	$Y = 1.23 \times 10^6X - 2.13 \times 10^5$	0.9983	0.0125	0.0250
249	C	Flusilazole	26.19	233(100)	206(33)	315(9)		0.1875 ~ 7.500	$Y = 4.23 \times 10^6X -1.07 \times 10^6$	0.9983	0.0188	0.0375
250	C	Fluorodifen	26.59	190(100)	328(35)	162(34)					0.0063	0.0125
251	C	Diniconazole	27.03	268(100)	270(65)	232(13)		0.1875 ~ 7.500	$Y = 1.62 \times 10^6X - 6.37 \times 10^5$	0.9936	0.0188	0.0375
252	C	Piperonyl butoxide	27.46	176(100)	177(33)	149(14)		0.0625 ~ 2.500	$Y = 3.50 \times 10^6X - 4.69 \times 10^5$	0.9919	0.0063	0.0125
253	C	Propargite	27.87	135(100)	350(7)	173(16)		0.1250 ~ 5.000	$Y = 1.43 \times 10^6X - 1.30 \times 10^5$	0.9995	0.0125	0.0250
254	C	Mepronil	27.91	119(100)	269(26)	120(9)		0.0625 ~ 2.500	$Y = 5.96 \times 10^6X - 6.83 \times 10^5$	0.9941	0.0063	0.0125
255	C	Dimefuron	27.82	140(100)	105(75)	267(36)		0.2500 ~ 10.00	$Y = 2.79 \times 10^5X - 1.10 \times 10^4$	0.9885	0.0250	0.0500
256	C	Diflufenican	28.45	266(100)	394(25)	267(14)		0.0625 ~ 2.500	$Y = 3.75 \times 10^6X - 4.25 \times 10^5$	0.9950	0.0063	0.0125
257	C	Fenazaquin	28.97	145(100)	160(46)	117(10)		0.0625 ~ 2.500	$Y = 5.25 \times 10^6X - 5.73 \times 10^5$	0.9950	0.0063	0.0125
258	C	Phenothrin	29.08	123(100)	183(74)	350(6)		0.0625 ~ 2.500	$Y = 2.13 \times 10^6X - 2.47 \times 10^5$	0.9950	0.0063	0.0125
			29.21									
259	C	Fludioxonil	28.93	248(100)	127(24)	154(21)		0.0625 ~ 2.500	$Y = 2.12 \times 10^6X - 2.08 \times 10^5$	0.9963	0.0063	0.0125
260	C	Fenoxycarb	29.57	255(100)	186(82)	116(93)		0.3750 ~ 15.00	$Y = 1.81 \times 10^5X + 1.11 \times 10^5$	0.9902	0.0375	0.0750
261	C	Sethoxydim	29.63	178(100)	281(51)	219(36)		0.5625 ~ 22.50	$Y = 2.11 \times 10^5X + 1.26 \times 10^5$	0.9868	0.0563	0.1125
262	C	Anilofos	30.68	226(100)	184(52)	334(10)		0.2500 ~ 5.000	$Y = 5.65 \times 10^5X - 1.83 \times 10^5$	0.9954	0.0250	0.0500
263	C	Acrinathrin	31.07	181(100)	289(31)	247(12)		0.1250 ~ 5.000	$Y = 1.21 \times 10^6X - 2.74 \times 10^5$	0.9939	0.0125	0.0250
264	C	lambda-Cyhalothrin	31.11	181(100)	197(100)	141(20)		0.0625 ~ 2.500	$Y = 1.83 \times 10^6X - 1.43 \times 10^5$	0.9982	0.0063	0.0125
265	C	Mefenacet	31.29	192(100)	120(35)	136(29)		0.1875 ~ 7.500	$Y = 2.02 \times 10^6X - 7.14 \times 10^5$	0.9928	0.0188	0.0375
266	C	Permethrin	31.57	183(100)	184(14)	255(1)		0.1250 ~ 5.000	$Y = 2.92 \times 10^6X - 5.21 \times 10^5$	0.9967	0.0125	0.0250
267	C	Pyridaben	31.86	147(100)	117(11)	364(7)		0.0625 ~ 2.500	$Y = 5.18 \times 10^6X - 4.92 \times 10^5$	0.9958	0.0063	0.0125
268	C	Fluoroglycofen-ethyl	32.01	447(100)	428(20)	449(35)		0.7500 ~ 30.00	$Y = 4.13 \times 10^5X - 8.77 \times 10^5$	0.9826	0.0750	0.1500
269	C	Bitertanol	32.25	170(100)	112(8)	141(6)		0.1875 ~ 7.500	$Y = 4.06 \times 10^6X - 1.42 \times 10^6$	0.9931	0.0188	0.0375
270	C	Etofenprox	32.75	163(100)	376(4)	183(6)		0.0625 ~ 2.500	$Y = 6.57 \times 10^6X - 3.60 \times 10^5$	0.9961	0.0063	0.0125
271	C	Cycloxydim	33.05	178(100)	279(7)	251(4)		0.7500 ~ 30.00	$Y = 7.64 \times 10^5X + 8.13 \times 10^5$	0.9907	0.0750	0.1500
272	C	alpha-Cypermethrin	33.35	163(100)	181(84)	165(63)		0.1250 ~ 5.000	$Y = 1.42 \times 10^6X - 2.51 \times 10^5$	0.9974	0.0125	0.0250
273	C	Flucythrinate	33.58	199(100)	157(90)	451(22)		0.1250 ~ 5.000	$Y = 9.93 \times 10^5X - 2.33 \times 10^5$	0.9903	0.0125	0.0250
			33.85									
274	C	Esfenvalerate	34.65	419(100)	225(158)	181(189)		0.2500 ~ 10.00	$Y = 3.68 \times 10^5X - 7.15 \times 10^4$	0.9983	0.0250	0.0500
275	C	Difenconazole	35.40	323(100)	325(66)	265(83)		0.3750 ~ 15.00	$Y = 1.08 \times 10^6X - 3.85 \times 10^5$	0.9860	0.0375	0.0750
276	C	Flumioxazin	35.50	354(100)	287(24)	259(15)					0.0125	0.0250
277	C	Flumiclorac-pentyl	36.34	423(100)	308(51)	318(29)		0.1250 ~ 5.000	$Y = 9.93 \times 10^5X - 2.33 \times 10^5$	0.9903	0.0125	0.0250

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
278	D	Dimefox	5.62	110(100)	154(75)	153(17)		0.1875 ~ 7.500	$Y = 1.34 \times 10^6X - 1.07 \times 10^5$	0.9992	0.0188	0.0375
279	D	Disulfoton-sulfoxide	8.41	212(100)	153(61)	184(20)		0.1250 ~ 5.000	$Y = 2.77 \times 10^5X - 2.21 \times 10^4$	0.9993	0.0125	0.0250
280	D	Pentachlorobenzene	11.11	250(100)	252(64)	215(24)		0.0625 ~ 2.500	$Y = 2.14 \times 10^6X - 3.01 \times 10^4$	0.9998	0.0063	0.0125
281	D	Tri-iso-butyl phosphate	11.65	155(100)	139(67)	211(24)					0.0063	0.0125
282	D	Crimidine	13.13	142(100)	156(90)	171(84)		0.0625 ~ 2.500	$Y = 1.32 \times 10^6X - 5.33 \times 10^4$	0.9987	0.0063	0.0125
283	D	BDMC-1	13.25	200(100)	202(104)	201(13)		0.2500 ~ 5.000	$Y = 2.00 \times 10^5X + 2.44 \times 10^4$	0.9978	0.0250	0.0500
284	D	Chlorfenprop-methyl	13.57	165(100)	196(87)	197(49)		0.0625 ~ 2.500	$Y = 1.34 \times 10^6X - 4.92 \times 10^4$	0.9989	0.0063	0.0125
285	D	Thionazin	14.04	143(100)	192(39)	220(14)		0.0625 ~ 2.500	$Y = 6.15 \times 10^5X - 3.47 \times 10^4$	0.9969	0.0063	0.0125
286	D	2,3,5,6-Tetrachloroaniline	14.22	231(100)	229(76)	158(25)		0.0625 ~ 2.500	$Y = 1.72 \times 10^6X - 5.14 \times 10^4$	0.9994	0.0063	0.0125
287	D	Tri-*n*-butyl phosphate	14.33	155(100)	211(61)	167(8)		0.1250 ~ 5.000	$Y = 1.40 \times 10^6X - 2.15 \times 10^5$	0.9972	0.0125	0.0250
288	D	2,3,4,5-Tetrachloroanisole	14.66	246(100)	203(70)	231(51)		0.0625 ~ 2.500	$Y = 1.11 \times 10^6X - 2.36 \times 10^4$	0.9997	0.0063	0.0125
289	D	Pentachloroanisole	15.19	280(100)	265(100)	237(85)		0.0625 ~ 2.500	$Y = 8.25 \times 10^5X - 1.64 \times 10^4$	0.9996	0.0063	0.0125
290	D	Tebutam	15.30	190(100)	106(38)	142(24)		0.1250 ~ 5.000	$Y = 1.22 \times 10^6X - 8.63 \times 10^4$	0.9990	0.0125	0.0250
291	D	Dioxabenzofos	16.14	216(100)	201(26)	171(5)		0.6250 ~ 25.00	$Y = 4.35 \times 10^5X - 2.36 \times 10^5$	0.9980	0.0625	0.1250
292	D	Methabenzthiazuron	16.34	164(100)	136(81)	108(27)		0.6250 ~ 25.00	$Y = 1.30 \times 10^6X - 1.65 \times 10^6$	0.9930	0.0625	0.1250
293	D	Simetone	16.69	197(100)	196(40)	182(38)		0.1250 ~ 5.000	$Y = 1.93 \times 10^6X - 2.26 \times 10^5$	0.9984	0.0125	0.0250
294	D	Atratone	16.70	196(100)	211(68)	197(105)		0.0625 ~ 2.500	$Y = 2.38 \times 10^6X - 1.24 \times 10^5$	0.9988	0.0063	0.0125
295	D	Desisopropyl-atrazine	16.69	173(100)	158(84)	145(73)		0.5000 ~ 20.00	$Y = 8.37 \times 10^5X - 4.16 \times 10^5$	0.9975	0.0500	0.1000
296	D	Terbufos sulfone	16.79	231(100)	288(11)	186(15)		0.0625 ~ 2.500	$Y = 2.08 \times 10^6X - 1.20 \times 10^5$	0.9980	0.0063	0.0125
297	D	Tefluthrin	17.24	177(100)	197(26)	161(5)		0.0625 ~ 2.500	$Y = 5.47 \times 10^6X - 2.89 \times 10^5$	0.9980	0.0063	0.0125
298	D	Bromocylen	17.43	359(100)	357(99)	394(14)		0.0625 ~ 2.500	$Y = 5.19 \times 10^5X - 2.05 \times 10^4$	0.9990	0.0063	0.0125
299	D	Trietazine	17.53	200(100)	229(51)	214(45)		0.0625 ~ 2.500	$Y = 2.17 \times 10^6X - 9.66 \times 10^4$	0.9987	0.0063	0.0125
300	D	Etrimfos oxon	17.83	292(100)	277(35)	263(12)		0.0625 ~ 2.500	$Y = 4.07 \times 10^6X - 1.85 \times 10^5$	0.9990	0.0063	0.0125
301	D	Cycluron	17.95	89(100)	198(36)	114(9)		0.1875 ~ 7.500	$Y = 6.73 \times 10^5X - 1.27 \times 10^5$	0.9982	0.0188	0.0375
302	D	2,6-Dichlorobenzamide	17.93	173(100)	189(36)	175(62		0.1250 ~ 5.000	$Y = 1.57 \times 10^6X - 1.74 \times 10^5$	0.9983	0.0125	0.0250
303	D	DE-PCB 28	18.15	256(100)	186(53)	258(97)		0.0625 ~ 1.250	$Y = 5.60 \times 10^6X - 5.83 \times 10^4$	0.9997	0.0063	0.0125
304	D	DE-PCB 31	18.19	256(100)	186(53)	258(97)		0.0625 ~ 1.250	$Y = 5.45 \times 10^6X - 5.64 \times 10^4$	0.9997	0.0063	0.0125
305	D	Desethyl-sebuthylazine	18.32	172(100)	174(32)	186(11)		0.1250 ~ 5.000	$Y = 3.58 \times 10^6X - 3.93 \times 10^5$	0.9985	0.0125	0.0250
306	D	2,3,4,5-Tetrachloroaniline	18.55	231(100)	229(76)	233(48)		0.1250 ~ 5.000	$Y = 1.61 \times 10^6X - 1.25 \times 10^5$	0.9989	0.0125	0.0250
307	D	Musk ambrette	18.62	253(100)	268(35)	223(18)					0.0063	0.0125
308	D	Musk xylene	18.66	282(100)	297(10)	128(20)					0.0063	0.0125
309	D	Pentachloroaniline	18.91	265(100)	263(63)	230(8)		0.0625 ~ 2.500	$Y = 1.63 \times 10^6X - 5.38 \times 10^4$	0.9990	0.0063	0.0125
310	D	Aziprotryne	19.11	199(100)	184(83)	157(31)		0.5000 ~ 20.00	$Y = 4.43 \times 10^5X - 1.80 \times 10^5$	0.9979	0.0500	0.1000
311	D	Sebutylazine	19.26	200(100)	214(14)	229(13)		0.0625 ~ 2.500	$Y = 3.74 \times 10^6X - 1.70 \times 10^5$	0.9989	0.0063	0.0125
312	D	Isocarbamid	19.24	142(100)	185(2)	143(6)		0.3125 ~ 12.50	$Y = 2.55 \times 10^6X - 9.72 \times 10^5$	0.9965	0.0313	0.0625
313	D	DE-PCB 52	19.48	292(100)	220(88)	255(32)		0.0625 ~ 2.500	$Y = 1.92 \times 10^6X - 3.05 \times 10^4$	0.9997	0.0063	0.0125
314	D	Musk moskene	19.46	263(100)	278(12)	264(15)					0.0063	0.0125
315	D	Prosulfocarb	19.51	251(100)	252(14)	162(10)		0.0625 ~ 2.500	$Y = 1.04 \times 10^6X - 5.13 \times 10^4$	0.9988	0.0063	0.0125
316	D	Dimethenamid	19.55	154(100)	230(43)	203(21)		0.0625 ~ 2.500	$Y = 3.66 \times 10^6X - 1.48 \times 10^5$	0.9990	0.0063	0.0125
317	D	Fenchlorphos oxon	19.72	285(100)	287(70)	270(7)		0.1250 ~ 5.000	$Y = 2.18 \times 10^6X - 1.77 \times 10^5$	0.9991	0.0125	0.0250
318	D	BDMC-2	19.74	200(100)	202(101)	201(12)		0.1250 ~ 5.000	$Y = 1.46 \times 10^6X - 3.49 \times 10^5$	0.9912	0.0125	0.0250

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
319	D	Paraoxon-methyl	19.83	230(100)	247(93)	200(40)		0.5000 ~ 5.000	$Y = 3.57 \times 10^5X - 2.04 \times 10^5$	0.9852	0.0500	0.1000
320	D	Monalide	20.02	197(100)	199(31)	239(45)		0.1250 ~ 5.000	$Y = 7.65 \times 10^5X - 5.97 \times 10^4$	0.9988	0.0125	0.0250
321	D	Musk tibeten	20.40	251(100)	266(25)	252(14)					0.0063	0.0125
322	D	Isobenzan	20.55	311(100)	375(31)	412(7)		0.0625 ~ 2.500	$Y = 5.29 \times 10^5X - 1.51 \times 10^4$	0.9995	0.0063	0.0125
323	D	Octachlorostyrene	20.60	380(100)	343(94)	308(120)		0.0625 ~ 2.500	$Y = 6.84 \times 10^5X - 1.55 \times 10^4$	0.9997	0.0063	0.0125
324	D	Pyrimitate	20.59	305(100)	153(116)	180(49)					0.0063	0.0125
325	D	Isodrin	21.01	193(100)	263(46)	195(83)		0.0625 ~ 2.500	$Y = 7.73 \times 10^5X - 9.06 \times 10^3$	0.9982	0.0063	0.0125
326	D	Isomethiozin	21.06	225(100)	198(86)	184(13)		0.1250 ~ 5.000	$Y = 1.60 \times 10^6X - 2.21 \times 10^5$	0.9970	0.0125	0.0250
327	D	Trichloronat	21.10	297(100)	269(86)	196(16)		0.0625 ~ 2.500	$Y = 1.49 \times 10^6X - 6.67 \times 10^4$	0.9989	0.0063	0.0125
328	D	Dacthal	21.25	301(100)	332(31)	221(16)		0.0625 ~ 2.500	$Y = 4.04 \times 10^6X - 1.08 \times 10^5$	0.9995	0.0063	0.0125
329	D	4,4-Dichlorobenzophenone	21.29	250(100)	252(62)	215(26)		0.0625 ~ 2.500	$Y = 1.13 \times 10^6X - 9.71 \times 10^4$	0.9959	0.0063	0.0125
330	D	Nitrothal-isopropyl	21.69	236(100)	254(54)	212(74)		0.1250 ~ 5.000	$Y = 1.80 \times 10^6X - 4.91 \times 10^5$	0.9911	0.0125	0.0250
331	D	Musk ketone	21.70	279(100)	294(28)	128(16)					0.0063	0.0125
332	D	Rabenzazole	21.73	212(100)	170(26)	195(19)		0.0625 ~ 2.500	$Y = 5.20 \times 10^6X - 6.05 \times 10^5$	0.9931	0.0063	0.0125
333	D	Cyprodinil	21.94	224(100)	225(62)	210(9)		0.0625 ~ 2.500	$Y = 5.21 \times 10^6X - 3.06 \times 10^5$	0.9977	0.0063	0.0125
334	D	Fuberidazole	22.10	184(100)	155(21)	129(12)					0.0313	0.0625
335	D	Isofenphos oxon	22.04	229(100)	201(2)	314(12)					0.0125	0.0250
336	D	Dicapthon	22.44	262(100)	263(10)	216(10)		0.3125 ~ 12.50	$Y = 1.75 \times 10^6X - 1.05 \times 10^6$	0.9946	0.0313	0.0625
337	D	DE-PCB 101	22.62	326(100)	254(66)	291(18)		0.0625 ~ 2.500	$Y = 1.74 \times 10^6X - 3.67 \times 10^4$	0.9994	0.0063	0.0125
338	D	MCPA-butoxyethyl ester	22.61	300(100)	200(71)	182(41)		0.0625 ~ 2.500	$Y = 6.47 \times 10^5X - 4.71 \times 10^4$	0.9966	0.0063	0.0125
339	D	Isocarbophos	22.87	136(100)	230(26)	289(22)					0.0125	0.0250
340	D	Phorate sulfone	23.15	199(100)	171(30)	215(11)		0.0625 ~ 2.500	$Y = 8.24 \times 10^5X - 5.08 \times 10^4$	0.9946	0.0063	0.0125
341	D	Chlorfenethol	23.29	251(100)	253(66)	266(12)		0.0625 ~ 2.500	$Y = 2.04 \times 10^6X - 1.30 \times 10^5$	0.9975	0.0063	0.0125
342	D	*trans*-Nonachlor	23.62	409(100)	407(89)	411(63)		0.0625 ~ 2.500	$Y = 1.13 \times 10^6X - 3.81 \times 10^4$	0.9990	0.0063	0.0125
343	D	Dinobuton	23.88	211(100)	240(15)	223(15)		1.250 ~ 25.00	$Y = 5.32 \times 10^5X - 1.34 \times 10^6$	0.9788	0.1250	0.2500
344	D	DEF	24.08	202(100)	226(51)	258(55)		0.1250 ~ 5.000	$Y = 7.30 \times 10^5X - 1.05 \times 10^5$	0.9971	0.0125	0.0250
345	D	Flurochloridone	24.31	311(100)	187(74)	313(66)		0.1250 ~ 5.000	$Y = 1.26 \times 10^6X - 1.66 \times 10^5$	0.9979	0.0125	0.0250
346	D	Bromfenvinfos	24.62	267(100)	323(56)	295(18)		0.0625 ~ 2.500	$Y = 1.20 \times 10^6X - 1.00 \times 10^5$	0.9937	0.0063	0.0125
347	D	Perthane	24.81	223(100)	224(20)	178(9)		0.0625 ~ 2.500	$Y = 7.03 \times 10^6X - 3.66 \times 10^5$	0.9974	0.0063	0.0125
348	D	Ditalimfos	24.82	130(100)	148(43)	299(34)		0.0625 ~ 2.500	$Y = 2.75 \times 10^6X - 1.67 \times 10^5$	0.9976	0.0063	0.0125
349	D	DE-PCB 118	25.08	326(100)	254(38)	184(16)		0.0625 ~ 2.500	$Y = 2.10 \times 10^6X - 6.14 \times 10^4$	0.9985	0.0063	0.0125
350	D	4,4-Dibromobenzophenone	25.30	340(100)	259(30)	185(179)		0.1250 ~ 2.500	$Y = 5.97 \times 10^5X - 7.56 \times 10^4$	0.9945	0.0125	0.0250
351	D	Flutriafol	25.31	219(100)	164(96)	201(7)		0.1250 ~ 5.000	$Y = 1.40 \times 10^6X - 1.75 \times 10^5$	0.9985	0.0125	0.0250
352	D	Mephosfolan	25.29	196(100)	227(49)	168(60)		0.1250 ~ 5.000	$Y = 9.51 \times 10^5X - 2.57 \times 10^5$	0.9890	0.0125	0.0250
353	D	Athidathion	25.63	145(100)	330(1)	129(12)		0.1250 ~ 5.000	$Y = 1.88 \times 10^5X - 5.69 \times 10^3$	0.9995	0.0125	0.0250
354	D	DE-PCB 153	25.64	360(100)	290(62)	218(24)		0.0625 ~ 2.500	$Y = 1.60 \times 10^6X - 4.19 \times 10^4$	0.9992	0.0063	0.0125
355	D	Diclobutrazole	25.95	270(100)	272(68)	159(42)		0.2500 ~ 10.00	$Y = 1.90 \times 10^6X - 5.90 \times 10^5$	0.9957	0.0250	0.0500
356	D	Disulfoton sulfone	26.16	213(100)	229(4)	185(11)		0.1250 ~ 5.000	$Y = 1.39 \times 10^6X - 1.94 \times 10^5$	0.9966	0.0125	0.0250
357	D	Hexythiazox	26.48	227(100)	156(158)	184(93)		0.500 ~ 20.00	$Y = 3.00 \times 10^5X - 1.65 \times 10^5$	0.9981	0.0500	0.1000
358	D	DE-PCB 138	26.84	360(100)	290(68)	218(26)		0.0625 ~ 2.500	$Y = 1.31 \times 10^6X - 3.38 \times 10^4$	0.9991	0.0063	0.0125
359	D	Triamiphos	27.02	160(100)	294(28)	251(16)					0.0125	0.0250

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
360	D	Resmethrin-1	27.26	171(100)	143(83)	338(7)		0.1250 ~ 5.000	$Y = 2.98 \times 10^5X - 1.11 \times 10^4$	0.9823	0.0125	0.0250
361	D	Cyproconazole	27.23	222(100)	224(35)	223(11)		0.0625 ~ 2.500	$Y = 1.31 \times 10^6X - 6.22 \times 10^4$	0.9983	0.0063	0.0125
362	D	Resmethrin-2	27.43	171(100)	143(80)	338(7)		0.1250 ~ 5.000	$Y = 7.98 \times 10^5X - 1.33 \times 10^5$	0.9953	0.0125	0.0250
363	D	Phthalic acid,benzyl butyl ester	27.56	206(100)	312(4)	230(1)		0.0625 ~ 2.500	$Y = 8.67 \times 10^5X - 4.54 \times 10^4$	0.9973	0.0063	0.0125
364	D	Clodinafop-propargyl	27.74	349(100)	238(96)	266(83)		0.1250 ~ 5.000	$Y = 9.81 \times 10^5X - 3.07 \times 10^5$	0.9820	0.0125	0.0250
365	D	Fenthion sulfoxide	28.06	278(100)	279(290)	294(145)		0.2500 ~ 5.000	$Y = 2.45 \times 10^5X - 1.08 \times 10^5$	0.9863	0.0250	0.0500
366	D	Fluotrimazole	28.39	311(100)	379((60)	233(36)		0.0625 ~ 2.500	$Y = 1.55 \times 10^6X - 5.73 \times 10^4$	0.9981	0.0063	0.0125
367	D	Fluroxypr-1-methylheptyl ester	28.45	366(100)	254(67)	237(60)		0.1250 ~ 2.500	$Y = 3.14 \times 10^5X - 2.20 \times 10^4$	0.9974	0.0125	0.0250
368	D	Fenthion sulfone	28.55	310(100)	136(25)	231(10)		0.2500 ~ 10.00	$Y = 4.68 \times 10^5X + 1.45 \times 10^5$	0.9839	0.0250	0.0500
369	D	Triphenyl phosphate	28.65	326(100)	233(16)	215(20)		0.0625 ~ 2.500	$Y = 2.59 \times 10^6X - 6.86 \times 10^4$	0.9990	0.0063	0.0125
370	D	Metamitron	28.63	202(100)	174(52)	186(12)		2.500 ~ 25.00	$Y = 4.59 \times 10^4X - 4.78 \times 10^4$	0.9994	0.2500	0.5000
371	D	DE-PCB 180	29.05	394(100)	324(70)	359(20)		0.0625 ~ 2.500	$Y = 1.16 \times 10^6X - 3.07 \times 10^4$	0.9989	0.0063	0.0125
372	D	Tebufenpyrad	29.06	318(100)	333(78)	276(44)		0.0625 ~ 2.500	$Y = 1.69 \times 10^6X - 8.49 \times 10^4$	0.9965	0.0063	0.0125
373	D	Cloquintocet-mexyl	29.32	192(100)	194(32)	220(4)		0.0625 ~ 2.500	$Y = 4.90 \times 10^6X - 4.73 \times 10^5$	0.9915	0.0063	0.0125
374	D	Lenacil	29.70	153(100)	136(6)	234(2)		0.6250 ~ 25.00	$Y = 1.31 \times 10^6X - 7.83 \times 10^5$	0.9967	0.0063	0.0125
375	D	Bromuconazole-1	29.90	173(100)	175(65)	214(15)		0.1250 ~ 5.000	$Y = 4.45 \times 10^5X + 7.05 \times 10^3$	0.9916	0.0125	0.0250
376	D	Desbrom-leptophos	30.15	377(100)	171(97)	375(72)		0.0625 ~ 2.500	$Y = 9.66 \times 10^5X - 3.34 \times 10^4$	0.9990	0.0063	0.0125
377	D	Bromuconazole-2	30.72	173(100)	175(67)	214(14)		0.1250 ~ 2.500	$Y = 7.98 \times 10^5X - 5.29 \times 10^4$	0.9994	0.0125	0.0250
378	D	Nitralin	30.92	316(100)	274(58)	300(15)		0.6250 ~ 25.00	$Y = 1.35 \times 10^6X - 1.87 \times 10^6$	0.9907	0.0625	0.1250
379	D	Fenamiphos sulfoxide	31.03	304(100)	319(29)	196(22)		0.2500 ~ 10.00	$Y = 3.38 \times 10^5X - 2.60 \times 10^3$	0.9561	0.0250	0.0500
380	D	Fenamiphos sulfone	31.34	320(100)	292(57)	335(7)		0.2500 ~ 10.00	$Y = 2.06 \times 10^6X - 7.52 \times 10^5$	0.9954	0.0250	0.0500
381	D	Fenpiclonil	32.37	236(100)	238(66)	174(36)		0.2500 ~ 10.00	$Y = 1.72 \times 10^6X - 2.58 \times 10^5$	0.9981	0.0250	0.0500
382	D	Fluquinconazole	32.62	340(100)	342(37)	341(20)		0.0625 ~ 2.500	$Y = 3.40 \times 10^6X - 1.22 \times 10^4$	0.9991	0.0063	0.0125
383	D	Fenbuconazole	34.02	129(100)	198(51)	125(31)		0.1250 ~ 5.000	$Y = 2.96 \times 10^6X + 9.45 \times 10^5$	0.9896	0.0125	0.0250
384	E	Aminocarb	2.35	209/137; 209/152	209/137	50	18; 20	0.0080 ~ 1.600	$Y = 1.10 \times 10^4X - 9.02 \times 10^1$	0.9992	0.0020	0.0040
385	E	Acephate	2.72	201/184; 201/143	201/143	26	32; 32	0.1600 ~ 32.00	$Y = 1.05 \times 10^3X + 1.06 \times 10^4$	0.9995	0.0100	0.0200
386	E	Omethoate	2.82	214/183; 214/155	214/183	45	30; 60	0.1200 ~ 24.00	$Y = 1.36 \times 10^3X + 4.78 \times 10^2$	0.9996	0.0060	0.0120
387	E	Propamocarb	1.89	190/102; 190/74	190/102	65	16; 24	0.2000 ~ 40.00	$Y = 5.55 \times 10^2X - 1.33 \times 10^3$	0.9995	0.0250	0.0500
388	E	Butocarboxim-sulfoxide	2.78	207/132; 207/88	207/132	60	19; 9	0.0800 ~ 16.00	$Y = 2.16 \times 10^3X + 3.67 \times 10^3$	0.9992	0.0050	0.0100
389	E	Demeton-*s*-methyl sulfoxide	3.40	247/169; 247/105	247/169	50	18; 23	0.0320 ~ 6.400	$Y = 4.78 \times 10^3X + 7.50 \times 10^3$	0.9991	0.0200	0.0400
390	E	Monocrotophos	3.87	224/193; 224/127	224/193	55	27; 40	0.0400 ~ 8.000	$Y = 7.71 \times 10^3X + 6.69 \times 10^3$	0.9999	0.0050	0.0100
391	E	Butoxycarboxim	3.74	223/106; 223/166	223/106	50	11; 16	0.1600 ~ 32.00	$Y = 2.10 \times 10^3X + 7.00 \times 10^3$	0.9998	0.0100	0.0200
392	E	Oxamyl	3.99	242/72; 242/121	242/72	65	21; 19	0.0600 ~ 1.200	$Y = 2.83 \times 10^3X + 6.41 \times 10^3$	0.9990	0.0150	0.0300
393	E	Thiofanox-sulfoxide	5.68	235/104; 235/178	235/104	40	12; 22	0.1200 ~ 24.00	$Y = 1.20 \times 10^3X + 3.01 \times 10^3$	0.9991	0.0060	0.0120
394	E	Demeton-*s*-methyl sulfone	5.13	263/169; 263/127	263/169	60	15; 12	0.0200 ~ 2.000	$Y = 5.56 \times 10^3X + 4.28 \times 10^3$	0.9992	0.0050	0.0100
395	E	Methomyl	4.77	163/88; 163/106	163/106	60	35; 19	0.2000 ~ 10.00	$Y = 1.09 \times 10^3X + 2.26 \times 10^3$	0.9991	0.0250	0.0500
396	E	Vamidothion	6.46	288/146; 288/118	288/146	70	13; 25	0.0120 ~ 2.400	$Y = 2.22 \times 10^4X + 6.33 \times 10^3$	0.9991	0.0030	0.0060
397	E	Metamitron	7.41	203/175; 203/104	203/175	65	14; 10	0.0120 ~ 2.400	$Y = 8.56 \times 10^3X + 7.12 \times 10^2$	0.9997	0.0100	0.0200
398	E	3-Hydroxy carbofuran	7.94	238/163; 238/220	238/163	45	23; 37	0.0200 ~ 4.000	$Y = 3.98 \times 10^3X + 2.05 \times 10^3$	0.9993	0.0050	0.0100
399	E	Ethiofencarb-sulfone	7.77	258/107; 258/201	258/107	45	15; 15	0.0160 ~ 3.200	$Y = 8.03 \times 10^3X + 6.96 \times 10^2$	0.9990	0.0400	0.0800
400	E	Imidacloprid	8.67	256/209; 256/175	256/209	55	20; 34	0.0200 ~ 4.000	$Y = 4.42 \times 10^3X + 5.67 \times 10^2$	0.9993	0.0100	0.0200

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
401	E	Pirimicarb	8.26	239/182; 239/72	239/182	60	25; 35	0.0060 ~ 1.200	$Y = 2.14 \times 10^4X + 2.66 \times 10^3$	0.9994	0.0015	0.0030
402	E	Thiofanox-sulfone	9.97	251/57; 251.3/76	251/57	65	21; 9	0.0200 ~ 4.000	$Y = 5.22 \times 10^3X + 7.06 \times 10^2$	0.9991	0.0100	0.0200
403	E	Dimethoate	9.65	230/199; 230/125	230/199	65	26; 11	0.0120 ~ 2.400	$Y = 1.47 \times 10^4X + 4.50 \times 10^3$	0.9990	0.0030	0.0060
404	E	Butocarboxim	12.33	213/75; 213/156	213/75	60	23; 28	0.0800 ~ 16.00	$Y = 2.16 \times 10^3X + 3.67 \times 10^3$	0.9992	0.0200	0.0400
405	E	Triacloprid	12.96	253/126; 253/186	253/126	65	25; 40	0.0060 ~ 1.200	$Y = 9.50 \times 10^3X + 5.24 \times 10^2$	0.9998	0.0030	0.0060
406	E	Aldicarb	13.42	208/116; 208/109	208/116	60	22; 46	0.1600 ~ 16.00	$Y = 1.99 \times 10^3X + 6.33 \times 10^3$	0.9991	0.0200	0.0400
407	E	Imazalil	11.67	297/159; 297/173	297/159	65	23; 11	0.0320 ~ 6.400	$Y = 6.34 \times 10^3X + 1.60 \times 10^3$	0.9991	0.0080	0.0160
408	E	Demeton-*s*-methyl	15.93	231/89; 231/175	231/89	55	15; 31	0.0320 ~ 6.400	$Y = 4.78 \times 10^3X + 7.50 \times 10^3$	0.9991	0.0100	0.0200
409	E	Propoxur	17.14	210/111; 210/168	210/111	65	50; 50	0.0160 ~ 3.200	$Y = 1.48 \times 10^4X - 8.33 \times 10^2$	0.9991	0.0080	0.0160
410	E	Dioxacarb	17.46	224/167; 224/123	224/167	45	23; 16	0.0040 ~ 0.080	$Y = 2.83 \times 10^6X - 2.22 \times 10^4$	0.9990	0.0002	0.0004
411	E	Thiodicarb	17.17	355/88; 355/108	355/88	65	32; 21	0.0200 ~ 4.000	$Y = 4.50 \times 10^3X + 2.60 \times 10^3$	0.9991	0.0250	0.0500
412	E	Bendiocarb	17.44	224/109; 224/167	224/109	45	11; 8	0.0800 ~ 16.00	$Y = 1.12 \times 10^4X - 1.30 \times 10^4$	0.9997	0.0100	0.0200
413	E	Carbofuran	17.48	222/165; 222/123	222/165	70	37; 35	0.0040 ~ 0.800	$Y = 3.35 \times 10^4X + 1.92 \times 10^3$	0.9990	0.0050	0.0100
414	E	Carbaryl	18.48	202/145; 202/117	202/145	65	20; 11	0.0200 ~ 4.000	$Y = 8.41 \times 10^3X + 3.31 \times 10^3$	0.9996	0.0100	0.0200
415	E	Fosthiazate	18.79	284/228; 284/104	284/228	45	22; 22	0.0080 ~ 1.600	$Y = 1.67 \times 10^4X + 2.67 \times 10^3$	0.9990	0.0020	0.0040
416	E	Atrazine	18.88	216/174; 216/132	216/174	50	29; 15	0.0240 ~ 4.800	$Y = 4.18 \times 10^3X + 1.23 \times 10^3$	0.9994	0.0030	0.0060
417	E	Fenpropimorph	14.78	305/148; 305/130	305/148	80	13; 24	0.0240 ~ 4.800	$Y = 3.79 \times 10^3X - 1.13 \times 10^3$	0.9920	0.0120	0.0240
418	E	Pyrimethanil	19.33	200/107; 200/182	200/107	70	18; 31	0.0160 ~ 3.200	$Y = 6.64 \times 10^3X - 1.10 \times 10^2$	0.9992	0.0080	0.0160
419	E	Ethiofencarb	19.21	226/107; 226/164	226/107	60	23; 27	0.0320 ~ 1.600	$Y = 7.33 \times 10^3X + 2.68 \times 10^3$	0.9990	0.0040	0.0080
420	E	Metalaxyl	19.25	280/220; 280/192	280/220	45	22; 13	0.0040 ~ 0.800	$Y = 2.09 \times 10^4X + 1.89 \times 10^3$	0.9993	0.0010	0.0020
421	E	Isoproturon	19.25	207/165; 207/71	207/165	60	24; 14	0.0200 ~ 4.000	$Y = 4.52 \times 10^3X + 2.60 \times 10^3$	0.9991	0.0050	0.0100
422	E	Spiroxamine	14.55	298/144; 298/100	298/144	45	26; 26	0.0020 ~ 0.400	$Y = 6.15 \times 10^4X + 1.33 \times 10^3$	0.9993	0.0005	0.0010
423	E	Diuron	19.39	233/72; 233/160	233/72	55	26; 30	0.0200 ~ 2.000	$Y = 4.61 \times 10^3X + 1.90 \times 10^3$	0.9990	0.0050	0.0100
424	E	Isoprocarb	20.04	194/94; 194/137	194/94	45	31; 22	0.2000 ~ 40.00	$Y = 8.90 \times 10^2X + 1.02 \times 10^3$	0.9998	0.0250	0.0500
425	E	3,4,5-Trimethacarb	20.05	194/137; 194/122	194/137	50	30; 21	0.0160 ~ 3.200	$Y = 1.67 \times 10^4X + 3.14 \times 10^2$	0.9990	0.0008	0.0016
426	E	Methiocarb	21.85	318/182; 318/301	318/182	45	15; 27	0.0120 ~ 2.400	$Y = 1.33 \times 10^4X - 2.86 \times 10^3$	0.9990	0.0060	0.0120
427	E	Phenmedipham	21.85	301/168; 301/136	301/168	70	23; 18	0.0120 ~ 0.600	$Y = 8.89 \times 10^3X - 4.05 \times 10^3$	0.9991	0.0030	0.0060
428	E	Desmedipham	21.94	226/169; 226/121	226/169	60	18; 35	0.0120 ~ 0.600	$Y = 4.18 \times 10^3X - 2.18 \times 10^3$	0.9996	0.0030	0.0060
429	E	Linuron	22.29	249/160; 249/182	249/160	45	26; 36	0.0320 ~ 6.400	$Y = 4.58 \times 10^3X + 2.48 \times 10^3$	0.9991	0.0080	0.0160
430	E	Cyprodinil	22.86	404/372; 404/344	404/372	45	21; 40	0.0160 ~ 3.200	$Y = 6.67 \times 10^3X + 1.48 \times 10^3$	0.9996	0.0080	0.0160
431	E	Promecarb	22.94	226/93; 226/118	226/93	50	40; 35	0.0200 ~ 2.000	$Y = 9.86 \times 10^3X + 1.92 \times 10^3$	0.9992	0.0050	0.0100
432	E	Iprovalicarb	22.62	208/109; 208/152	208/109	65	37; 43	0.0160 ~ 3.200	$Y = 5.44 \times 10^3X + 1.38 \times 10^3$	0.9994	0.0010	0.0020
433	E	Isoxaflutole	22.68	321/203; 321/119	321/203	45	23; 13	0.0800 ~ 1.600	$Y = 6.08 \times 10^2X + 3.60 \times 10^2$	0.9997	0.0200	0.0400
434	E	Azoxystrobin	22.75	360/251; 360/220	360/251	55	21; 27	0.0020 ~ 0.400	$Y = 2.79 \times 10^4X + 5.33 \times 10^2$	0.9992	0.0005	0.0010
435	E	Tebuconazole	23.73	308/70; 308/125	308/70	45	32; 45	0.0040 ~ 0.800	$Y = 1.65 \times 10^4X + 1.72 \times 10^3$	0.9990	0.0020	0.0040
436	E	Primisulfuron-methyl	23.83	469/254; 469/199	469/254	45	40; 40	0.2000 ~ 40.00	$Y = 1.45 \times 10^2X - 8.56 \times 10^1$	0.9991	0.0150	0.0300
437	E	Metolachlor	24.62	302/116; 302/256	302/116	60	18; 37	0.0040 ~ 0.800	$Y = 2.31 \times 10^4X + 1.11 \times 10^3$	0.9990	0.0030	0.0060
438	E	Fenoxycarb	24.73	284/252; 284/176	284/252	45	23; 23	0.0200 ~ 4.000	$Y = 6.47 \times 10^3X + 1.7 \times 10^3$	0.9992	0.0050	0.0100
439	E	Tebufenozide	25.49	353/133; 353/297	353/133	65	25; 21	0.0040 ~ 0.800	$Y = 3.10 \times 10^4X - 9.55 \times 10^2$	0.9990	0.0020	0.0040
440	E	Haloxyfop-methyl	28.29	376/316; 376/91	376/316	50	23; 23	0.0080 ~ 1.600	$Y = 9.15 \times 10^3X + 3.75 \times 10^3$	0.9997	0.0040	0.0080
441	E	Indoxacarb	28.52	528/249; 528/293	528/249	45	15; 27	0.0400 ~ 8.000	$Y = 2.44 \times 10^3X + 1.13 \times 10^3$	0.9993	0.0100	0.0200

Table 2. (*continued*)

No.	Group	Pesticide	Retention time, min	Quantification ion[a]	Qalification ion 1[a]	Qualification ion 2[a]	Qualification ion 3[a]	Linear range, ng	Linear equation	Correlation coefficient (r)	LOD, mg/kg	LOQ, mg/kg
442	E	Quizalofop-ethyl	29.05	373/299; 373/271	373/299	55	15; 30	0.0080 ~ 1.600	$Y = 1.36 \times 10^4X - 8.92 \times 10^2$	0.9994	0.0020	0.0040
443	E	Haloxyfop-2-ethoxyethyl	29.58	434/316; 434/117	434/316	50	22; 12	0.0160 ~ 3.200	$Y = 6.09 \times 10^3X - 2.14 \times 10^2$	0.9991	0.0040	0.0080
444	E	Furathiocarb	30.26	383/195; 383/252	383/195	80	12; 33	0.0040 ~ 0.800	$Y = 1.60 \times 10^4X + 5.73 \times 10^2$	0.9990	0.0020	0.0040
445	E	Fluazifop-butyl	30.76	384/328; 384/282	384/328	80	27; 27	0.0080 ~ 0.400	$Y = 1.14 \times 10^4X - 1.80 \times 10^3$	0.9991	0.0040	0.0080
446	E	Flufenoxuron	31.00	489/158; 489/141	489/158	80	50; 43	0.0080 ~ 0.400	$Y = 6.59 \times 10^3X - 9.78 \times 10^2$	0.9991	0.0400	0.0800

[a] The value in paretheses is the relative abundance.

Table 3. Mobile phase program and flow rate

Time, min	Flow rate, μL/min	Water, %	Acetonitrile, %
0.00	200	70.0	30.0
10.00	200	60.0	40.0
15.00	200	40.0	60.0
30.00	200	5.0	95.0
40.00	200	5.0	95.0
40.01	200	70.0	30.0
55.00	200	70.0	30.0

and pyrethroide pesticides in fruits and vegetables by GC/MS/MS.

Recently, much attention has been given to the use of acetonitrile as a pesticide residue extraction solvent. Liao et al. (16) utilized extraction of pesticide residues with acetonitrile and salting out with sodium chloride, and they determined 143 pesticides using GC/MS to split into groups after dehydration. Lehotay et al. (17–19) conducted a systematic study on establishing a QuEChERS (quick, easy, cheap, effective, rugged, and safe) method. Extraction of pesticide residues was done with acetonitrile, salting out with $MgSO_4$ and NaCl, dispersive SPE with PSA (primary secondary amine) sorbent for cleanup, and GC/MS and LC/MS/MS for determination of 229 pesticides in food. Fillion et al. (20–22) analyzed 251 pesticide residues by use of an SPE cartridge for cleanup and LC. Ueno et al. (23–25) also used the previous treatment system but with addition of GPC for cleanup, and the established 3 multiresidue methods for determination of 58–87 pesticides using GC with multiple detectors.

In the past, Pang and coworkers developed 5 multiresidue methods for pyrethroid pesticides that utilized, respectively acetone–petroleum ether (26, 27), methanol (28, 29), acetone and acetonitrile (30) as extraction solvents; Florisil column cleanup; and GC–ECD, GC–MSD, and LC with an ultraviolet detecter (LC-UV) for determination of 8–11 pyrethroids pesticide residues in agricultural products. The fifth method underwent an interlaboratory collaborative study, participated in by 14 laboratories from 6 countries, that was successful and led to establishment of an AOAC Official Method (30).

On the basis of the study of Fillion et al. (22), we have made appropriate modifications to the extraction and cleanup procedures and at the same time conducted a detailed study of the interferences among the product ions of more than 400 pesticides, with a new analysis mode proposed having the name "Sequential Detection Based on Time Frame and Groups." The objective achieved is that as long as the target pesticide was applicable to such an extraction and cleanup system, the number of pesticide varieties for simultaneous determination can increase without limit, thus making the multiresidue analysis operate as easily as single residue analysis. Tests proved that the method has good selectivity, relatively high sensitivity, and wide application scope, and it is suitable for the simultaneous determination of residues of 446 pesticides with samples processed only once. Presently, this method has been adopted as the national standard of the P.R. China and it is widely used for residue monitoring of 446 pesticides in more than 20 fruits and vegetables, such as apples, pears, oranges, bananas, grapes, pineapples, kiwi, cabbage, tomatoes, cucumbers, green peppers, spinach, cauliflower, celery, string beans, carrots, potatoes, lettuce, etc.

Experimental

Reagents and Materials

(**a**) *Solvents*.—LC grade acetonitrile and methanol; pesticide grade toluene, acetone, dichloromethane, *n*-hexane, and acetic acid.

(**b**) *Sodium sulfate anhydrous*.—Heated to 650°C for 4 h and keep in a desiccator.

(**c**) *Envi-18 SPE cartridges*.—12 mL/2.0 g, Supelco No. 57114 (State College, PA).

(**d**) *Envi-carb SPE cartridges*.—6 mL/0.5 g, Supelco No. 57094.

(**e**) *Aminopropyl Sep-Pak vac cartridges*.—3 mL/0.5 g, Waters No. WAT020840 (Milford, MA).

(**f**) *Pesticide standard.*—Purity ≥95% (LGC Promochem, Wesel, Germany).

(**g**) *Stock standard solutions*.—Accurately weigh 5–10 mg of individual pesticide standards (accurate to 0.1 mg) into a 10 mL volumetric flask. Dissolve and dilute to volume with toluene, toluene + acetone combination, dichloromethane, methanol, etc., depending upon the solubility of each individual compound solubility.

(**h**) *Standard mixture solutions.*—Pesticides are split into 5 different mixed standard solutions, A–E, based upon their properties and retention times. The concentration of each analyte is determined by its sensitivity on the instrument used for analysis. Standard mixtures A–D are prepared in toluene for GC/MS determination, and standard mixture E is prepared in methanol for LC/MS/MS determination. All standard mixtures are stored in the dark at 4°C and can be used for 1 month.

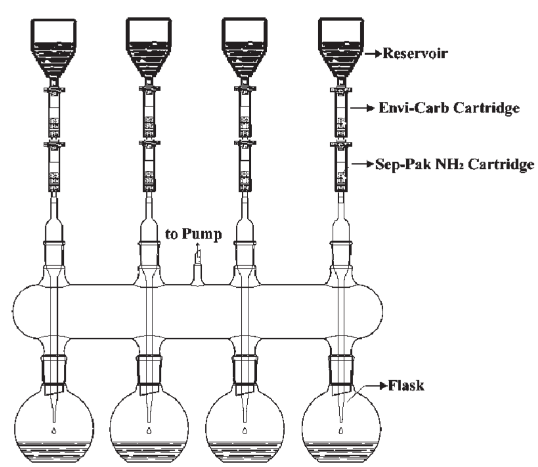

Figure 1. SPE vacuum glass assembly.

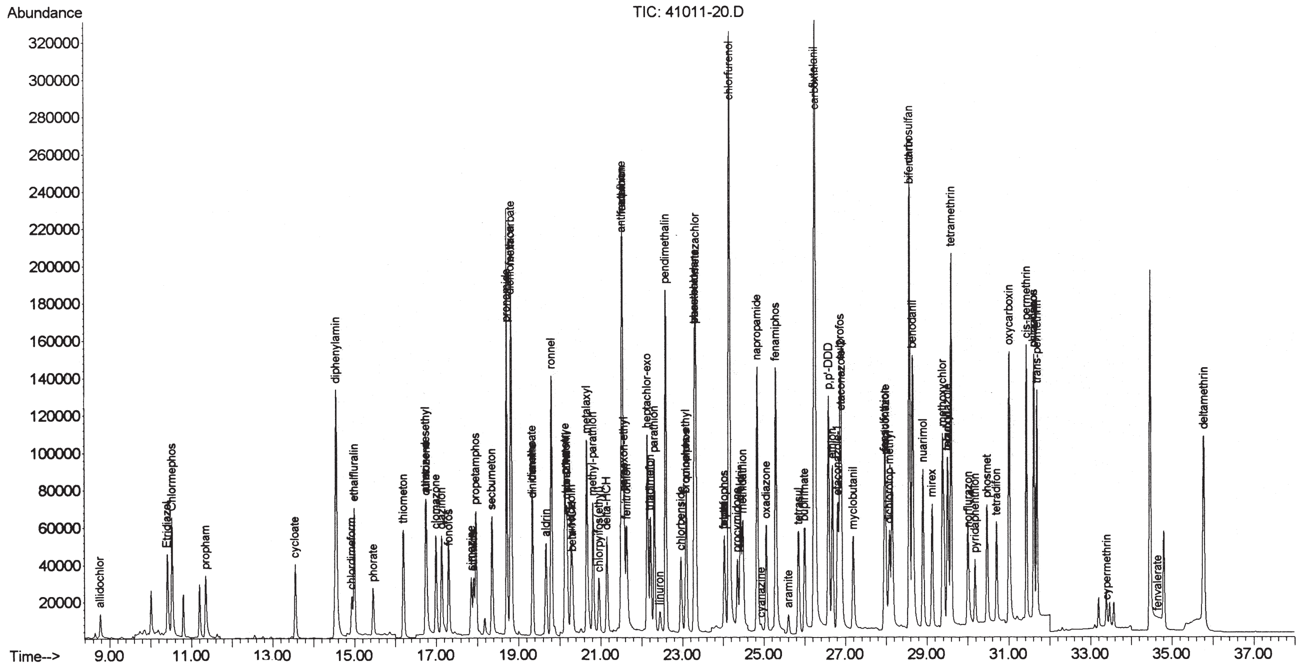

Figure 2. GC/MS chromatogram of 92 pesticides in apple samples (A group).

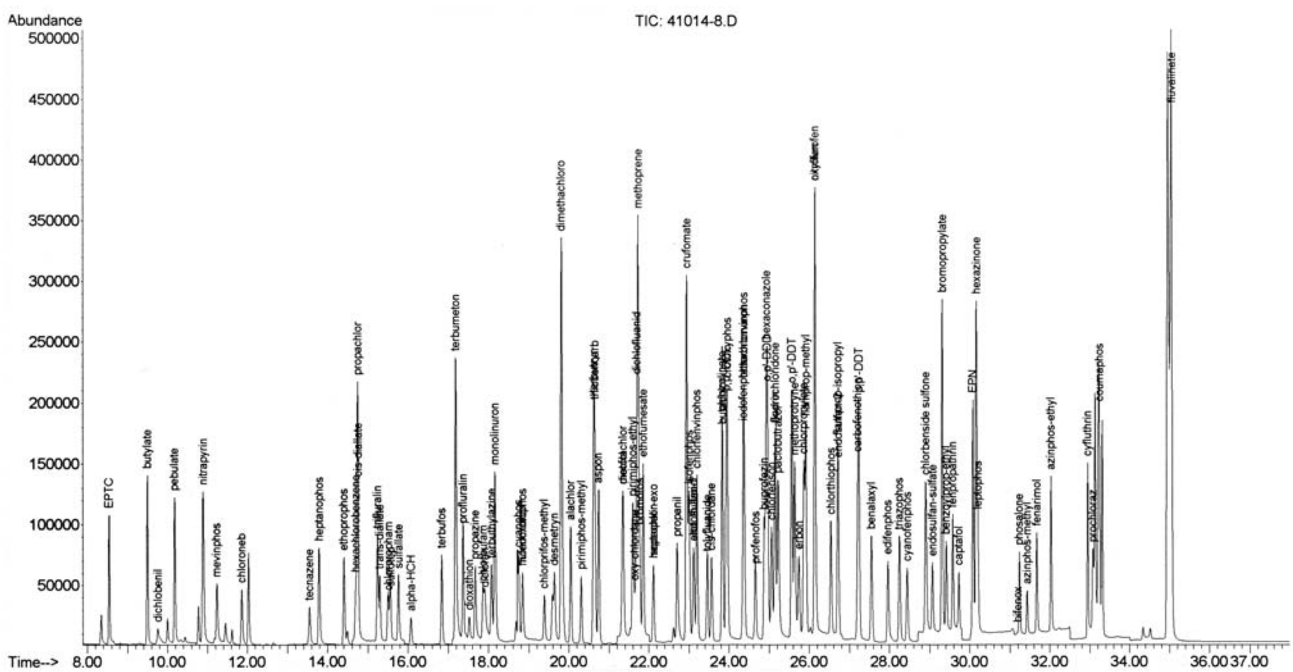

Figure 3. GC/MS chromatogram of 101 pesticides in apple samples (B group).

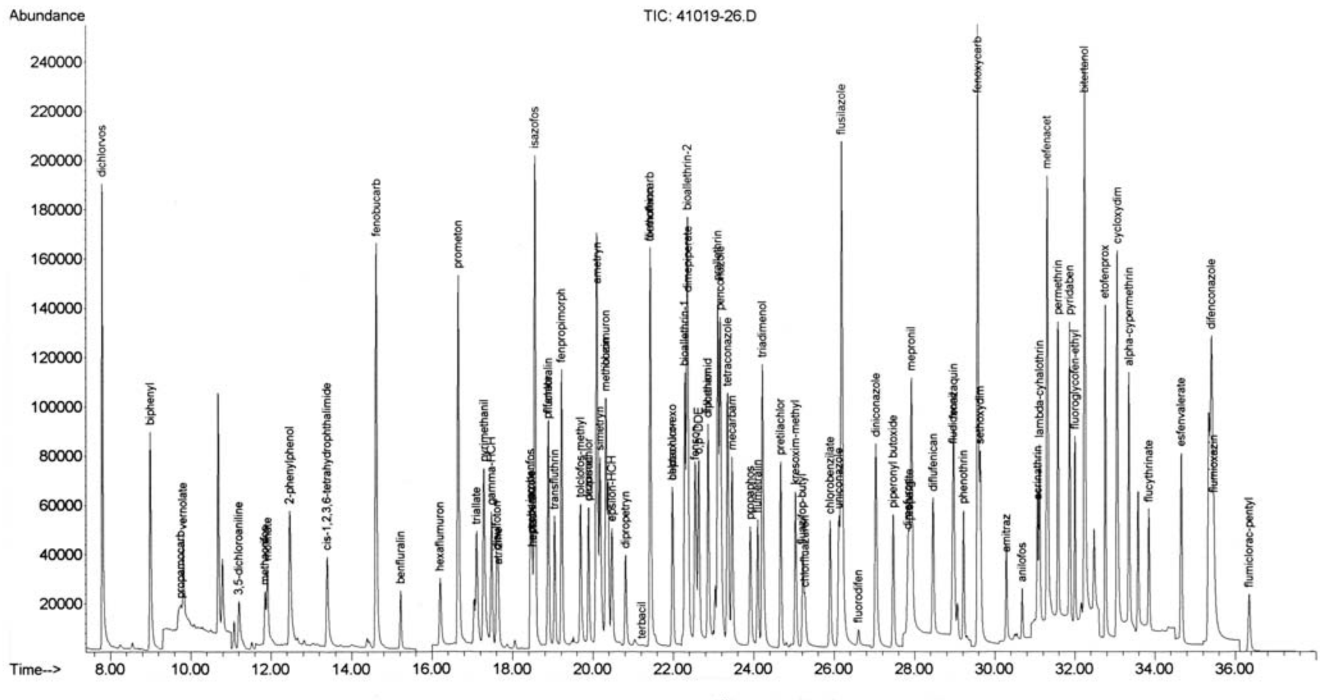

Figure 4. GC/MS chromatogram of 84 pesticides in apple samples (C group).

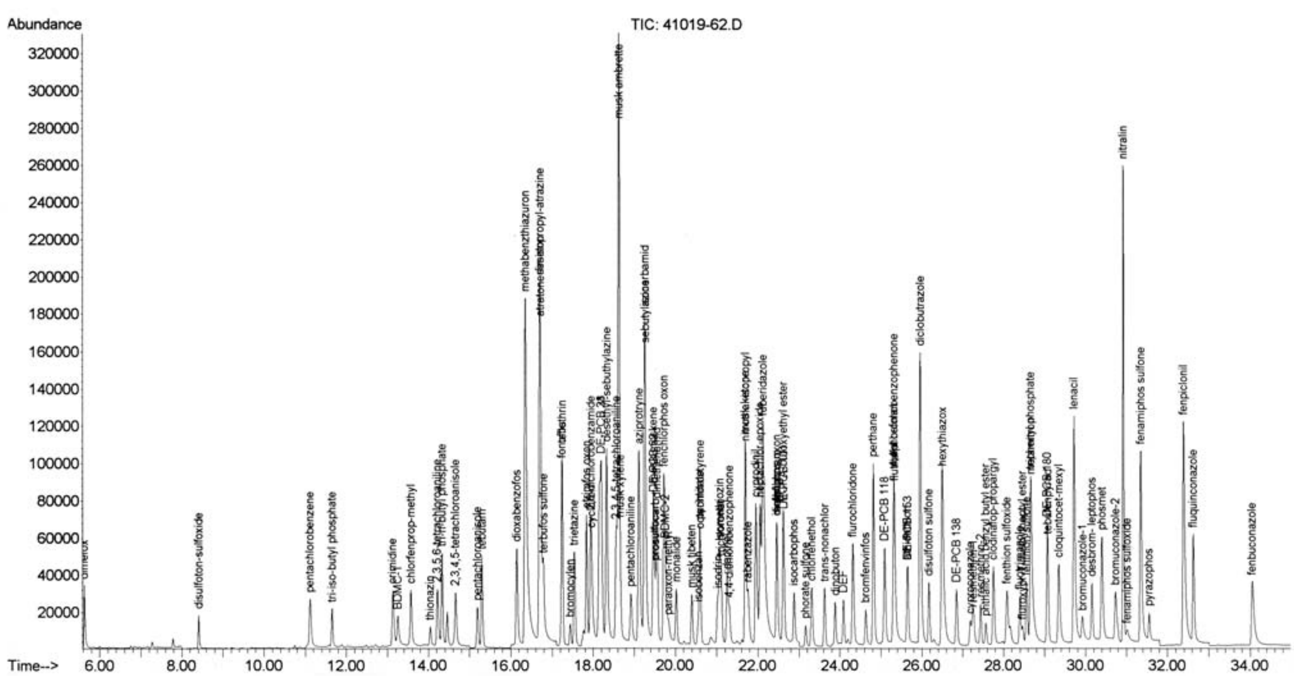

Figure 5. GC/MS chromatogram of 106 pesticides in apple samples (D group).

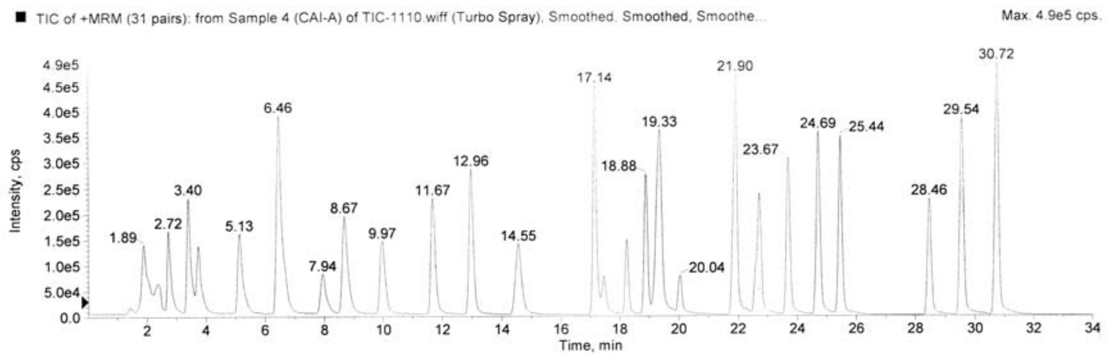

Figure 6. LC/MS/MS total ion chromatogram of standards of 30 pesticides (E group).

(**i**) *Internal standard solution.*—Accurately weigh 3.5 mg heptachlor epoxide into a 100 mL volumetric flask. Dissolve and dilute to volume with toluene.

(**j**) *Working standard mixture solution in matrix*.—Working standard mixtures A–D are prepared by diluting 40 µL internal standard solution and adequate volume standard mixture solution to 1.0 mL with blank extract that has been taken through the method with the rest of the samples. Mix thoroughly. Working standard mixture E is prepared by diluting different volumes of standard mixture solutions with sample blank extracts. They are used for plotting the standard curve. Working standard mixture solutions in matrix must be prepared freshly.

Apparatus

(**a**) *GC/MS system*.—Model 6890 N gas chromatograph connected to a 5973 N MSD and equipped with a 7683 autosampler, (Agilent Technologies, Wilmington DE), and capillary column DB-1701, 30 m × 0.25 mm × 0.25 µm (J&W Scientific, Folsom, CA). GC/MS operating conditions: column temperature program, 40°C hold 1 min, 30°C/min to 130°C, 5°C/min to 250°C, at 10°C/min to 300°C, hold 5 min carrier; gas, helium; purity, ≥99.999%; flow rate, 1.2 mL/min; injection port temperature, 290°C; injection volume, 1 µL; injection mode, splitless, purge on after 1.5 min; ionization voltage, 70 eV; ion source temperature, 230°C; GC/MS interface temperature, 280°C; selected ion monitoring (SIM) mode. For each compound, select 1 quantifying ion and 2–3 qualifying ions. The ions selected for monitoring in each SIM segment are listed for each standard mixture in Table 1. The retention time and quantitation and qualification ions for each analyte are listed in Table 2.

(**b**) *LC/MS/MS system*.—Series 1100 HPLC system (Agilent Technologies) connected to an API 3000 tandem quadrupole mass spectrometer equipped with an ion sprayer interface and electrospray interface (Applied Biosystems, Foster City, CA). The column used was an Atlantis TM dC18, 3 mm, 2.1 × 150 m (Waters). LC/MS/MS operating conditions: column temperature, 40°C; injection volume, 20 µL; scan mode, positive ion; monitor mode, multiple reaction monitor; ion spray voltage, 5500 V; nebulizer gas, 0.076 MPa; curtain gas, 0.083 MPa; turbo ionspray gas rate, 6 L/min; ion source temperature, 350°C; monitoring ions pairs, collision energy and declustering potential as in Table 2, mobile phase progam and flow rate as in Table 3.

(**c**) *Homogenizer*.—T-25B (Janke & Kunkel, Staufen, Germany).

(**d**) *Rotary evaporator.*—Buchi EL131 (Flawil, Switzerland).

(**e**) *Centrifuge.*—Z 320 (B. Hermle AG, Gosheim, Germany).

(**f**) *Pear-shaped flask*.—200 mL.

(**g**) *Pipet.*—1 mL.

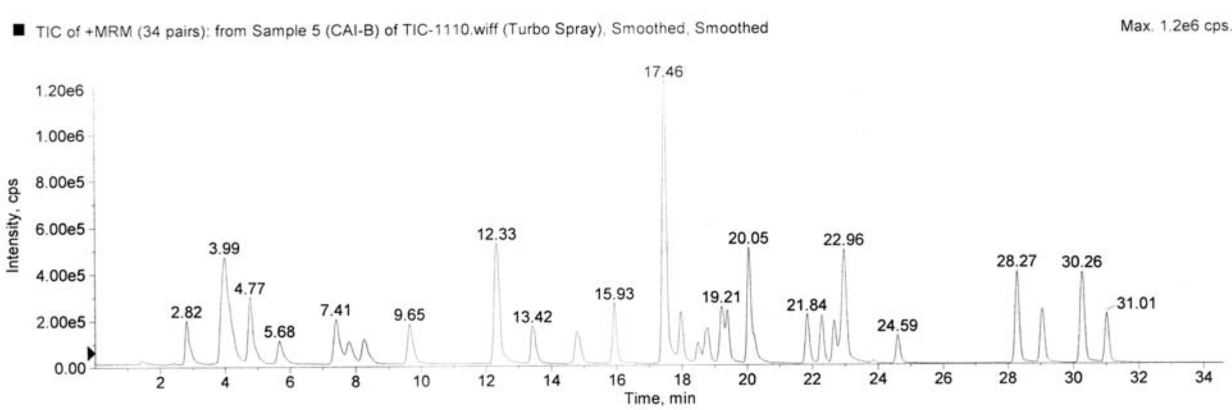

Figure 7. LC/MS/MS total ion chromatogram of standards of 33 pesticides (E group).

Table 4. Recovery and precision data for residues of 446 pesticides in fruits and vegetables

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
1	Allidochlor	0.0250	62.6	85.5	31.1	90.6	74.9	64.8	75.7	16.3	0.0500	96.4	79.7	66.7	86.6	83.0	74.9	81.2	12.5	0.2500	80.2	103.0	100.3	80.1	68.2	76.1	84.7	16.4
2	Dichlormid	0.0125	61.3	95.2	33.7	78.7	71.3	83.0	77.9	16.3	0.0250	87.3	69.1	56.2	78.2	91.7	66.3	74.8	18.0	0.1250	74.0	92.0	89.9	82.4	72.1	80.7	81.8	9.8
3	Etridiazol	0.0375	66.0	92.5	41.4	84.7	67.0	58.4	73.7	19.3	0.0750	50.9	50.8	62.3	69.3	80.0	57.3	61.8	18.4	0.3750	59.9	99.7	78.6	57.9	47.0	60.7	67.3	28.0
4	Chlormephos	0.0250	72.1	96.7	40.3	81.4	89.6	102.5	88.5	13.7	0.0500	80.4	113.2	88.4	91.3	87.9	120.6	97.0	16.5	0.2500	68.4	101.3	95.0	80.5	82.1	79.5	84.5	14.0
5	Propham	0.0125	83.9	101.0	70.0	99.1	69.9	92.1	86.0	16.1	0.0250	103.3	69.3	81.9	108.6	90.0	86.1	89.9	16.0	0.1250	58.0	98.7	96.5	89.5	108.3	97.5	91.4	19.1
6	Cycloate	0.0125	95.3	113.0	98.4	101.6	59.0	80.8	91.3	20.7	0.0250	86.5	69.4	76.9	90.7	86.4	78.3	81.4	9.7	0.1250	86.5	111.0	103.0	94.0	83.9	91.7	95.0	10.8
7	Diphenylamin	0.0125	94.3	586.3	132.6	42.5	96.3	123.0	111.6	17.2	0.0250	93.0	110.0	175.6	84.6	96.2	94.3	95.6	9.6	0.1250	84.9	105.8	106.6	101.0	90.6	107.6	99.4	9.6
8	Chlordimeform	0.0250	117.5	62.7	60.7	90.8	129.2	129.9	98.5	32.3	0.0500	87.5	76.9	102.8	88.3	76.1	89.6	86.9	11.3	0.2500	93.8	79.4	91.9	84.4	75.7	91.9	86.2	8.7
9	Ethalfluralin	0.0500	89.0	108.9	99.0	111.8	94.1	84.1	97.8	11.2	0.1000	80.4	67.8	87.6	61.3	100.0	73.4	78.4	17.9	0.5000	89.2	119.5	102.7	80.4	76.8	85.6	92.4	17.3
10	Phorate	0.0125	79.2	118.4	91.5	108.8	86.6	79.3	94.0	17.2	0.0250	59.2	71.0	90.7	74.2	83.8	100.0	79.8	18.4	0.1250	91.8	116.7	102.7	91.6	81.7	90.2	95.8	12.8
11	Thiometon	0.0125	81.1	91.2	89.5	103.4	88.9	84.3	89.7	8.5	0.0250	49.6	63.0	81.8	65.3	36.8	82.7	63.2	28.4	0.1250	86.5	82.0	100.3	90.2	78.8	88.0	87.6	8.5
12	Quintozene	0.0250	94.7	129.3	95.8	116.9	90.8	91.3	103.1	15.6	0.0500	75.7	79.7	85.5	66.3	99.4	79.9	81.1	13.6	0.2500	95.4	117.1	104.1	91.7	80.9	89.5	96.5	13.1
13	Atrazine-desethyl	0.0125	105.5	108.2	108.5	114.4	85.4	65.4	97.9	19.2	0.0250	85.6	82.5	86.1	72.4	80.9	70.7	79.7	8.3	0.1250	104.1	113.9	115.2	101.3	82.8	77.1	99.0	16.0
14	Clomazone	0.0125	103.1	115.1	110.2	117.3	95.5	87.6	104.8	11.1	0.0250	87.2	81.0	85.2	84.4	89.8	80.1	84.6	4.3	0.1250	105.5	121.6	111.6	99.8	86.0	94.8	103.2	12.2
15	Diazinon	0.0125	102.3	118.4	110.7	116.7	90.4	89.3	104.6	12.2	0.0250	88.6	81.1	89.7	82.7	95.3	75.7	85.5	8.2	0.1250	107.0	132.6	114.3	96.6	80.4	93.2	104.0	17.5
16	Fonofos	0.0125	94.6	102.9	94.5	118.7	94.3	90.8	99.3	10.4	0.0250	88.5	75.8	85.7	82.7	92.5	83.8	84.9	6.7	0.1250	100.1	115.3	107.9	99.6	87.4	95.7	101.0	9.6
17	Etrimfos	0.0125	96.6	94.4	105.3	119.6	94.1	88.1	99.7	11.3	0.0250	95.2	84.2	93.6	78.7	98.3	99.9	91.6	9.2	0.1250	104.2	139.4	115.0	106.3	88.1	99.3	108.7	16.0
18	Simazine	0.0125	110.1	106.3	116.5	113.3	76.9	65.2	98.1	21.9	0.0250	116.3	102.9	99.7	121.1	79.8	83.6	100.6	16.6	0.1250	109.8	121.1	116.5	100.7	85.1	93.6	104.5	13.3
19	Propetamphos	0.0125	99.1	112.5	115.2	126.4	98.1	87.2	106.4	13.3	0.0250	91.3	61.3	89.9	77.2	96.6	74.4	81.8	16.1	0.1250	107.4	104.9	115.5	102.4	91.7	99.7	103.6	7.7
20	Secbumeton	0.0125	100.2	102.9	105.1	117.1	86.7	78.6	98.4	14.0	0.0250	82.8	91.7	100.0	81.7	101.9	86.2	90.7	9.6	0.1250	105.8	117.6	113.5	97.1	79.9	93.6	101.2	13.8
21	Dichlofenthion	0.0125	100.2	104.7	111.7	122.9	101.2	101.2	107.0	8.3	0.0250	88.5	80.4	88.5	88.2	93.8	83.5	87.1	5.3	0.1250	101.2	115.6	113.1	111.8	95.6	105.7	107.2	7.2
22	Pronamide	0.0125	118.9	125.7	117.9	137.4	110.4	105.3	119.3	10.1	0.0250	90.8	82.5	91.0	81.6	95.1	80.6	86.9	7.0	0.1250	109.3	124.2	114.8	101.9	88.8	98.7	106.3	11.8
23	Mexacarbate	0.0375	82.9	74.4	82.0	88.5	59.7	64.2	75.3	15.1	0.0750	69.5	68.7	81.5	53.3	90.3	82.5	74.3	17.7	0.3750	97.8	109.3	96.0	76.9	56.2	72.2	84.8	23.2
24	Aldrin	0.0250	94.0	98.7	100.6	111.5	93.1	95.0	98.8	6.9	0.0500	83.0	75.9	78.8	88.4	83.9	74.9	80.8	6.4	0.2500	93.3	107.8	106.4	100.7	87.4	96.5	98.7	8.0
25	Dinitramine	0.0500	96.0	108.1	112.5	135.0	103.2	80.8	105.9	17.0	0.1000	67.6	62.1	89.4	62.2	109.7	81.2	78.7	23.8	0.5000	91.9	114.0	97.1	73.7	78.1	86.7	90.3	16.0
26	Ronnel	0.0250	97.3	103.3	105.4	124.0	99.0	91.9	103.5	10.7	0.0500	87.8	81.6	89.0	83.8	93.5	94.6	88.4	5.8	0.2500	102.4	114.5	111.3	116.3	99.9	111.6	109.3	6.1
27	Prometrye	0.0125	99.2	99.6	103.9	119.2	90.7	83.3	99.3	12.3	0.0250	88.8	88.2	88.2	88.4	94.3	85.8	88.9	3.2	0.1250	109.0	120.8	112.9	99.5	81.9	98.0	103.7	13.2
28	Cyprazine	0.0125	101.2	106.2	105.5	121.5	99.0	73.2	101.1	15.6	0.0250	83.5	83.8	89.7	81.9	92.1	99.4	88.4	7.5	0.1250	108.5	116.7	112.8	99.4	83.2	98.6	103.2	11.7
29	Vinclozolin	0.0125	88.1	95.9	102.6	114.4	98.4	79.6	96.5	12.4	0.0250	87.9	86.8	90.4	89.5	91.7	87.6	89.0	2.1	0.1250	105.2	116.8	111.0	115.6	97.5	108.5	109.1	6.6
30	beta-HCH	0.0125	87.7	91.5	94.7	108.4	100.4	76.8	93.3	11.6	0.0250	87.3	85.3	83.5	93.1	87.0	79.1	85.9	5.4	0.1250	108.6	114.9	116.1	117.3	100.1	103.7	110.1	6.5
31	Metalaxyl	0.0375	102.4	101.7	112.4	116.8	94.1	78.7	101.0	13.5	0.0750	85.9	88.5	122.1	76.3	93.7	73.8	90.0	19.3	0.3750	108.7	114.6	117.0	103.9	86.2	95.1	104.2	11.3
32	Chlorpyifosethyl	0.0125	99.9	105.9	114.4	124.7	28.6	27.5	111.2	9.7	0.0250	95.7	86.2	97.3	87.6	105.6	134.1	101.1	17.4	0.1250	106.1	125.8	115.6	94.3	81.8	91.7	102.6	15.9
33	Methyl-parathion	0.0500	94.2	110.6	100.7	131.8	110.5	72.3	103.4	19.2	0.1000	99.5	105.9	126.2	75.3	105.7	64.3	96.2	23.5	0.5000	112.9	133.5	109.4	100.2	96.3	105.7	109.6	12.0
34	Anthraquinone	0.0125	76.6	46.2	83.5	93.5	109.3	85.3	89.6	14.0	0.0250	98.6	89.9	58.4	79.5	79.2	99.0	84.1	18.2	0.1250	102.7	104.5	99.4	82.2	64.9	100.4	92.4	16.9
35	delta-HCH	0.0250	104.7	108.0	110.0	113.0	76.5	66.2	96.4	20.6	0.0500	87.8	84.6	85.9	82.1	98.5	149.4	87.8	7.2	0.2500	109.1	112.7	113.1	113.4	96.6	108.1	108.8	5.9
36	Fenthion	0.0125	99.4	111.6	114.3	124.5	103.2	86.7	106.6	12.3	0.0250	77.7	79.5	90.2	72.4	69.9	85.3	79.2	9.7	0.1250	102.7	108.3	111.0	112.5	96.3	114.7	107.6	6.4
37	Malathion	0.0500	96.7	116.8	111.0	131.9	100.6	82.4	106.6	16.2	0.1000	87.3	86.2	111.8	73.5	103.4	70.9	88.9	18.2	0.5000	108.9	122.2	115.7	110.3	94.9	109.6	110.3	8.2
38	Fenitrothion	0.0250	97.5	100.8	100.3	142.4	107.7	76.1	104.1	20.7	0.0500	96.0	118.1	136.1	87.5	122.6	64.9	104.2	25.2	0.2500	107.8	118.3	107.7	108.3	96.9	108.2	107.9	6.3
39	Paraoxon-ethyl	0.0500	82.2	93.7	95.9	153.2	87.0	61.8	84.1	16.2	0.1000	79.0	113.9	124.7	112.7	149.3	90.6	111.7	22.3	0.5000	107.0	134.3	107.7	108.7	95.7	107.8	110.2	11.6
40	Triadimefon	0.0250	101.3	105.3	111.1	122.6	93.0	77.8	101.9	15.1	0.0500	64.2	73.9	78.6	63.5	76.8	75.0	72.0	9.1	0.2500	108.5	117.9	117.9	114.4	93.5	102.9	109.2	8.8
41	Parathion	0.0500	91.6	110.9	103.7	142.6	113.2	84.1	107.7	19.0	0.1000	117.9	114.7	63.5	92.6	78.7	93.0	93.4	22.2	0.5000	108.0	129.6	112.9	100.8	93.6	107.1	108.7	11.3
42	Pendimethalin	0.0500	96.9	112.0	108.3	141.9	108.9	88.8	109.5	16.6	0.1000	78.7	98.2	112.9	57.7	107.6	75.9	88.5	24.0	0.5000	108.2	125.8	111.3	98.3	90.8	104.4	106.5	11.2
43	Linuron	0.0500	99.8	132.3	116.7	130.8	73.8	67.9	103.6	27.0	0.1000	64.0	86.3	79.5	81.1	106.2	62.2	79.9	20.2	0.5000	56.8	153.6	122.9	83.8	64.5	103.1	86.2	31.6
44	Chlorbenside	0.0250	99.5	106.7	103.0	118.4	100.6	87.6	102.6	9.8	0.0500	82.7	87.4	94.7	81.0	89.5	80.5	86.0	6.5	0.2500	106.8	116.4	110.9	115.1	104.1	115.2	111.4	4.6
45	Bromophos-ethyl	0.0125	92.4	102.2	105.6	123.9	94.4	96.3	102.5	11.3	0.0250	91.4	91.7	94.0	88.4	100.8	79.8	91.0	7.6	0.1250	107.1	119.0	115.8	127.1	109.1	123.1	116.9	6.7
46	Quinalphos	0.0125	96.5	107.2	105.1	131.2	103.1	91.1	105.7	13.1	0.0250	106.5	95.2	107.0	88.1	118.2	90.5	100.9	11.5	0.1250	111.3	124.6	116.7	109.0	93.9	109.3	110.8	9.2
47	*trans*-Chlodane	0.0125	96.9	102.4	105.3	125.6	98.3	102.3	105.1	10.0	0.0250	86.1	86.5	85.1	90.1	90.6	75.6	85.7	6.3	0.1250	103.9	113.8	115.1	123.1	103.5	114.6	112.3	6.7
48	Phenthoate	0.0250	94.1	107.1	107.0	130.2	103.4	88.0	105.0	13.8	0.0500	79.5	93.0	104.1	74.2	111.3	69.3	88.6	19.2	0.2500	106.2	117.9	115.2	113.2	97.8	111.9	110.4	6.6

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
49	Metazachlor	0.0375	102.3	102.8	109.7	118.9	93.4	77.8	100.8	14.0	0.0750	87.1	88.5	93.8	74.7	99.9	73.3	86.2	12.2	0.3750	107.3	113.8	116.1	108.7	88.6	98.7	105.5	9.7
50	Fenothiocarb	0.2000	96.3	108.7	100.9	122.5	108.7	97.8	105.8	9.2	0.4000	99.4	112.3	86.5	96.7	106.1	94.3	99.2	9.1	2.0000	115.6	118.2	112.2	108.3	100.4	110.3	110.8	5.6
51	Prothiophos	0.0125	89.4	97.9	91.3	123.6	110.9	91.0	100.7	13.7	0.0250	81.9	84.0	40.2	72.6	70.9	66.7	75.2	9.9	0.1250	101.1	117.4	110.6	111.8	98.5	110.6	108.3	6.6
52	Chlorfurenol	0.0375	98.2	127.7	107.0	123.9	104.2	69.2	105.0	20.0	0.0750	83.8	87.8	96.2	85.1	103.7	79.4	89.3	10.1	0.3750	107.6	0.6	115.8	114.1	99.2	103.1	108.0	6.5
53	Dieldrin	0.0250	99.1	104.7	107.1	118.0	98.7	97.4	104.2	7.5	0.0500	107.3	90.8	85.2	94.7	90.2	80.3	91.4	10.1	0.2500	105.6	114.5	116.5	115.0	96.4	108.2	109.3	7.0
54	Procymidone	0.0125	98.0	100.3	101.7	121.0	117.4	98.6	106.2	9.7	0.0250	88.4	89.0	85.2	88.3	90.2	148.6	88.2	2.1	0.1250	128.1	120.7	118.1	117.9	96.2	105.2	114.4	10.1
55	Methidathion	0.0250	95.8	102.7	103.2	104.8	89.1	81.4	96.2	9.7	0.0500	83.2	102.9	85.9	56.7	102.8	58.5	81.7	25.0	0.2500	107.4	996.5	117.5	109.6	97.8	107.1	107.9	6.5
56	Cyanazine	0.0375	87.9	75.3	79.5	93.2	118.7	127.3	97.0	22.0	0.0750	84.0	84.7	93.8	116.4	90.5	85.5	92.5	13.3	0.3750	88.8	81.3	82.4	125.0	108.0	108.3	99.0	17.7
57	Napropamide	0.0375	102.9	102.9	104.0	115.4	90.3	76.9	98.7	13.5	0.0750	89.4	91.3	93.0	86.6	94.9	80.2	89.2	5.9	0.3750	107.3	117.2	116.4	109.5	90.7	102.2	107.2	9.2
58	Oxadiazone	0.0125	101.9	99.4	105.4	101.0	81.1	78.8	94.6	12.2	0.0250	82.8	90.4	103.6	96.7	96.0	78.6	91.3	10.3	0.1250	107.6	112.7	116.3	120.0	100.9	114.1	111.9	6.0
59	Fenamiphos	0.0375	69.1	55.8	71.5	126.8	99.9	72.7	73.8	21.8	0.0750	69.2	101.2	120.4	51.0	69.7	59.0	78.4	34.1	0.3750	93.6	100.1	109.4	98.1	87.2	99.9	98.1	7.5
60	Tetrasul	0.0125	83.1	95.8	96.4	120.2	97.4	105.6	99.8	12.4	0.0250	86.3	86.9	91.7	91.3	90.2	84.0	88.4	3.5	0.1250	102.8	118.9	114.8	125.0	106.2	118.6	114.4	7.3
61	Aramite	0.0125	89.4	159.8	101.9	125.8	112.7	102.0	115.3	21.7	0.0250	84.6	96.3	107.1	82.2	108.5	73.9	92.1	15.3	0.1250	105.6	137.6	124.9	128.6	98.2	107.1	117.0	13.3
62	Bupirimate	0.0125	90.2	102.9	86.6	116.3	88.6	84.2	94.8	13.1	0.0250	89.5	91.3	102.0	91.2	99.2	94.6	94.6	5.2	0.1250	101.6	128.7	111.9	115.0	93.1	107.9	109.7	11.1
63	Carboxin	0.0375	66.9	55.8	76.5	104.7	79.5	64.7	74.7	22.8	0.0750	70.5	47.4	82.6	56.2	77.1	77.5	68.5	20.2	0.3750	60.4	28.2	92.7	101.4	85.6	97.5	87.5	18.6
64	Flutolanil	0.0125	93.1	113.5	106.0	122.1	95.2	72.9	100.5	17.3	0.0250	94.0	97.7	131.7	91.9	103.5	86.3	100.8	16.0	0.1250	104.0	122.7	115.3	114.9	95.5	94.6	107.8	10.7
65	*p,p'*-DDD	0.0125	73.1	85.2	95.6	81.5	107.3	74.6	86.2	15.2	0.0250	86.3	91.6	97.2	88.8	94.7	76.4	89.2	8.3	0.1250	109.9	115.1	98.7	123.6	96.6	89.5	105.6	12.1
66	Ethion	0.0250	92.2	114.4	102.9	130.6	104.4	91.8	106.0	13.9	0.0500	91.0	95.9	108.0	78.0	108.4	70.6	92.0	16.8	0.2500	106.8	128.7	115.9	121.6	105.8	120.6	116.6	7.7
67	Sulprofos	0.0250	94.4	102.8	101.6	118.6	96.8	95.1	101.5	8.9	0.0500	76.4	92.2	95.7	74.8	69.1	74.6	80.5	13.4	0.2500	102.9	104.9	113.1	113.4	95.4	108.8	106.4	6.4
68	Etaconazole-1	0.0375	95.6	106.8	73.6	117.1	85.1	77.4	92.6	18.4	0.0750	65.4	98.6	110.8	60.4	111.7	53.2	83.4	32.0	0.3750	106.5	123.8	158.3	107.5	92.9	113.9	117.2	19.3
69	Etaconazole-2	0.0375	94.3	109.1	81.8	130.4	77.5	85.1	96.4	20.9	0.0750	101.7	89.2	84.5	88.7	89.1	26.7	90.6	7.2	0.3750	116.8	131.5	128.5	99.7	77.3	108.2	110.3	18.3
70	Myclobutanil	0.0125	113.1	104.5	92.4	104.0	80.9	70.7	94.3	17.1	0.0250	90.6	91.4	99.1	68.4	101.6	62.9	85.7	18.9	0.1250	103.0	115.4	108.2	109.7	89.4	93.4	103.2	9.7
71	Dichlorofop-methyl	0.0125	166.6	160.3	104.8	127.3	110.4	94.0	109.1	12.7	0.0250	76.1	99.3	111.4	90.4	131.9	133.0	107.0	21.3	0.1250	106.9	110.1	117.2	118.5	102.7	112.8	111.4	5.5
72	Propiconazole	0.0375	91.9	97.1	100.1	115.7	91.0	83.7	96.6	11.3	0.0750	79.6	94.1	87.1	57.6	62.7	102.7	80.6	21.9	0.3750	104.1	127.0	115.8	108.8	89.7	114.2	109.9	11.4
73	Fensulfothion	0.0250	97.4	89.4	105.3	107.7	87.9	75.3	93.9	12.9	0.0500	87.4	138.6	92.2	120.4	58.3	118.2	111.4	19.1	0.2500	106.8	86.1	120.3	164.6	132.3	120.0	121.7	21.6
74	Bifenthrin	0.0125	92.2	95.6	101.3	124.7	102.7	99.8	102.7	11.1	0.0250	89.6	99.1	83.2	95.1	103.7	83.2	92.3	9.2	0.1250	102.9	116.9	118.7	112.3	96.6	109.5	109.5	7.7
75	Mirex	0.0125	97.7	99.2	105.5	130.9	97.6	100.4	105.2	12.2	0.0250	116.5	80.8	93.5	111.2	104.5	66.5	95.5	20.0	0.1250	98.7	109.8	114.8	110.8	92.4	105.6	105.3	7.9
76	Benodanil	0.0375	114.3	127.4	125.2	139.9	103.9	78.1	114.8	18.9	0.0750	77.6	106.6	109.6	68.7	111.1	68.4	90.3	23.1	0.3750	110.8	120.7	124.2	112.8	98.3	93.0	110.0	11.2
77	Nuarimol	0.0250	104.1	99.2	104.4	92.2	72.1	77.9	91.7	15.0	0.0500	93.9	92.3	96.4	82.7	95.9	74.7	89.3	9.8	0.2500	107.9	109.9	115.1	104.3	73.6	95.7	101.1	14.8
78	Methoxychlor	0.0125	83.1	106.9	108.6	126.0	94.0	85.9	100.8	16.1	0.0250	71.0	92.3	74.9	100.7	124.8	86.0	91.6	21.4	0.1250	93.9	124.3	106.6	86.6	63.2	85.4	93.3	22.2
79	Oxadxyl	0.0125	86.8	102.3	80.0	112.8	97.5	72.1	91.9	16.4	0.0250	106.0	76.5	76.4	112.4	107.4	87.3	94.3	17.2	0.1250	103.4	118.3	120.5	98.5	84.9	101.4	104.5	12.7
80	Tetramethrin	0.0250	93.2	96.9	101.7	124.9	95.6	95.2	101.2	11.8	0.0500	86.3	102.0	148.8	91.4	116.0	80.2	104.1	24.3	0.2500	103.5	114.0	114.0	114.7	95.9	112.6	109.1	7.1
81	Tebuconazole	0.0375	106.8	85.9	71.6	117.2	87.6	76.6	91.0	19.4	0.0750	88.3	100.3	93.7	62.5	119.7	74.2	89.8	22.3	0.3750	98.9	95.5	98.8	107.0	86.7	97.2	97.3	6.7
82	Norflurazon	0.0125	98.2	110.0	95.3	106.6	87.2	66.9	94.0	16.6	0.0250	88.9	94.1	98.1	86.6	98.9	85.0	91.9	6.5	0.1250	103.2	110.3	114.0	108.1	92.0	75.6	100.5	14.3
83	Pyridaphenthion	0.0125	125.0	102.3	104.6	116.8	98.2	82.0	104.8	14.3	0.0250	92.2	98.4	121.4	73.2	124.7	73.6	97.3	23.0	0.1250	101.3	124.7	115.0	121.3	100.3	108.4	111.8	9.1
84	Phosmet	0.0250	87.4	119.4	104.8	131.7	95.7	61.0	100.0	24.9	0.0500	86.0	86.9	107.7	99.5	114.5	87.4	97.0	12.6	0.2500	109.8	143.5	124.4	106.6	94.8	109.4	114.7	14.8
85	Tetradifon	0.0125	99.8	101.6	87.2	127.1	101.7	87.3	100.8	14.5	0.0250	92.9	89.7	92.3	89.0	92.4	80.3	89.4	5.3	0.1250	105.9	109.2	114.3	124.7	101.3	111.7	111.2	7.2
86	Oxycarboxin	0.0750	78.4	116.4	86.4	96.3	76.0	54.3	84.6	24.7	0.1500	84.3	49.8	64.4	100.4	78.0	56.9	72.3	26.0	0.7500	78.2	97.8	92.0	78.2	63.5	55.4	77.5	20.9
87	*cis*-Permethrin	0.0125	97.5	82.5	102.8	123.8	99.5	101.1	101.2	13.1	0.0250	99.6	104.7	118.5	112.1	114.7	116.8	111.0	6.7	0.1250	103.3	113.5	119.1	119.4	101.7	115.7	112.1	6.9
88	*trans*-Permethrin	0.0125	96.2	98.8	123.1	122.1	98.7	97.1	106.0	12.2	0.0250	94.1	99.9	108.7	99.0	106.6	76.4	97.4	11.9	0.1250	103.2	113.5	118.8	119.9	102.7	116.3	112.4	6.8
89	Pyrazophos	0.0250	84.4	95.5	109.5	130.7	101.3	85.4	101.1	17.1	0.0500	95.7	98.8	112.8	74.0	120.4	67.5	94.9	22.0	0.2500	105.3	114.9	120.0	115.7	93.5	115.4	110.8	8.8
90	Cypermethrin	0.0375	81.4	102.0	97.7	120.9	78.7	69.3	91.7	20.5	0.0750	87.5	110.8	106.6	89.9	132.7	68.1	99.3	22.5	0.3750	102.8	112.6	116.7	106.2	91.7	99.2	104.9	8.6
91	Fenvalerate	0.0500	67.1	73.2	84.4	104.8	91.7	91.2	85.4	16.0	0.1000	101.9	90.4	104.0	94.2	108.4	80.3	96.5	10.7	0.5000	101.0	103.2	112.9	119.9	101.7	109.0	108.0	6.9
92	Deltamethrin	0.0750	111.0	130.7	114.2	131.4	103.2	88.6	113.2	14.5	0.1500	82.4	94.0	93.7	143.9	112.1	64.3	89.3	19.7	0.7500	104.0	108.2	114.9	121.8	106.8	114.7	111.7	5.9
93	EPTC	0.0375	69.8	104.0	62.2	84.3	63.3	39.5	76.7	23.0	0.0750	77.3	69.1	74.1	79.7	68.5	81.9	75.1	7.4	0.3750	90.2	96.4	65.3	77.3	79.8	78.7	81.3	13.3
94	Butylate	0.0375	77.7	101.2	68.0	75.8	82.0	49.7	75.8	22.3	0.0750	76.8	68.2	76.8	83.6	66.8	77.0	74.9	8.4	0.3750	94.5	101.7	70.3	82.8	84.1	83.5	86.1	12.6
95	Dichlobenil	0.0050	74.8	74.5	49.6	75.0	81.0	49.8	67.5	20.7	0.0100	80.9	69.8	74.9	82.9	62.7	60.4	71.9	12.9	0.0500	100.5	107.7	70.3	85.8	87.8	89.3	90.2	14.3

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
96	Pebulate	0.0375	79.2	109.7	65.7	72.3	74.1	52.0	68.7	15.3	0.0750	78.0	68.3	78.8	81.1	69.6	69.3	74.2	7.7	0.3750	101.2	107.2	76.9	86.3	84.6	83.3	89.9	13.0
97	Nitrapyrin	0.0375	69.0	114.9	56.9	66.5	66.7	48.5	61.5	14.0	0.0750	71.3	105.2	67.5	74.7	72.5	81.5	78.8	17.5	0.3750	100.9	112.3	70.9	82.9	74.8	82.4	87.4	18.3
98	Mevinphos	0.0250	97.7	106.0	87.9	81.7	79.5	64.5	86.2	16.9	0.0500	70.0	108.8	96.9	101.5	75.0	83.3	89.2	17.4	0.2500	118.4	116.8	103.5	94.9	93.4	79.8	101.1	14.7
99	Chloroneb	0.0125	90.9	106.2	74.6	73.9	75.2	61.2	80.3	19.7	0.0250	82.9	71.0	75.9	87.6	81.3	86.7	80.9	7.9	0.1250	113.0	115.7	91.6	90.3	89.9	89.3	98.3	12.7
100	Tecnazene	0.0500	86.5	106.8	71.3	75.0	77.2	62.6	79.9	19.2	0.1000	81.5	69.4	91.2	68.7	74.7	69.7	75.9	11.8	0.5000	109.3	109.6	88.1	92.8	89.8	87.6	96.2	10.8
101	Heptanophos	0.0375	101.5	111.0	96.0	93.7	81.6	78.7	93.7	12.9	0.0750	86.4	71.1	81.6	78.6	79.1	78.9	79.3	6.3	0.3750	119.3	114.7	106.7	98.8	94.9	90.7	104.2	10.9
102	Hexachlorobenzene	0.0125	81.1	99.2	78.1	75.2	68.5	67.0	78.2	14.9	0.0250	73.3	64.9	71.8	77.2	68.0	69.3	70.7	6.1	0.1250	105.5	100.5	89.9	84.6	87.0	86.3	92.3	9.3
103	Ethoprophos	0.0375	93.0	96.5	87.7	93.6	85.1	79.9	89.3	7.0	0.0750	89.7	76.9	85.7	84.7	81.2	82.2	83.4	5.2	0.3750	116.1	110.5	105.9	101.6	94.7	92.8	103.6	8.7
104	*cis*-Diallate	0.0250	100.2	105.0	96.7	88.8	91.3	78.1	93.4	10.2	0.0500	83.8	75.2	83.0	85.7	77.4	109.9	85.8	14.5	0.2500	115.7	112.1	103.0	97.2	93.0	92.3	102.2	9.7
105	Propachlor	0.0375	107.8	106.9	97.3	90.8	87.8	82.5	95.5	10.8	0.0750	85.0	119.3	81.1	82.0	75.8	77.4	86.8	18.7	0.3750	121.2	115.2	112.0	98.1	92.5	88.9	104.7	12.7
106	*trans*-Diallate	0.0250	98.4	103.8	91.8	93.4	84.8	79.6	92.0	9.6	0.0500	85.6	101.7	84.0	84.1	77.8	74.9	84.7	11.0	0.2500	117.2	112.3	105.7	99.6	93.7	91.7	103.4	9.9
107	Trifluralin	0.0250	95.8	105.8	89.3	94.2	85.9	76.3	91.2	10.9	0.0500	83.4	57.5	79.9	61.3	78.5	58.8	69.9	17.0	0.2500	118.3	119.3	104.0	104.5	97.8	88.7	105.4	11.2
108	Chlorpropham	0.0250	109.3	119.8	110.1	98.6	90.6	90.0	103.1	11.6	0.0500	89.6	76.1	87.8	84.9	84.4	84.7	84.6	5.5	0.2500	123.6	119.3	114.3	101.0	94.9	90.0	107.2	12.9
109	Sulfotep	0.0125	102.3	116.7	102.0	95.0	85.8	80.6	97.1	13.3	0.0250	88.4	73.5	87.9	83.9	93.1	71.1	83.0	10.6	0.1250	120.3	116.7	110.3	101.2	94.1	91.1	105.6	11.4
110	Sulfallate	0.0250	94.0	97.3	81.6	83.9	77.2	67.8	83.6	13.0	0.0500	68.1	92.3	82.8	61.4	66.5	55.9	71.1	19.3	0.2500	112.3	80.2	95.6	91.7	89.0	84.0	92.1	12.3
111	alpha-HCH	0.0125	99.3	111.4	97.9	96.6	122.5	126.6	109.0	12.1	0.0250	86.1	76.5	87.3	85.6	76.7	122.2	89.1	19.0	0.1250	117.8	115.3	106.4	96.5	90.0	89.1	102.5	12.2
112	Terbufos	0.0250	93.6	102.6	90.0	95.3	86.3	84.1	92.0	7.3	0.0500	93.8	79.4	95.2	84.4	86.7	116.3	92.6	14.0	0.2500	117.3	113.8	109.4	100.8	94.3	88.3	104.0	11.0
113	Terbumeton	0.0375	113.5	102.0	103.9	92.9	89.3	75.7	96.2	13.7	0.0750	89.3	79.4	88.7	84.4	88.4	81.2	85.2	4.9	0.3750	123.4	115.5	114.8	100.5	91.7	83.4	104.9	14.8
114	Profluralin	0.0500	104.9	107.4	89.4	99.9	92.0	81.2	95.8	10.5	0.1000	86.6	56.3	79.9	60.2	80.1	58.5	70.3	19.0	0.5000	125.7	121.6	111.9	106.5	102.2	91.7	109.9	11.4
115	Dioxathion	0.0500	120.0	106.9	121.7	102.9	96.1	79.7	104.6	15.0	0.1000	94.6	74.0	77.5	94.4	73.5	88.0	83.7	11.8	0.5000	129.0	109.2	128.2	104.8	113.9	102.6	114.6	10.0
116	Propazine	0.0125	113.4	131.9	112.0	99.2	91.6	86.2	105.7	15.8	0.0250	89.1	77.1	82.3	83.2	78.5	73.0	80.5	6.9	0.1250	124.4	146.0	118.9	103.6	96.0	90.4	113.2	18.3
117	Chlorbufam	0.0500	112.4	104.9	98.0	95.8	85.2	76.0	95.4	13.8	0.1000	109.0	81.9	119.4	70.8	101.1	94.5	96.1	18.5	0.5000	120.8	120.7	108.4	108.9	98.3	84.1	106.9	13.1
118	Dicloran	0.0500	122.7	116.7	93.3	70.6	94.6	78.4	96.0	21.4	0.1000	100.6	84.5	118.4	87.2	87.3	65.2	90.5	19.6	0.5000	130.3	122.2	114.6	99.8	97.3	83.6	108.0	16.1
119	Terbuthylazine	0.0125	118.9	116.6	121.3	102.1	102.6	95.8	109.5	9.7	0.0250	88.4	80.6	109.7	67.6	88.2	75.1	84.9	17.0	0.1250	134.1	139.7	141.2	105.0	93.4	89.6	117.2	20.3
120	Monolinuron	0.0500	112.0	118.5	104.3	94.8	83.0	76.6	98.2	16.7	0.1000	97.9	77.2	97.8	51.3	97.9	85.5	84.6	21.8	0.5000	127.2	115.1	110.7	102.2	99.8	86.1	106.9	13.2
121	Flufenoxuron	0.0375	128.9	138.1	112.9	106.9	116.0	78.0	113.5	18.3	0.0750	77.9	70.4	80.5	63.8	73.6	47.9	69.0	17.2	0.3750	121.3	273.9	224.6	100.9	79.8	72.2	93.5	23.6
122	Cyanohos	0.0250	111.4	108.4	107.2	96.1	92.3	83.8	99.8	10.9	0.0500	88.4	73.5	88.0	76.4	86.7	77.0	81.7	8.3	0.2500	125.6	119.5	117.4	102.7	97.2	85.9	108.1	14.1
123	Chlorprifos-methyl	0.0125	106.8	103.9	101.2	102.8	92.4	89.9	99.5	6.8	0.0250	88.2	74.8	88.5	77.6	85.7	88.8	83.9	7.3	0.1250	122.4	114.2	112.3	104.0	95.1	93.5	106.9	10.7
124	Desmetryn	0.0125	111.0	102.7	102.9	88.5	78.2	74.4	92.9	16.0	0.0250	86.1	72.9	86.1	82.0	80.2	75.6	80.5	6.7	0.1250	119.2	111.5	108.7	99.8	87.4	80.5	101.2	14.7
125	Dimethachloro	0.0375	116.3	106.8	112.1	100.8	93.3	88.4	102.9	10.5	0.0750	87.7	74.2	90.1	82.0	80.1	88.1	83.7	7.2	0.3750	124.5	116.1	118.2	104.4	98.1	90.4	108.6	12.1
126	Alachlor	0.0375	112.0	105.6	109.6	100.9	92.3	89.8	101.7	8.9	0.0750	89.6	73.1	102.2	82.6	81.2	76.2	84.2	12.5	0.3750	125.3	118.4	118.2	105.0	98.4	92.9	109.7	11.7
127	Pirimiphos-methyl	0.0125	109.5	107.3	107.9	96.5	91.3	87.4	100.0	9.5	0.0250	88.0	72.8	91.1	78.5	82.4	92.1	84.2	9.1	0.1250	122.5	115.2	112.9	103.7	95.0	90.2	106.6	11.7
128	Terbutryn	0.0250	110.6	106.7	108.9	92.4	90.6	85.0	99.0	11.1	0.0500	88.0	74.4	89.1	83.2	80.9	80.3	82.6	6.6	0.2500	123.0	115.1	114.7	102.7	93.6	87.2	106.0	13.1
129	Thiobencarb	0.0250	91.8	86.4	90.1	103.7	95.0	93.2	93.4	6.3	0.0500	87.5	73.5	85.4	85.9	79.6	86.3	83.0	6.5	0.2500	126.2	116.7	118.7	104.6	98.8	94.6	109.9	11.3
130	Aspon	0.0250	114.2	111.2	109.1	98.9	98.2	90.1	103.6	9.0	0.0500	98.6	89.3	86.7	68.9	79.1	80.4	83.8	12.1	0.2500	117.8	131.6	102.5	99.7	85.1	81.0	103.0	18.7
131	Dicofol	0.0250	96.1	140.1	115.9	120.7	91.4	108.9	112.2	15.8	0.0500	88.2	105.0	134.4	135.6	124.6	165.2	125.5	21.3	0.2500	124.7	135.2	138.4	116.7	324.0	123.3	127.7	7.0
132	Metolachlor	0.0125	113.7	126.3	110.8	103.8	94.1	89.7	106.4	12.7	0.0250	89.9	73.7	90.0	80.2	84.4	83.4	83.6	7.4	0.1250	124.7	116.0	116.3	106.8	98.9	91.1	109.0	11.4
133	Oxychlordane	0.0500	126.0	117.1	91.7	101.0	82.6	81.3	100.0	18.4	0.1000	97.1	73.2	110.2	87.9	77.9	81.2	87.9	15.6	0.5000	123.8	111.1	114.0	102.0	99.6	94.3	107.4	10.1
134	Pirimiphos-ethyl	0.0250	116.0	102.7	108.4	98.8	91.3	89.5	101.1	10.1	0.0500	89.8	72.4	90.3	80.4	88.0	72.3	82.2	10.3	0.2500	129.7	115.1	116.6	107.2	95.7	92.9	109.5	12.6
135	Methoprene	0.0500	108.2	123.7	114.3	108.7	95.0	92.8	107.1	10.9	0.1000	77.8	69.7	103.7	88.0	92.0	90.7	87.0	13.6	0.5000	123.8	129.2	124.0	104.9	98.5	91.6	112.0	14.0
136	Bromofos	0.0250	110.2	111.2	104.4	97.9	84.2	85.1	98.8	12.1	0.0500	91.4	82.6	94.6	84.2	84.7	71.2	84.8	9.6	0.2500	124.5	119.0	116.4	106.8	98.7	94.0	109.9	11.0
137	Dichlofluanid	0.0750	82.0	266.4	275.4	100.7	88.6	72.4	85.9	13.8	0.1500	82.8	132.4	85.2	72.9	121.2	112.3	101.1	23.8	0.7500	110.4	136.6	126.0	98.7	88.4	80.3	106.7	20.4
138	Ethofumesate	0.0250	116.4	105.9	110.1	101.5	93.0	87.9	102.4	10.4	0.0500	84.2	105.7	103.4	107.7	98.6	125.1	104.1	12.8	0.2500	125.2	117.9	121.1	106.3	99.8	87.3	109.6	13.2
139	Isopropalin	0.0250	101.7	112.1	100.6	102.6	102.5	93.6	102.2	5.8	0.0500	87.5	68.7	110.9	59.5	84.7	87.6	83.2	21.4	0.2500	80.3	79.0	82.9	99.9	98.1	97.4	89.6	11.0
140	Endosulfan-1	0.0750	116.5	106.8	124.4	109.6	100.9	94.4	108.7	9.9	0.1500	89.6	76.3	87.6	88.7	85.6	84.0	85.3	5.7	0.7500	126.0	115.4	119.4	98.7	93.0	89.8	107.0	14.1
141	Propanil	0.0250	111.5	106.9	99.9	102.8	94.4	84.4	100.0	9.6	0.0500	99.4	91.4	112.4	82.3	93.8	120.5	100.0	14.2	0.2500	125.5	116.3	112.9	106.2	100.1	83.0	107.3	13.7
142	Isofenphos	0.0250	113.4	105.5	128.5	91.7	81.7	78.0	99.8	19.6	0.0500	93.5	71.9	95.2	80.9	92.3	71.0	84.1	13.1	0.2500	126.9	116.2	118.4	107.4	100.7	92.9	110.4	11.3
143	Crufomate	0.0750	100.0	108.5	91.5	98.0	86.1	77.2	93.6	11.8	0.1500	95.7	87.3	74.4	86.4	105.5	78.4	87.9	12.9	0.7500	121.6	110.6	107.5	107.1	99.3	82.2	104.7	12.6

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
144	Chlorfenvinphos	0.0375	110.0	108.8	108.4	106.6	95.4	92.6	103.6	7.3	0.0750	92.1	78.7	94.9	73.7	89.0	63.2	81.9	14.9	0.3750	124.6	114.5	115.1	108.1	102.1	92.8	109.5	10.1
145	*cis*-Chlordane	0.0250	116.3	107.5	111.6	106.1	96.0	95.5	105.5	7.9	0.0500	85.5	77.3	82.3	84.0	79.2	72.1	80.1	6.2	0.2500	125.2	116.9	120.0	104.5	98.1	93.9	109.7	11.6
146	Tolyfluanide	0.0375	75.6	265.5	237.0	104.7	96.7	95.8	93.2	13.3	0.0750	101.8	98.7	87.1	70.8	62.0	89.0	84.9	18.4	0.3750	23.0	141.3	129.3	102.6	91.7	79.9	108.9	23.6
147	*p,p'*-DDE	0.0125	112.5	105.9	110.6	104.2	97.2	94.9	104.2	6.8	0.0250	86.0	82.7	80.8	88.6	81.3	113.5	88.8	14.0	0.1250	125.1	114.9	119.8	104.8	99.9	95.6	110.0	10.6
148	Butachlor	0.0250	115.8	108.8	114.8	95.5	92.0	89.0	102.6	11.6	0.0500	91.0	76.9	93.6	81.1	88.1	70.4	83.5	10.7	0.2500	122.9	111.3	114.6	106.6	100.2	92.7	108.1	9.9
149	Chlozolinate	0.0250	106.4	99.4	101.0	99.4	86.9	85.9	96.5	8.5	0.0500	100.9	92.7	100.1	106.1	95.1	91.7	97.8	5.7	0.2500	120.5	113.7	115.7	98.9	94.6	86.9	105.1	12.8
150	Crotoxyphos	0.0750	96.2	110.3	104.2	102.3	93.2	84.2	98.4	9.4	0.1500	105.7	85.3	102.0	87.8	86.4	76.9	90.7	12.1	0.7500	117.7	106.1	100.8	109.6	104.9	82.5	103.6	11.4
151	Iodofenphos	0.0250	106.8	110.9	106.4	104.5	95.4	89.6	102.3	7.9	0.0500	87.5	84.4	98.7	73.5	88.1	60.4	82.1	16.3	0.2500	122.3	114.0	107.8	107.6	98.2	89.0	106.5	11.0
152	Tetrachlorvinphos	0.0375	111.5	115.4	107.9	101.7	95.0	92.7	104.0	8.8	0.0750	90.6	74.9	95.7	60.5	95.2	55.5	78.7	22.6	0.3750	125.6	115.3	114.6	106.3	100.7	89.4	108.7	11.7
153	Chlorbromuron	0.3000	119.6	234.0	116.5	98.2	86.7	88.1	101.8	15.2	0.6000	86.5	105.3	79.4	97.8	90.3	84.5	90.6	10.5	3.0000	149.1	199.6	140.8	106.5	105.0	87.6	117.8	22.1
154	Profenofos	0.0750	107.8	110.6	104.0	102.2	92.5	90.3	101.2	8.1	0.1500	94.6	76.9	94.8	68.0	93.8	53.8	80.3	21.3	0.7500	122.5	112.1	112.9	105.3	99.8	94.2	107.8	9.4
155	Fluorochloridone	0.1000	91.9	104.1	76.8	99.2	88.1	71.9	88.7	14.1	0.2000	91.3	75.9	95.7	75.8	99.8	78.6	86.2	12.4	1.0000	115.2	100.3	95.0	101.4	101.4	96.2	101.6	7.1
156	Buprofezin	0.0250	106.7	99.4	105.3	90.2	87.4	87.0	96.0	9.3	0.0500	91.0	72.5	75.6	95.9	93.0	99.3	87.9	12.7	0.2500	123.0	111.1	107.1	95.2	89.2	87.9	102.2	13.5
157	*o,p'*-DDD	0.0250	128.0	551.6	120.0	112.8	117.1	112.2	118.0	5.5	0.0500	90.6	80.9	93.5	92.3	82.5	86.1	87.7	6.0	0.2500	126.2	128.5	103.5	96.2	108.8	71.0	105.7	20.1
158	Endrin	0.1500	117.3	117.0	109.0	102.5	92.2	99.6	106.3	9.4	0.3000	89.1	77.9	93.0	72.8	92.2	66.7	81.9	13.5	1.5000	125.1	112.3	115.5	105.9	101.8	96.5	109.5	9.4
159	Hexaconazole	0.1500	106.9	70.5	97.3	89.2	91.6	72.9	88.1	16.0	0.3000	103.1	76.0	107.1	89.6	101.4	78.6	92.6	14.3	1.5000	126.7	114.5	117.4	104.7	100.4	97.2	110.1	10.3
160	Chlorfenson	0.0250	112.0	99.9	102.2	113.4	107.9	98.2	105.6	6.1	0.0500	90.2	81.1	91.4	88.2	86.9	91.1	88.2	4.4	0.2500	133.9	121.8	123.1	107.6	101.2	94.9	113.7	13.1
161	*o,p'*-DDT	0.0250	109.9	117.2	109.6	107.5	91.9	92.2	104.7	9.9	0.0500	85.1	76.2	96.7	77.3	103.8	114.0	92.2	16.5	0.2500	123.2	115.1	118.2	106.5	96.4	93.5	108.8	11.1
162	Paclobutrazol	0.0375	120.7	106.6	101.4	100.0	87.6	74.0	98.4	16.3	0.0750	92.6	72.8	96.2	59.1	89.3	63.9	79.0	20.0	0.3750	119.6	106.2	105.9	107.0	101.9	74.4	102.5	14.6
163	Methoprotryne	0.0375	111.8	106.1	102.9	94.1	87.4	81.3	97.2	12.0	0.0750	92.0	77.3	92.2	80.9	86.5	69.5	83.1	10.8	0.3750	122.3	112.2	111.5	101.2	90.5	82.6	103.4	14.4
164	Erbon	0.0250	111.3	135.1	102.8	95.3	92.1	88.4	104.2	16.5	0.0500	71.2	102.5	91.7	80.0	91.8	116.7	92.3	17.4	0.2500	126.2	117.1	110.6	101.1	93.4	107.3	109.3	10.6
165	Chlorpropylate	0.0125	113.4	113.3	109.6	106.7	94.9	91.9	105.0	8.9	0.0250	95.4	84.8	107.5	81.9	96.7	81.8	91.4	11.2	0.1250	125.0	119.1	114.4	106.8	100.8	92.5	109.8	11.0
166	Flamprop-methyl	0.0125	114.1	102.4	112.5	101.0	94.1	91.1	102.5	9.1	0.0250	91.4	90.6	102.6	90.3	88.9	80.5	90.7	7.8	0.1250	125.6	107.1	117.1	106.6	100.8	86.6	107.3	12.5
167	Nitrofen	0.0750	110.2	132.2	95.4	108.6	97.5	88.6	105.4	14.7	0.1500	100.3	118.0	107.4	87.2	115.7	97.9	104.4	11.1	0.7500	131.5	124.6	116.5	112.9	106.6	94.2	114.4	11.5
168	Oxyflurofen	0.0500	107.4	121.4	96.1	111.4	100.5	89.1	104.3	11.1	0.1000	107.0	92.6	111.3	85.0	104.4	86.4	97.8	11.5	0.5000	129.2	122.3	117.2	113.6	105.1	92.2	113.2	11.6
169	Chlorthiophos	0.0375	114.4	108.2	110.7	107.4	96.3	96.7	105.6	7.1	0.0750	93.7	77.8	107.9	85.5	88.3	70.6	87.3	14.8	0.3750	126.0	115.2	117.4	105.9	97.9	91.7	109.0	11.8
170	Endosulfan-2	0.3000	112.3	126.1	67.8	103.2	83.6	73.8	94.5	24.4	0.6000	100.9	107.4	105.2	97.2	102.6	85.4	99.8	7.9	3.0000	105.6	115.2	117.2	99.3	92.6	86.5	102.7	11.9
171	Flamprop-isopropyl	0.0125	107.5	122.4	105.3	106.7	91.9	88.5	103.7	11.8	0.0250	91.6	86.6	92.8	90.5	86.3	80.0	88.0	5.3	0.1250	122.6	118.9	114.6	106.9	99.9	90.5	108.9	11.2
172	*p,p'*-DDT	0.0250	105.6	116.0	109.2	108.0	96.0	94.9	105.0	7.8	0.0500	96.6	88.3	94.4	82.3	103.0	95.8	93.4	7.7	0.2500	124.6	115.2	119.8	107.3	95.9	93.9	109.4	11.5
173	Carbofenothion	0.0250	108.3	103.6	104.3	109.3	99.0	93.4	103.0	5.8	0.0500	96.7	81.2	103.3	85.1	93.3	66.6	87.7	14.9	0.2500	124.9	113.0	115.0	108.0	99.5	92.3	108.8	10.7
174	Benalaxyl	0.0125	110.1	118.4	108.2	102.7	94.3	92.9	104.4	9.4	0.0250	92.2	82.8	106.3	89.1	87.6	90.5	91.4	8.7	0.1250	127.6	122.1	117.7	105.2	98.8	88.6	110.0	13.6
175	Edifenphos	0.0250	92.8	113.9	91.7	70.8	66.9	66.4	83.8	22.7	0.0500	101.8	78.8	105.3	88.2	100.3	95.7	95.0	10.4	0.2500	121.2	109.0	107.7	106.5	104.1	73.1	103.6	15.5
176	Triazophos	0.0375	114.1	196.9	110.2	105.9	92.4	89.4	102.4	10.7	0.0750	117.4	88.1	113.0	97.3	113.2	81.7	101.8	14.6	0.3750	127.3	127.5	115.5	107.7	94.3	82.7	109.2	16.5
177	Cyanofenphos	0.0125	110.3	99.1	104.2	109.7	99.1	94.0	102.7	6.3	0.0250	95.3	77.3	93.8	93.2	116.1	69.8	90.9	17.7	0.1250	126.5	110.3	114.5	106.9	100.2	90.4	108.2	11.4
178	Chlorbenside sulfone	0.0250	114.9	105.9	103.0	103.8	97.9	91.9	102.9	7.5	0.0500	92.9	80.6	87.9	91.9	87.7	85.5	87.8	5.1	0.2500	125.4	112.9	115.4	104.6	99.6	83.4	106.9	13.7
179	Endosulfan-sulfate	0.0375	125.0	112.0	110.6	110.1	96.8	121.7	112.7	8.8	0.0750	91.1	86.5	96.1	87.5	111.6	74.7	91.3	13.4	0.3750	124.9	116.4	119.7	105.8	98.6	86.7	108.7	13.3
180	Bromopropylate	0.0250	113.0	105.2	109.7	110.8	99.0	95.9	105.6	6.5	0.0500	100.9	90.0	110.7	95.7	117.1	87.3	100.3	11.7	0.2500	127.2	110.7	116.2	106.7	101.0	93.6	109.2	10.8
181	Benzoylprop-ethyl	0.0375	118.6	106.7	116.6	105.9	103.5	95.2	107.7	8.0	0.0750	93.1	80.1	94.5	86.6	83.2	76.7	85.7	8.3	0.3750	128.7	116.0	120.1	104.7	98.3	91.0	109.8	13.0
182	Fenpropathrin	0.0250	100.8	105.3	107.5	105.7	99.2	102.0	103.4	3.1	0.0500	102.0	82.8	108.1	89.3	91.5	72.1	91.0	14.3	0.2500	125.1	110.9	115.5	109.1	101.3	94.9	109.5	9.7
183	Leptophos	0.0250	112.9	105.4	109.2	98.4	91.4	96.8	102.4	8.0	0.0500	97.3	85.7	104.0	83.7	99.0	67.7	89.6	14.8	0.2500	125.2	108.1	112.9	107.1	98.5	93.5	107.6	10.3
184	EPN	0.0500	104.2	82.6	73.3	122.3	103.0	103.5	98.2	17.8	0.1000	88.7	113.1	87.0	78.9	111.8	73.8	92.2	18.0	0.5000	126.1	111.9	109.6	113.0	105.3	89.9	109.3	10.8
185	Hexazinone	0.0375	115.9	105.4	107.4	94.6	92.0	64.9	96.7	18.5	0.0750	82.9	84.5	97.5	66.9	78.8	53.5	77.4	19.8	0.3750	120.8	115.6	118.4	101.2	94.4	68.0	103.1	19.5
186	Phosalone	0.0250	127.3	70.4	114.3	107.4	99.8	99.4	103.1	18.5	0.0500	113.1	86.9	115.8	77.3	115.1	90.2	99.7	16.9	0.2500	122.8	104.8	109.7	109.0	96.5	85.0	104.6	12.3
187	Azinphos-methyl	0.1500	101.6	120.2	93.0	94.0	94.9	101.1	100.8	10.1	0.3000	113.7	81.1	97.5	104.3	105.5	84.7	97.8	13.0	1.5000	131.9	106.6	107.7	115.7	96.3	76.5	105.8	17.6
188	Fenarimol	0.0250	116.5	108.6	111.3	87.7	91.0	86.4	100.2	13.3	0.0500	96.9	82.8	93.9	85.2	90.0	78.8	87.9	7.8	0.2500	126.1	109.1	115.0	94.6	97.1	80.9	103.8	15.6
189	Azinphos-ethyl	0.0250	122.3	107.5	110.4	107.3	95.8	92.8	106.0	10.1	0.0500	91.6	93.6	105.6	71.2	86.1	99.1	91.2	13.0	0.2500	128.6	111.7	114.1	108.7	97.6	84.6	107.5	14.0
190	Prochloraz	0.0750	79.1	81.6	70.7	75.6	69.8	77.8	75.8	6.2	0.1500	95.8	107.1	96.7	79.7	81.8	90.0	91.9	11.2	0.7500	106.9	94.5	106.2	85.9	91.5	59.8	90.8	19.0

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
191	Coumaphos	0.0750	102.6	94.2	81.6	99.3	90.8	92.9	93.6	7.8	0.1500	98.7	98.5	130.2	110.8	113.8	96.7	108.1	12.0	0.7500	124.5	108.5	115.5	106.3	98.7	95.9	108.2	9.8
192	Cyfluthrin	0.1500	114.1	107.3	106.0	103.5	99.0	95.6	104.2	6.3	0.3000	104.9	82.0	109.1	93.8	105.6	84.5	96.7	12.0	1.5000	129.6	107.6	115.2	107.9	97.6	84.2	107.0	14.4
193	Fluvalinate	0.1500	111.4	100.4	108.2	107.4	97.9	94.9	103.4	6.3	0.3000	108.9	97.4	108.4	86.5	111.0	92.0	100.7	10.2	1.5000	127.4	108.0	118.4	108.1	100.0	94.9	109.5	10.9
194	Dichlorvos	0.0750	103.5	64.9	79.5	66.9	49.7	57.0	63.6	17.6	0.1500	69.4	91.3	67.9	83.9	64.8	81.7	76.5	13.9	0.7500	92.2	85.1	63.8	65.6	46.8	75.9	71.6	22.9
195	Biphenyl	0.0125	113.4	64.8	79.9	73.0	58.1	57.6	66.7	14.5	0.0250	75.4	68.7	64.3	87.0	63.0	74.9	72.2	12.3	0.1250	74.6	81.7	66.1	68.6	46.1	70.7	68.0	17.7
196	Vernolate	0.0125	114.4	77.6	94.2	71.6	58.5	50.2	77.8	30.3	0.0250	78.7	89.5	70.4	94.8	67.5	81.7	80.4	13.2	0.1250	99.4	60.9	83.3	75.7	56.5	80.7	76.1	20.6
197	3,5-Dichloroaniline	0.0125	72.9	49.7	84.9	57.0	50.3	53.6	61.4	23.3	0.0250	50.8	56.2	63.0	76.1	67.9	46.1	60.0	18.6	0.1250	79.8	63.0	69.6	51.8	32.4	66.3	66.1	15.4
198	Molinate	0.0125	124.3	81.2	114.0	83.0	66.0	73.4	90.3	25.9	0.0250	76.6	77.7	73.5	95.6	64.4	86.7	79.1	13.7	0.1250	107.4	98.6	96.9	81.3	60.4	83.3	88.0	19.0
199	Methacrifos	0.0125	98.2	88.8	104.6	82.3	66.1	70.7	85.1	17.8	0.0250	104.5	69.0	68.4	94.9	86.4	83.9	84.5	16.8	0.1250	118.3	109.7	109.0	78.5	54.5	86.0	92.7	26.1
200	2-Phenylphenol	0.0125	110.6	92.4	121.1	95.8	83.3	78.9	97.0	16.7	0.0250	74.1	81.9	83.9	98.2	70.0	101.8	85.0	15.0	0.1250	110.9	112.3	111.5	91.1	64.1	81.8	95.3	20.8
201	*cis*-1,2,3,6-Tetrahydrophthalimide	0.0375	93.9	90.6	108.9	90.2	80.5	64.6	88.1	16.7	0.0750	61.2	82.4	87.7	77.5	58.9	103.7	78.6	21.4	0.3750	94.7	102.4	85.3	89.5	66.4	78.3	86.1	14.7
202	Fenobucarb	0.0250	103.0	98.6	105.3	95.1	99.4	85.5	97.8	7.2	0.0500	82.8	112.9	86.2	91.8	92.3	132.7	99.8	19.3	0.2500	99.6	110.3	103.4	93.9	68.5	87.8	93.9	15.6
203	Benfluralin	0.0125	134.6	99.7	145.6	95.1	78.6	83.2	106.1	26.0	0.0250	90.2	89.5	96.4	91.6	86.6	88.0	90.4	3.8	0.1250	127.8	114.6	129.2	98.1	66.2	86.4	103.7	24.0
204	Hexaflumuron	0.0750	80.6	61.2	90.3	77.8	52.3	62.9	70.8	20.2	0.1500	69.4	57.7	66.0	81.8	60.5	72.7	68.0	12.9	0.7500	49.8	154.6	56.3	68.9	63.3	83.0	64.3	19.8
205	Prometon	0.0375	113.6	93.7	114.2	89.2	79.5	72.9	93.9	18.3	0.0750	90.2	88.5	89.0	97.9	84.9	99.6	91.7	6.3	0.3750	107.7	107.6	112.2	97.3	66.8	89.0	96.8	17.5
206	Triallate	0.0250	120.6	100.0	120.1	95.8	85.1	90.4	102.0	14.8	0.0500	79.5	80.9	76.9	94.0	71.4	86.1	81.5	9.6	0.2500	107.0	111.8	109.0	95.7	70.9	89.8	97.4	15.9
207	Pyrimethanil	0.0125	117.9	98.0	116.5	86.6	82.4	72.5	95.6	19.4	0.0250	82.9	87.9	82.9	97.9	70.7	125.6	91.3	20.8	0.1250	106.7	114.5	108.6	95.8	72.1	85.9	97.3	16.4
208	gamma-HCH	0.0250	104.6	88.4	143.9	97.2	88.7	91.3	94.0	7.3	0.0500	95.4	83.4	76.8	95.9	71.5	96.8	86.6	12.7	0.2500	108.5	119.1	108.7	94.0	71.6	87.3	98.2	17.6
209	Disulfoton	0.0125	77.5	108.6	115.9	92.6	95.3	82.8	95.4	15.4	0.0250	51.0	81.0	79.1	70.9	75.2	79.5	72.8	15.5	0.1250	84.2	46.6	105.9	94.9	68.9	88.2	81.4	25.8
210	Atrizine	0.0125	118.2	104.7	122.8	95.2	86.3	74.1	100.2	18.7	0.0250	82.7	73.8	82.1	92.3	70.4	86.8	81.3	10.0	0.1250	107.8	111.7	114.1	98.6	71.6	86.2	98.3	16.9
211	Heptachlor	0.0375	87.4	102.7	95.2	92.4	84.3	88.5	91.7	7.2	0.0750	90.7	85.8	82.4	81.6	79.0	107.9	87.9	12.0	0.3750	84.2	105.9	87.4	94.8	69.5	89.3	88.5	13.6
212	Iprobenfos	0.0375	121.4	111.1	136.9	74.2	57.3	68.8	95.0	34.1	0.0750	95.9	102.8	110.3	90.5	92.7	83.1	95.9	10.0	0.3750	27.4	112.6	27.2	101.7	102.8	96.3	103.4	6.6
213	Isazofos	0.0250	109.0	77.6	264.0	93.5	79.8	78.6	87.7	15.4	0.0500	89.5	277.6	127.9	107.3	87.3	109.7	104.3	15.9	0.2500	106.5	108.5	128.8	98.4	72.4	90.0	100.7	18.9
214	Plifenate	0.0500	129.0	85.2	128.2	97.4	85.3	92.3	102.9	19.9	0.1000	71.0	83.6	89.4	98.3	76.9	261.5	83.8	12.7	0.5000	104.3	112.3	106.9	96.8	71.5	90.3	97.0	15.1
215	Fenpropimorph	0.0125	102.0	93.1	106.5	89.0	85.2	80.4	92.7	10.8	0.0250	86.2	104.6	89.8	106.1	79.6	96.1	93.7	11.2	0.1250	94.0	97.3	98.7	94.5	64.7	86.7	89.3	14.3
216	Transfluthrin	0.0125	116.3	101.6	125.4	98.0	91.1	93.2	104.3	13.1	0.0250	84.7	86.7	82.3	100.6	85.3	321.1	87.9	8.3	0.1250	104.4	112.1	108.2	99.2	76.0	92.0	98.6	13.3
217	Fluchloralin	0.0500	133.3	101.2	150.2	97.7	92.4	89.5	110.7	22.6	0.1000	82.9	80.1	95.2	86.0	84.6	86.8	85.9	5.9	0.5000	118.7	113.8	122.6	99.1	71.9	88.1	102.4	19.3
218	Tolclofos-methyl	0.0125	114.5	101.9	123.1	98.5	92.2	93.1	103.9	11.9	0.0250	81.2	82.6	83.6	94.6	74.0	86.2	83.7	8.1	0.1250	107.6	113.1	112.5	97.8	76.2	91.4	99.8	14.4
219	Propisochlor	0.0125	127.7	105.6	111.3	94.9	90.8	86.8	102.8	14.8	0.0250	99.1	80.2	73.9	93.9	71.0	66.8	80.8	16.1	0.1250	110.3	121.6	94.3	107.3	80.2	100.0	102.3	14.0
220	Ametryn	0.0375	116.7	100.7	120.4	88.3	89.8	74.3	98.4	18.1	0.0750	81.2	82.6	86.2	94.2	73.3	87.8	84.2	8.4	0.3750	108.9	112.1	112.8	96.6	72.2	87.3	98.3	16.5
221	Simetryn	0.0250	102.8	120.3	119.1	88.3	91.5	79.1	100.2	16.9	0.0500	81.5	85.3	90.9	102.2	72.4	90.5	87.1	11.5	0.2500	109.3	109.9	115.6	94.9	73.5	89.0	98.7	16.1
222	Methobromuron	0.0750	112.1	98.2	114.3	91.2	79.8	65.5	93.5	20.2	0.1500	101.1	107.6	117.9	63.1	86.8	70.9	91.2	23.5	0.7500	100.9	106.7	105.1	96.6	68.1	85.0	93.7	15.8
223	Metribuzin	0.0375	107.2	93.0	116.2	91.5	87.5	71.3	94.4	16.6	0.0750	83.5	79.9	95.6	86.4	72.1	71.6	81.5	11.2	0.3750	97.6	109.2	103.3	96.1	67.7	83.4	92.9	16.2
224	Dimethipin	0.0375	103.6	92.1	68.0	86.7	84.9	71.0	84.4	15.7	0.0750	68.7	79.2	70.8	91.0	65.0	102.2	79.5	18.3	0.3750	95.4	93.4	76.8	95.9	71.5	96.8	86.6	12.7
225	epsilon-HCH	0.0250	112.7	92.3	79.7	84.9	100.2	73.4	90.5	15.9	0.0500	82.0	75.5	84.8	77.8	83.6	107.7	85.2	13.6	0.2500	101.0	91.0	79.1	70.9	75.2	79.5	81.1	12.8
226	Dipropetryn	0.0125	120.0	106.8	126.4	92.7	101.3	78.8	104.3	16.8	0.0250	83.7	86.2	88.0	98.7	75.5	89.3	86.9	8.7	0.1250	106.9	112.1	113.3	99.8	72.9	88.3	98.9	15.9
227	Formothion	0.1000	106.2	93.5	121.4	78.3	81.9	63.7	90.8	22.8	0.2000	98.5	117.7	85.7	74.4	77.2	65.9	86.6	21.8	1.0000	100.2	135.9	108.9	106.2	85.3	93.0	104.9	16.7
228	Diethofencarb	0.0750	115.9	103.9	129.8	100.4	85.0	80.6	102.6	18.1	0.1500	90.9	98.0	109.2	102.8	85.2	142.3	104.7	19.4	0.7500	99.4	117.2	98.2	99.6	77.5	87.6	96.6	13.8
229	Dimepiperate	0.5000	116.9	97.6	130.0	103.3	112.3	123.0	113.9	10.6	1.0000	115.9	104.8	127.7	89.7	90.4	111.9	106.7	14.0	5.0000	101.1	111.4	103.5	110.2	83.4	110.3	103.3	10.3
230	Bioallethrin-1	0.0500	103.1	91.8	163.6	95.7	83.7	79.1	90.7	10.5	0.1000	88.7	93.6	110.2	95.9	112.8	79.3	96.8	13.2	0.5000	108.0	115.3	109.9	100.6	62.3	76.3	95.4	22.2
231	Bioallethrin-2	0.0500	120.4	111.1	155.4	95.5	81.4	79.8	97.6	18.4	0.1000	81.8	88.3	120.2	97.9	110.0	83.7	97.0	15.9	0.5000	99.4	93.7	104.0	100.7	74.5	92.0	94.1	11.2
232	*o,p'*-DDE	0.0125	104.1	101.2	110.4	98.7	95.3	97.9	101.3	5.3	0.0250	76.8	81.6	78.6	96.4	71.3	85.6	81.7	10.6	0.1250	101.6	111.2	106.3	97.1	75.7	93.0	97.5	12.8
233	Fenson	0.2500	103.6	101.4	137.4	101.3	90.9	89.8	104.1	16.7	0.5000	95.0	83.7	85.3	98.7	86.7	84.9	89.1	7.0	2.5000	100.9	101.0	124.7	99.7	76.5	89.3	98.7	16.1
234	Diphenamid	0.0125	118.2	103.5	119.1	94.4	93.6	83.5	102.0	14.1	0.0250	87.5	90.3	90.0	103.2	78.6	128.9	96.4	18.4	0.1250	103.5	110.2	109.5	99.9	73.9	86.4	97.2	14.8
235	Chlorthion	0.1000	129.3	101.3	153.4	99.0	89.9	97.1	111.7	22.0	0.2000	102.1	122.9	158.1	114.0	102.2	82.2	113.6	22.7	1.0000	125.7	130.7	129.2	109.1	77.5	88.1	110.0	20.7
236	Prallethrin	0.0375	96.1	111.7	108.1	98.2	102.1	84.9	100.2	9.5	0.0750	93.6	120.5	115.0	87.5	95.8	266.8	102.5	14.0	0.3750	118.8	111.2	126.5	105.1	77.3	91.9	105.1	17.2
237	Penconazole	0.0375	105.6	99.6	108.6	93.1	86.0	78.4	95.2	12.2	0.0750	76.5	91.8	71.3	61.5	52.3	48.3	66.9	24.3	0.3750	100.1	109.6	102.9	97.4	70.8	86.6	94.6	14.7

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
238	Mecarbam	0.0500	111.6	102.4	122.0	98.8	111.3	87.0	105.5	11.5	0.1000	87.9	102.1	100.8	100.2	84.5	84.7	93.4	9.1	0.5000	101.0	112.2	105.4	100.6	77.9	91.8	98.1	12.2
239	Tetraconazole	0.0375	105.8	99.8	113.9	94.3	90.5	75.9	96.7	13.6	0.0750	89.2	92.3	96.4	92.3	79.0	76.8	87.7	9.0	0.3750	101.6	112.8	107.2	100.6	73.5	85.3	96.8	15.2
240	Propaphos	0.0250	63.9	81.4	62.7	50.1	73.0	59.2	65.0	15.3	0.0500	88.7	92.1	68.0	56.5	76.0	58.6	73.3	20.4	0.2500	71.1	78.7	74.6	65.9	47.2	64.7	67.0	16.5
241	Flumetralin	0.0250	138.9	101.8	119.7	101.5	92.3	79.7	105.7	19.8	0.0500	89.5	126.2	108.2	116.7	105.1	118.7	110.7	11.6	0.2500	117.1	88.1	124.5	104.5	76.1	87.3	99.6	19.0
242	Triadimenol	0.0375	88.8	91.1	124.9	91.7	80.3	67.1	90.6	21.2	0.0750	84.1	86.6	98.2	85.1	84.8	107.9	91.1	10.7	0.3750	95.4	116.4	112.2	100.5	70.5	81.8	96.1	18.3
243	Pretilachlor	0.0250	97.7	101.1	108.8	103.5	90.0	85.7	97.8	8.8	0.0500	83.9	87.1	99.7	92.6	79.0	76.8	86.5	9.9	0.2500	97.5	114.6	103.6	102.3	75.2	89.7	97.1	13.9
244	Kresoxim-methyl	0.0125	93.3	102.5	106.0	99.7	94.1	84.7	96.7	7.9	0.0250	73.0	75.1	98.9	85.0	64.5	86.1	80.4	15.0	0.1250	91.5	114.6	99.0	101.4	77.2	88.4	95.3	13.4
245	Fluazifop-butyl	0.0125	98.1	94.1	104.1	100.1	97.0	85.7	96.5	6.5	0.0250	88.3	95.9	100.7	109.6	86.0	98.6	96.5	8.9	0.1250	98.0	114.4	101.9	103.1	80.1	94.4	98.7	11.5
246	Chlorfluazuron	0.0750	56.2	88.9	60.4	110.2	160.0	119.7	87.1	32.8	0.1500	71.1	53.6	51.9	78.4	72.5	55.8	63.9	17.9	0.7500	69.6	127.0	51.3	67.5	72.5	82.4	68.7	16.4
247	Chlorobenzilate	0.0125	109.8	94.5	120.3	95.0	91.1	87.1	99.6	12.7	0.0250	93.4	109.4	116.7	98.9	90.9	115.3	104.1	10.8	0.1250	97.3	116.7	105.6	101.9	76.8	89.4	97.9	14.1
248	Uniconazole	0.0250	32.9	92.9	120.9	129.6	85.2	92.5	104.2	18.9	0.0500	122.5	126.8	106.8	115.7	121.4	28.7	118.6	6.5	0.2500	106.7	115.5	116.8	97.5	78.8	89.3	100.8	15.0
249	Flusilazole	0.0375	97.2	101.5	104.2	91.8	131.1	86.8	102.1	15.2	0.0750	97.7	102.0	112.9	93.5	87.6	87.2	96.8	10.1	0.3750	95.5	111.4	99.7	100.2	80.0	89.6	96.0	11.1
250	Fluorodifen	0.0125	121.9	103.6	142.7	133.5	90.9	83.4	112.7	21.1	0.0250	116.9	127.4	159.6	154.0	100.6	90.4	124.8	22.4	0.1250	90.5	112.9	100.0	91.4	75.0	72.9	90.5	16.7
251	Diniconazole	0.0375	90.9	95.0	132.4	91.9	75.0	56.7	81.9	19.6	0.0750	88.0	98.3	114.1	101.5	87.8	63.2	92.2	18.6	0.3750	91.3	118.0	104.5	99.9	75.2	80.9	95.0	16.7
252	Piperonyl butoxide	0.0125	110.1	101.5	129.8	100.7	83.5	85.5	101.8	16.7	0.0250	91.6	102.6	106.9	109.2	90.4	80.9	96.9	11.4	0.1250	96.7	150.2	104.4	104.3	80.2	92.5	104.7	22.9
253	Propargite	0.0250	52.0	68.4	65.6	110.8	88.1	88.2	72.5	21.5	0.0500	89.3	76.0	79.7	77.6	116.5	106.6	90.9	18.6	0.2500	99.0	114.9	85.3	80.2	68.4	84.4	88.7	18.2
254	Mepronil	0.0125	214.6	101.1	154.8	101.0	96.7	81.4	95.1	9.8	0.0250	98.5	104.0	101.2	129.4	87.2	90.8	101.9	14.7	0.1250	106.8	114.0	112.4	99.8	77.7	83.6	99.1	15.3
255	Dimefuron	0.0500	54.4	116.0	110.2	124.1	115.1	60.6	96.7	31.8	0.1000	70.5	82.9	60.0	91.4	55.0	52.9	68.8	22.8	0.5000	83.7	168.3	54.3	94.9	85.1	63.5	76.3	22.0
256	Diflufenican	0.0125	98.8	99.0	105.8	99.7	88.7	82.9	95.8	8.7	0.0250	97.2	101.2	105.6	114.1	92.7	96.7	101.3	7.6	0.1250	94.8	114.7	99.5	105.0	83.3	91.2	98.1	11.2
257	Fenazaquin	0.0125	68.7	59.4	93.9	70.5	63.4	56.4	68.7	19.5	0.0250	94.1	98.1	152.5	107.3	88.7	94.9	105.9	22.3	0.1250	86.8	86.4	86.4	77.6	48.5	72.4	76.4	19.5
258	Phenothrin	0.0125	128.2	89.6	99.2	95.6	87.8	92.7	98.8	15.1	0.0250	83.9	92.2	115.7	110.2	98.6	101.5	100.3	11.6	0.1250	91.1	111.3	94.8	103.6	83.5	97.1	96.9	10.0
259	Fludioxonil	0.0125	82.5	81.2	84.6	98.2	81.3	83.6	85.2	7.6	0.0250	87.3	109.3	120.8	103.7	72.8	115.5	101.6	17.9	0.1250	76.9	100.9	75.3	99.9	80.3	74.1	84.6	14.7
260	Fenoxycarb	0.0750	5.8	68.8	138.5	110.6	119.7	106.5	108.8	23.5	0.1500	74.3	61.6	42.7	89.5	69.1	85.2	70.4	24.1	0.7500	42.6	102.9	33.5	90.4	79.5	96.4	92.3	10.8
261	Sethoxydim	0.1125	51.3	43.7	84.7	62.2	54.4	64.7	60.2	23.6	0.2250	61.2	63.8	104.6	72.0	58.6	107.1	77.9	28.4	1.1250	62.6	82.7	58.1	92.8	48.2	76.5	70.1	23.8
262	Anilofos	0.0500	115.9	101.4	162.7	100.1	73.0	79.2	93.9	18.7	0.1000	108.7	112.1	148.0	76.5	116.0	88.6	108.3	22.8	0.5000	101.1	118.7	114.6	105.9	77.2	94.7	102.0	14.7
263	Acrinathrin	0.0250	94.4	79.7	132.2	104.9	95.2	92.2	99.8	17.9	0.0500	133.4	140.0	182.4	132.6	143.9	198.3	155.1	18.1	0.2500	85.9	109.5	96.4	109.1	109.4	94.8	100.8	9.9
264	Lambda-cyhalothrin	0.0125	80.3	99.5	98.7	101.3	92.4	95.7	94.7	8.1	0.0250	102.8	111.1	414.1	139.0	102.9	143.0	119.8	16.5	0.1250	95.2	116.3	98.9	113.8	88.2	88.2	100.1	12.3
265	Mefenacet	0.0375	86.7	101.7	99.1	95.5	82.9	74.1	90.0	11.8	0.0750	88.0	104.8	206.0	75.4	83.2	144.0	87.9	14.2	0.3750	80.7	115.0	87.6	101.7	78.9	88.2	92.0	15.0
266	Permethrin	0.0250	85.8	97.5	93.2	100.9	93.0	92.9	93.9	5.4	0.0500	88.2	105.8	104.4	124.7	86.3	97.6	101.2	13.9	0.2500	88.3	114.7	91.8	102.9	84.4	95.3	96.2	11.5
267	Pyridaben	0.0125	83.7	96.2	93.9	83.8	68.6	68.0	82.4	14.6	0.0250	89.3	103.9	121.7	79.5	243.3	68.3	92.5	22.6	0.1250	87.7	117.9	92.2	100.7	80.8	92.6	95.3	13.5
268	Fluoroglycofen-ethyl	0.1500	107.9	97.1	125.8	95.8	88.7	78.3	98.9	16.6	0.3000	104.3	105.0	169.4	76.7	120.3	64.4	94.1	24.3	1.5000	85.3	129.1	90.4	109.3	82.0	90.0	97.7	18.5
269	Bitertanol	0.0375	76.8	96.9	92.0	90.1	84.5	67.1	84.6	13.0	0.0750	130.5	134.1	94.8	108.4	133.9	75.2	112.8	21.6	0.3750	82.7	114.8	92.3	103.2	70.6	82.5	91.0	17.5
270	Etofenprox	0.0125	82.3	166.2	91.6	102.2	97.0	98.9	94.4	8.2	0.0250	72.4	80.6	86.9	123.8	100.7	110.3	95.8	20.2	0.1250	82.0	114.2	84.4	102.2	85.9	96.5	94.2	13.3
271	Cycloxydim	0.1500	71.4	43.0	31.1	63.4	79.3	60.9	58.2	30.9	0.3000	65.2	50.5	58.2	66.9	47.5	53.8	57.0	13.8	1.5000	65.4	66.6	52.9	80.1	33.6	74.3	67.9	15.1
272	Flucythrinate	0.0250	74.7	230.5	100.7	117.5	97.0	90.1	96.0	16.3	0.0500	53.5	8.2	51.6	63.6	53.0	53.1	55.0	8.9	0.2500	60.9	77.0	85.6	67.7	88.2	77.7	76.2	13.7
273	Esfenvalerate	0.0250	82.5	89.3	102.4	107.3	103.3	99.2	97.3	9.7	0.0500	95.5	99.5	93.1	84.0	91.3	74.0	89.6	10.3	0.2500	79.6	114.6	69.3	100.6	82.4	91.1	89.6	18.1
274	alpha-Cypermethrin	0.0500	72.9	97.7	81.7	101.3	90.5	89.3	88.9	11.7	0.1000	106.6	105.7	107.4	225.1	104.9	127.3	110.4	8.6	0.5000	77.1	101.8	82.3	97.6	77.9	92.2	88.2	11.9
275	Difenconazole	0.0750	92.4	66.0	171.2	84.5	79.0	97.2	83.8	14.5	0.1500	122.4	132.6	123.8	112.2	109.9	93.3	115.7	11.9	0.7500	59.1	91.7	65.6	97.6	77.5	85.7	79.5	18.9
276	Flumioxazin	0.0250	99.8	57.4	103.8	111.2	121.6	68.6	93.7	26.9	0.0500	110.5	116.8	113.3	126.2	121.9	76.2	110.8	16.2	0.2500	90.1	106.3	78.9	93.8	78.2	78.0	87.6	13.0
277	Flumiclorac-pentyl	0.0250	73.9	89.2	83.5	97.6	91.3	87.0	87.1	9.2	0.0500	113.0	104.3	111.8	108.0	118.8	74.9	105.1	14.9	0.2500	80.1	112.0	88.6	107.4	84.3	91.7	94.0	13.7
278	Dimefox	0.0375	83.3	66.0	59.1	58.0	67.1	59.5	65.5	14.5	0.0750	74.3	71.9	63.5	66.1	48.7	37.2	60.3	23.9	0.3750	124.0	96.8	102.9	112.8	123.5	97.0	109.5	11.4
279	Disulfoton-sulfoxide	0.0250	116.4	103.0	112.4	86.8	107.4	81.6	101.3	13.9	0.0500	115.7	114.6	124.6	108.1	100.7	64.1	104.6	20.5	0.2500	115.4	97.1	117.7	109.1	110.8	81.3	81.3	13.1
280	Pentachlorobenzene	0.0125	83.5	92.4	53.1	68.3	81.1	78.3	76.1	18.0	0.0250	86.8	93.0	75.1	75.6	64.9	53.2	74.8	19.3	0.1250	96.5	95.7	93.0	102.7	117.3	105.0	101.7	8.7
281	Tri-iso-butyl phosphate	0.0125	112.5	108.6	123.9	54.5	99.5	73.6	103.6	18.3	0.0250	115.2	105.8	135.8	95.6	84.7	63.5	100.1	25.0	0.1250	121.3	115.0	108.7	112.9	110.4	113.7	113.7	3.8
282	Crimidine	0.0125	124.5	104.3	108.0	79.1	87.2	66.0	94.9	22.5	0.0250	112.9	106.6	117.5	85.0	76.7	61.0	93.3	24.1	0.1250	115.5	102.8	111.9	98.5	83.8	108.3	103.5	11.0
283	BDMC-1	0.0500	123.9	80.6	107.1	99.4	83.2	71.5	94.3	20.7	0.1000	78.0	131.9	78.3	113.3	106.7	74.0	97.0	24.4	0.5000	115.8	102.3	120.1	110.1	118.2	114.7	113.5	5.7
284	Chlorfenprop-methyl	0.0125	92.4	100.5	84.9	87.2	95.0	103.4	93.9	7.7	0.0250	104.3	109.6	103.0	91.3	71.9	65.8	91.0	20.0	0.1250	111.9	98.2	107.6	109.2	120.8	120.8	111.4	7.7
285	Thionazin	0.0125	89.2	106.1	123.8	83.1	97.1	110.6	101.7	14.7	0.0250	124.2	112.6	133.1	96.9	86.5	93.2	107.7	17.2	0.1250	120.3	112.9	114.7	107.0	108.4	115.1	113.0	4.3

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
286	2,3,5,6-Tetrachloroaniline	0.0125	112.4	88.5	95.6	83.4	97.5	92.5	95.0	10.5	0.0250	104.6	107.3	105.9	94.4	80.5	66.0	93.1	17.9	0.1250	106.5	102.9	109.9	107.4	114.0	117.9	109.8	4.9
287	Tri-*n*-butyl phosphate	0.0250	136.2	124.9	139.9	95.2	114.4	86.3	116.1	18.8	0.0500	125.0	115.2	74.8	105.2	87.8	64.6	95.4	24.8	0.2500	116.9	101.7	119.5	101.6	106.7	118.4	110.8	7.6
288	2,3,4,5-Tetrachloroanisole	0.0125	109.9	98.6	93.4	84.9	98.7	94.2	96.6	8.5	0.0250	105.9	105.9	110.0	96.6	81.0	68.8	94.7	17.3	0.1250	109.3	104.1	111.2	107.8	113.1	116.6	110.3	3.9
289	Pentachloroanisole	0.0125	108.8	97.3	93.4	82.0	95.0	88.9	94.3	9.5	0.0250	105.0	109.7	106.6	94.0	79.4	67.2	93.7	18.2	0.1250	105.7	99.8	106.7	108.5	113.9	114.5	108.2	5.1
290	Tebutam	0.0250	116.7	99.2	110.9	90.9	100.0	96.5	102.4	9.4	0.0500	117.0	110.9	121.9	105.2	80.7	70.8	101.1	20.5	0.2500	117.1	102.8	115.0	108.5	113.9	115.1	112.1	4.8
291	Dioxabenzofos	0.1250	116.2	103.5	107.0	90.8	99.6	79.9	99.5	12.8	0.2500	112.8	119.5	117.9	98.9	86.1	62.7	99.6	22.2	1.2500	117.4	104.3	112.1	109.6	116.1	113.8	112.2	4.3
292	Methabenzthiazuron	0.1250	184.4	125.7	199.2	92.4	88.3	64.2	92.7	27.3	0.2500	116.9	121.7	119.7	93.2	73.2	66.2	98.5	25.0	1.2500	117.3	97.1	116.7	101.1	103.7	105.8	107.0	7.8
293	Simeton	0.0250	128.3	112.0	125.4	87.9	93.6	64.1	101.9	24.2	0.0500	122.9	113.2	106.8	94.4	71.9	62.5	95.3	25.0	0.2500	119.0	99.4	117.7	100.1	97.2	93.5	104.5	10.5
294	Atratone	0.0125	121.4	93.9	116.9	95.4	98.5	80.0	101.0	15.3	0.0250	123.1	114.2	106.2	97.7	74.8	59.9	96.0	25.2	0.1250	116.5	98.7	115.6	100.4	101.3	98.2	105.1	8.1
295	Desisopropyl-atrazine	0.1000	102.8	100.0	93.8	88.8	91.6	38.0	95.4	6.1	0.2000	118.8	106.6	110.8	92.5	84.3	37.9	102.6	13.6	1.0000	105.8	96.9	110.9	94.0	88.0	50.4	99.1	9.3
296	Terbufos sulfone	0.0125	127.0	103.5	120.7	89.2	103.7	97.9	107.0	13.3	0.0250	116.0	107.1	124.9	101.8	87.6	72.5	101.7	18.8	0.1250	113.8	103.5	113.4	109.3	115.1	117.8	112.1	4.5
297	Tefluthrin	0.0125	123.4	103.2	123.1	95.2	103.8	108.1	109.5	10.5	0.0250	116.4	113.7	122.1	108.3	91.8	81.0	105.6	15.0	0.1250	117.5	106.0	118.6	109.3	114.7	122.1	114.7	5.3
298	Bromocylen	0.0125	109.5	102.9	105.5	86.3	108.9	87.3	100.1	10.5	0.0250	107.1	109.1	114.1	99.0	86.5	72.6	98.1	16.1	0.1250	109.3	104.3	110.1	109.6	115.3	115.4	110.7	3.8
299	Trietazine	0.0125	120.4	105.0	126.7	90.2	98.6	91.7	105.5	14.3	0.0250	118.5	116.9	130.9	107.9	82.1	71.0	104.5	22.2	0.1250	116.3	123.9	121.1	107.4	107.4	113.0	114.8	6.0
300	Etrimfos oxon	0.0125	126.9	104.9	124.4	93.0	104.7	96.5	108.4	13.1	0.0250	119.2	113.3	126.3	108.1	88.1	72.7	104.6	19.4	0.1250	116.7	104.8	115.1	108.5	113.4	117.8	112.7	4.5
301	Cycluron	0.0375	367.9	84.6	492.7	91.2	134.9	70.2	95.2	29.2	0.0750	318.4	93.3	323.0	101.9	66.8	65.4	81.9	22.6	0.3750	98.4	83.5	94.8	87.2	94.7	92.0	91.8	6.0
302	2,6-Dichlorobenzamide	0.0250	120.0	94.3	128.3	87.5	94.5	34.0	104.9	17.2	0.0500	114.9	109.7	116.3	111.7	89.5	31.8	108.4	10.0	0.2500	93.4	101.5	114.2	99.9	97.1	38.3	101.2	7.8
303	DE-PCB 28	0.0125	61.0	92.1	50.8	46.9	78.9	61.2	65.2	26.5	0.0250	94.0	129.8	75.3	430.7	645.6	99.0	99.5	22.7	0.1250	78.4	75.3	87.8	52.3	50.9	63.3	68.0	21.9
304	DE-PCB 31	0.0125	114.1	99.4	110.1	51.1	104.7	104.2	97.2	23.8	0.0250	110.2	112.8	73.5	61.6	78.3	74.5	85.2	24.9	0.1250	115.6	108.0	125.3	120.9	124.5	136.0	121.7	7.8
305	Desethyl-sebuthylazine	0.0250	119.0	106.9	117.3	91.7	104.1	67.4	101.1	19.0	0.0500	119.9	109.0	124.5	100.0	94.2	54.4	109.5	11.7	0.2500	114.1	99.5	115.3	102.3	105.5	72.5	101.6	15.3
306	2,3,4,5-Tetrachloroaniline	0.0250	100.6	93.1	103.1	74.2	101.4	72.5	90.8	15.4	0.0500	109.1	89.6	119.1	97.5	82.0	63.6	93.5	21.2	0.2500	105.9	94.7	109.9	104.7	114.1	116.3	107.6	7.2
307	Musk ambrette	0.0125	125.6	117.3	129.6	81.9	100.7	92.8	108.0	17.7	0.0250	128.2		144.5	110.0	93.1	75.4	110.3	24.9	0.1250	120.3	118.9	119.2	106.2	107.7	112.0	114.1	5.5
308	Musk xylene	0.0125	121.3	91.6	130.0	78.9	98.5	88.4	101.5	19.7	0.0250	125.8		140.8	112.5	96.6	75.7	110.3	22.9	0.1250	115.8	115.5	114.3	105.4	108.3	111.4	111.8	3.8
309	Pentachloroaniline	0.0125	130.5	97.1	112.9	94.3	117.3	115.4	111.2	12.2	0.0250	109.9	109.9	126.5	106.9	84.3	72.8	101.7	19.2	0.1250	113.6	102.4	114.0	108.6	112.4	115.9	111.1	4.4
310	Aziprotryne	0.1000	140.2	102.0	118.8	95.7	117.5	94.6	111.5	15.8	0.2000	131.9	110.1	129.9	114.7	100.1	70.6	109.5	20.6	1.0000	124.1	107.7	119.6	113.2	121.3	126.0	118.6	5.9
311	Sebutylazine	0.0125	116.5	104.4	119.2	90.6	107.2	91.8	104.9	11.4	0.0250	118.6	113.0	129.1	106.1	84.3	67.1	103.0	22.4	0.1250	115.5	101.1	115.9	105.7	109.8	110.1	109.7	5.2
312	Isocarbamid	0.0625	109.7	98.2	112.1	90.5	105.0	53.0	103.1	8.5	0.1250	117.3	103.9	121.2	94.7	95.3	47.1	106.5	11.5	0.6250	99.3	98.9	114.2	98.9	94.0	66.9	101.1	7.6
313	DE-PCB 52	0.0125	114.8	103.7	116.4	89.6	102.0	109.4	106.0	9.3	0.0250	108.5	119.1	114.3	111.0	93.3	78.8	104.2	14.6	0.1250	113.3	101.1	116.0	107.2	113.0	117.8	111.4	5.6
314	Musk moskene	0.0125	120.8	112.6	126.0	83.7	100.8	92.2	106.0	15.7	0.0250	123.6	109.8	138.6	115.3	97.2	77.4	110.3	19.3	0.1250	120.1	116.8	115.3	106.6	108.3	112.7	113.3	4.6
315	Prosulfocarb	0.0125	114.5	105.0	113.0	96.2	105.2	105.6	106.6	6.2	0.0250	120.6	113.4	127.9	106.4	90.6	77.4	106.1	17.9	0.1250	117.2	100.1	115.0	107.1	113.3	119.3	112.0	6.4
316	Dimethenamid	0.0125	118.5	106.4	119.3	92.7	104.8	94.3	106.0	10.7	0.0250	115.0	115.6	124.8	107.5	85.4	69.6	103.0	20.5	0.1250	115.2	98.0	115.3	107.3	113.8	111.3	110.1	6.1
317	Fenchlorphos oxon	0.0250	114.0	105.7	114.2	94.0	109.9	100.1	106.3	7.6	0.0500	114.7	112.0	122.7	111.4	92.1	73.5	104.4	17.4	0.2500	115.5	98.9	113.2	110.6	115.5	118.0	112.0	6.1
318	BDMC-2	0.0250	73.5	129.3	67.8	87.6	106.2	62.6	87.8	29.3	0.0500	60.4	101.2	63.3	99.1	88.7	53.3	77.7	27.2	0.2500	116.4	100.7	110.8	107.8	110.0	97.6	107.2	6.5
319	Paraoxon-methyl	0.1000	117.9	105.2	116.4	86.7	106.2	99.2	105.3	11.0	0.2000	105.9	102.1	125.0	105.8	87.2	70.2	99.3	18.8	1.0000	104.2	86.4	101.5	105.2	103.4	58.5	93.2	19.7
320	Monalide	0.0250	120.4	101.3	120.1	95.7	107.5	94.3	106.6	10.9	0.0500	120.4	123.4	126.1	109.6	88.4	68.7	106.1	21.6	0.2500	117.7	100.7	118.7	111.2	115.6	113.7	112.9	5.8
321	Musk tibeten	0.0125	112.6	141.3	123.1	96.1	100.9	92.9	111.2	16.7	0.0250	124.0	138.8	135.8	111.0	96.8	76.7	113.8	21.1	0.1250	119.1	113.5	114.4	108.3	110.2	112.5	113.0	3.3
322	Isobenzan	0.0125	108.6	104.6	110.9	90.8	107.2	86.4	101.4	10.1	0.0250	105.4	113.1	114.0	108.9	91.0	79.1	101.9	13.7	0.1250	113.7	98.2	114.3	110.0	114.0	117.5	111.3	6.1
323	Octachlorostyrene	0.0125	94.0	98.8	100.6	92.6	104.7	108.7	99.9	6.2	0.0250	102.7	109.6	111.4	106.3	88.6	79.1	99.6	13.0	0.1250	108.3	96.9	110.6	108.3	108.6	117.7	108.4	6.2
324	Pyrimitate	0.0125	86.2	100.3	109.2	92.3	113.2	84.2	97.6	12.3	0.0250	105.7	85.3	102.0	87.8	86.4	76.9	90.7	12.1	0.1250	117.7	106.1	100.8	109.6	104.9	82.5	103.6	11.4
325	Isodrin	0.0125	124.5	76.7	133.3	90.7	100.6	64.4	98.4	27.3	0.0250	195.0	95.7	137.7	136.8	110.6	113.5	118.9	15.2	0.1250	104.0	96.7	110.0	109.6	122.7	118.2	110.2	8.5
326	Isomethiozin	0.0250	92.8	96.8	105.1	69.6	77.7	29.6	88.4	16.3	0.0500	108.2	94.3	120.3	75.2	61.2	68.7	88.0	26.6	0.2500	101.2	78.4	90.9	98.1	96.9	74.2	89.9	12.4
327	Trichloronat	0.0125	115.2	109.4	120.9	87.7	106.7	102.0	107.0	10.8	0.0250	116.8	114.5	128.1	110.1	95.7	77.9	107.2	16.6	0.1250	114.6	98.4	112.7	109.5	112.6	116.7	110.8	5.9
328	Dacthal	0.0125	117.9	105.9	118.0	95.8	106.1	101.4	107.5	8.3	0.0250	116.9	118.7	122.8	113.4	89.9	72.8	105.8	18.8	0.1250	119.6	108.6	120.0	111.7	115.9	119.7	115.9	4.2
329	4,4-Dichlorobenzophenone	0.0125	108.2	107.3	105.0	94.3	105.6	100.1	103.4	5.1	0.0250	115.6	114.2	113.7	126.0	91.3	78.8	106.6	16.6	0.1250	120.2	101.2	117.4	107.0	111.3	117.0	112.4	6.4
330	Nitrothal-isopropyl	0.0250	127.2	110.8	134.9	81.7	112.2	103.9	111.8	16.7	0.0500	130.2	108.3	147.2	119.4	90.6	67.0	110.5	25.9	0.2500	122.6	110.4	115.6	109.3	114.0	116.1	114.6	4.2
331	Musk ketone	0.0125	113.6	102.5	122.6	79.2	102.1	93.1	102.2	14.9	0.0250	118.9	112.9	133.7	116.1	94.1	72.9	108.1	19.8	0.1250	119.0	118.3	115.4	105.3	106.5	107.6	112.0	5.6
332	Rabenzazole	0.0125	83.0	72.7	103.9	83.7	117.3	91.6	92.0	17.5	0.0250	88.0	122.6	77.2	106.8	76.4	67.4	89.7	23.4	0.1250	113.0	84.0	104.9	98.2	81.7	61.8	90.6	20.5
333	Cyprodinil	0.0125	115.4	104.8	112.9	90.6	103.6	80.0	101.2	13.4	0.0250	113.5	115.2	116.5	102.4	70.3	66.2	97.3	23.8	0.1250	117.1	102.6	113.9	102.7	103.7	109.5	108.3	5.8

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
334	Fuberidazole	0.0625	55.4	45.3	82.7	70.8	7.9	23.6	63.5	25.9	0.1250	121.9	55.5	95.9	70.4	11.8	17.2	85.9	34.0	0.6250	147.2	156.5	130.3	94.2	30.0	37.5	132.1	20.8
335	Isofenphos oxon	0.0250	90.7	73.6	52.3	76.1	89.6	44.2	71.1	26.9	0.0500	50.0	66.4	85.5	69.2	50.0	59.8	63.5	21.2	0.2500	56.6	58.0	62.6	46.8	40.7	59.6	54.0	15.7
336	Dicapthon	0.0625	127.8	111.2	127.1	90.5	121.1	84.5	110.4	17.0	0.1250	117.1	108.9	128.8	103.9	89.7	56.2	100.8	25.3	0.6250	117.0	98.6	108.7	106.9	113.5	108.5	108.9	5.8
337	DE-PCB 101	0.0125	110.2	103.5	108.8	95.3	108.0	108.4	105.7	5.3	0.0250	110.2	114.1	117.9	109.2	92.7	79.9	104.0	14.0	0.1250	115.2	99.0	114.6	108.7	112.4	118.1	111.3	6.1
338	MCPA-butoxyethyl ester	0.0125	114.4	109.4	131.4	95.2	99.4	87.2	106.2	14.8	0.0250	115.7	115.7	123.3	109.0	97.6	75.0	106.1	16.5	0.1250	118.5	101.5	114.3	111.9	116.1	120.6	113.8	5.9
339	Isocarbophos	0.0250	112.8	85.7	117.1	91.2	105.6	74.9	97.9	16.9	0.0500	106.4	796.9	114.8	105.9	94.4	60.9	96.5	22.0	0.2500	121.8	112.4	114.8	109.8	107.5	83.6	108.3	12.1
340	Phorate sulfone	0.0125	119.8	103.2	122.3	94.8	115.8	81.4	106.2	15.1	0.0250	125.7	111.7	134.8	106.2	98.7	59.9	106.2	24.7	0.1250	117.2	100.0	113.3	109.7	114.0	88.9	107.2	10.0
341	Chlorfenethol	0.0125	129.7	105.2	135.3	94.5	110.0	101.4	112.7	14.4	0.0250	119.8	115.2	130.7	110.8	89.9	68.2	105.8	21.5	0.1250	116.3	101.1	114.0	107.6	113.1	110.1	110.4	5.0
342	*trans*-Nonachlor	0.0125	109.9	104.8	113.2	94.1	109.9	109.4	106.9	6.4	0.0250	110.8	114.7	118.6	108.9	93.5	76.4	103.8	15.3	0.1250	114.4	100.5	114.5	109.5	116.6	117.0	112.1	5.6
343	Dinobuton	0.2500	86.3	61.2	72.3	80.6	66.2	57.1	70.6	16.0	0.5000	97.0	84.0	74.7	103.9	121.5	102.6	97.3	16.9	2.5000	137.2	95.2	141.9	103.0	118.8	109.0	117.5	16.0
344	DEF	0.0250	129.9	95.5	152.1	47.2	150.0	125.8	130.7	17.5	0.0500	111.7	89.6	187.2	90.2	82.6	63.9	87.6	19.6	0.2500	112.3	232.7	118.7	109.4	113.9	115.4	113.9	3.0
345	Flurochloridone	0.0250	112.7	105.0	119.5	93.9	113.2	87.7	105.3	11.7	0.0500	108.9	115.5	119.9	108.0	92.1	60.9	100.9	21.5	0.2500	117.8	105.0	115.8	108.1	113.7	99.5	110.0	6.4
346	Bromfenvinfos	0.0125	116.2	103.8	183.3	96.5	123.4	103.8	108.7	9.9	0.0250	119.7	113.5	159.5	105.7	92.9	69.7	100.3	19.8	0.1250	112.5	98.0	112.5	108.5	113.4	109.4	109.1	5.3
347	Perthane	0.0125	86.9	107.8	92.3	96.0	116.1	108.4	101.2	11.1	0.0250	96.7	114.8	107.4	109.9	94.6	75.2	99.8	14.3	0.1250	115.4	103.4	117.8	108.5	114.4	116.4	112.6	4.9
348	Ditalimfos	0.0125	80.4	52.8	67.3	77.1	61.9	59.6	66.5	15.9	0.0250	70.0	61.7	82.8	59.6	70.1	58.3	67.1	13.8	0.1250	54.0	87.6	66.2	74.3	70.9	61.7	69.1	16.7
349	DE-PCB 118	0.0125	101.0	111.0	132.6	91.9	121.3	113.3	111.8	12.9	0.0250	105.1	117.7	110.8	107.9	89.4	74.9	101.0	15.7	0.1250	113.4	98.3	112.3	106.6	111.2	115.9	109.6	5.8
350	4,4-Dibromobenzophenone	0.0250	95.9	106.2	108.2	93.0	87.2	81.3	100.8	7.4	0.0500	103.6	114.1	109.4	98.7	90.2	89.7	101.0	9.9	0.2500	114.0	98.6	110.5	105.6	116.0	113.2	109.7	5.9
351	Flutriafol	0.0250	114.6	107.5	122.4	87.0	110.9	64.9	101.2	21.1	0.0500	100.9	106.9	105.7	115.5	96.7	60.0	97.6	20.0	0.2500	112.1	96.3	113.5	107.9	110.8	72.4	102.2	15.5
352	Mephosfolan	0.0250	87.0	103.3	101.8	92.7	147.8	89.9	103.8	21.7	0.0500	105.8	107.1	118.4	85.4	108.0	55.3	96.7	23.7	0.2500	101.9	93.0	109.2	102.7	102.9	67.2	96.1	15.7
353	Athidathion	0.0250	127.8	108.0	95.1	124.8	113.5	88.4	109.6	14.4	0.0500	107.3	99.5	104.0	115.2	91.7	83.9	100.3	11.2	0.2500	111.7	90.9	113.3	104.7	109.8	119.3	108.3	9.0
354	DE-PCB 153	0.0125	101.9	100.8	107.4	95.6	106.8	109.0	103.6	4.9	0.0250	107.5	113.8	113.7	109.6	87.1	77.1	101.5	15.3	0.1250	110.5	100.9	112.8	106.7	107.6	115.4	109.0	4.7
355	Diclobutrazole	0.0500	115.4	100.4	118.4	86.1	120.5	92.4	105.5	13.8	0.1000	101.5	110.9	113.6	110.7	88.4	69.0	99.0	17.6	0.5000	113.0	101.4	111.3	104.1	108.1	99.4	106.2	5.1
356	Disulfoton sulfone	0.0250	90.2	107.1	98.1	93.5	117.4	86.7	98.8	11.6	0.0500	103.3	114.2	109.8	107.3	100.2	58.1	98.8	20.8	0.2500	114.8	104.5	114.3	109.3	112.1	75.2	105.0	14.4
357	Hexythiazox	0.1000	92.5	103.0	90.6	93.3	108.4	104.0	98.7	7.5	0.2000	82.5	112.8	90.5	121.3	84.3	63.9	92.5	22.8	1.0000	113.8	99.5	113.5	111.1	110.3	109.1	109.6	4.8
358	DE-PCB 138	0.0125	22.3	102.6	25.6	88.7	129.4	116.2	109.2	16.0	0.0250	49.7	113.4	57.2	105.0	90.8	68.7	80.8	32.3	0.1250	115.2	107.5	131.8	117.0	123.3	122.0	119.5	6.9
359	Triamiphos	0.0250	63.4	46.8	52.6	33.2	51.0	49.7	49.4	19.8	0.0500	86.2	100.3	120.7	119.5	103.2	83.0	102.2	15.6	0.2500	91.6	111.7	95.6	89.4	85.7	56.3	88.4	20.5
360	Resmethrin-1	0.0250	43.2	77.3	57.6	61.4	74.4	55.2	61.5	20.6	0.0500	62.5	75.7	97.0	75.6	58.6	62.8	72.0	19.7	0.2500	10.2	63.9	97.9	55.4	79.9	77.8	75.0	21.8
361	Cyproconazole	0.0125	94.1	75.0	67.7	78.0	97.8	80.6	82.2	14.1	0.0250	91.5	104.4	96.8	158.2	78.6	62.7	86.8	18.9	0.1250	102.2	93.2	107.6	101.9	104.1	99.3	101.4	4.8
362	Resmethrin-2	0.0250	59.5	106.2	84.1	61.1	74.5	57.4	67.3	17.1	0.0500	69.0	83.7	112.0	63.5	76.3	67.4	78.7	22.7	0.2500	9.9	68.9	99.9	54.3	80.6	102.3	81.2	25.1
363	Phthalic acid,benzyl butyl ester	0.0125	114.7	99.1	109.2	92.7	114.8	111.5	107.0	8.5	0.0250	114.4	110.9	129.0	110.1	90.4	70.5	104.2	19.8	0.1250	114.2	104.4	114.1	106.3	113.8	112.1	110.8	3.9
364	Clodinafop-propargyl	0.0250	105.5	111.0	117.6	86.6	119.0	86.0	104.3	14.1	0.0500	103.6	110.4	124.0	102.1	87.9	53.4	96.9	25.1	0.2500	114.1	109.6	108.0	105.9	109.7	94.5	107.0	6.3
365	Fenthion sulfoxide	0.0500	71.9	97.0	73.0	93.0	146.9	90.4	85.1	13.8	0.1000	85.0	142.8	83.7	99.6	89.1	62.4	84.0	16.2	0.5000	102.6	89.4	114.0	106.3	106.8	71.5	98.4	15.7
366	Fluotrimazole	0.0125	87.6	100.9	88.7	76.5	90.1	59.6	83.9	16.9	0.0250	99.8	105.5	100.7	77.9	57.6	58.5	83.3	26.1	0.1250	107.0	91.3	99.9	105.4	111.5	91.5	101.1	8.3
367	Fluroxypr-1-methylheptyl ester	0.0250	82.7	102.3	79.6	96.9	98.4	71.7	88.6	13.9	0.0500	97.0	117.2	112.2	107.6	88.6	106.3	104.8	9.9	0.2500	110.5	96.6	109.7	109.0	113.7	111.2	108.4	5.6
368	Fenthion sulfone	0.0500	100.2	109.2	110.7	91.3	114.9	58.2	97.4	21.6	0.1000	113.1	114.4	123.3	101.5	88.0	46.4	108.1	12.6	0.5000	107.1	97.6	109.5	104.8	112.8	57.2	98.2	21.1
369	Triphenyl phosphate	0.0125	96.8	104.7	98.4	95.5	114.3	98.5	101.4	7.0	0.0250	100.8	113.8	105.1	117.1	85.3	65.8	98.0	19.7	0.1250	115.8	101.9	115.2	107.5	113.5	106.1	110.0	5.2
370	Metamitron	0.5000	125.3	256.5	149.1	356.2	113.1	86.8	118.6	21.9	1.0000	163.8	255.5	173.2	101.7	160.4	54.5	130.7	39.1	5.0000	118.6	217.4	116.0	120.3	127.9	74.9	111.5	18.8
371	DE-PCB 180	0.0125	75.5	96.8	96.5	95.7	107.0	108.8	96.7	12.3	0.0250	99.8	112.8	108.5	108.6	85.0	75.7	98.4	15.1	0.1250	106.2	95.7	109.6	104.3	104.4	112.0	105.4	5.3
372	Tebufenpyrad	0.0125	81.0	103.0	85.7	99.1	113.9	107.2	98.3	12.9	0.0250	112.1	115.0	106.9	109.9	85.3	73.2	100.4	17.0	0.1250	112.8	97.1	112.6	106.4	112.2	111.9	108.8	5.7
373	Cloquintocet-mexyl	0.0125	72.5	105.3	68.8	87.0	117.0	84.0	89.1	21.0	0.0250	68.0	109.7	70.8	79.3	62.8	58.2	74.8	24.8	0.1250	103.6	84.5	95.2	98.8	101.8	102.7	97.7	7.4
374	Lenacil	0.0125	94.9	98.3	100.0	89.6	107.6	79.7	95.0	10.1	0.0250	99.6	108.7	105.6	99.4	85.7	56.3	92.6	21.0	0.1250	104.9	96.1	111.8	101.7	102.8	76.0	98.9	12.4
375	Bromuconazole-1	0.0250	94.4	83.7	101.0	92.1	118.0	84.1	95.6	13.4	0.0500	128.6	101.8	90.0	86.0	69.3	70.3	91.0	24.4	0.2500	102.3	87.1	107.6	103.0	103.3	101.3	100.8	7.0
376	Desbrom-leptophos	0.0125	100.3	104.5	105.6	92.0	122.8	108.3	105.6	9.6	0.0250	101.6	112.2	114.3	106.1	85.9	66.7	97.8	18.7	0.1250	106.9	96.8	109.7	106.0	111.7	109.4	106.7	4.9
377	Bromuconazole-2	0.0250	93.4	96.0	91.9	90.6	96.4	65.7	89.0	13.1	0.0500	100.6	114.1	101.4	91.6	69.9	59.3	89.5	23.3	0.2500	109.2	93.3	111.2	102.3	103.7	91.1	101.8	8.0
378	Nitralin	0.1250	116.0	101.5	129.7	78.4	121.8	76.3	104.0	21.7	0.2500	135.5	108.7	170.9	105.9	96.3	46.3	123.4	24.5	1.2500	113.4	96.7	112.5	107.6	113.6	65.2	101.5	18.6
379	Fenamiphos sulfoxide	0.0500	77.4	97.0	68.3	86.0	71.3	58.2	76.4	18.0	0.1000	64.2	85.1	87.9	66.0	68.2	56.4	71.3	17.5	0.5000	59.3	106.1	104.6	88.1	77.1	27.7	87.0	22.6
380	Fenamiphos sulfone	0.0500	84.2	107.9	96.1	91.4	100.1	27.3	95.9	9.3	0.1000	100.6	108.2	122.4	93.6	61.4	30.0	97.2	23.3	0.5000	76.6	98.7	118.3	97.6	85.8	23.9	95.4	16.5
381	Fenpiclonil	0.0500	74.7	92.3	74.8	93.4	130.2	69.0	80.8	13.9	0.1000	79.6	101.1	85.3	114.1	73.7	25.3	90.7	18.2	0.5000	94.0	90.7	106.6	101.1	119.0	40.1	102.3	11.0

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
382	Fluquinconazole	0.0125	83.6	103.7	84.2	89.2	135.2	115.1	101.8	20.1	0.0250	79.3	114.7	94.5	104.8	69.4	62.2	87.5	23.6	0.1250	109.1	94.8	114.4	105.0	110.2	86.3	103.3	10.3
383	Fenbuconazole	0.0250	81.0	180.1	78.0	51.6	108.9	68.8	77.6	26.9	0.0500	87.6	102.8	85.2	185.9	114.9	101.0	98.3	12.3	0.2500	106.7	93.4	109.0	103.5	107.9	58.6	96.5	20.1
384	Aminocarb	0.0040	101.0	81.7	183.0	82.3	47.5	72.4	84.4	14.2	0.0080	66.2	95.0	297.0	75.9	66.4	52.2	71.1	22.2	0.0400	92.7	85.5	170.0	58.3	64.9	91.4	78.6	20.2
385	Acephate	0.0200	109.0	53.9	614.0	108.0	94.6	97.9	92.7	24.3	0.0400	85.5	97.6	69.0	57.2	66.3	50.9	71.1	24.7	0.2000	69.0	57.4	337.0	57.3	70.3	63.4	63.5	9.7
386	Omethoate	0.0120	101.1	50.5	113.0	73.6	80.1	68.5	81.1	27.9	0.0240	106.2	75.1	91.0	70.3	56.3	60.2	76.5	24.8	0.1200	72.4	57.6	71.2	77.2	94.5	77.4	75.1	15.9
387	Propamocarb	0.0500	78.1	63.8	86.3	73.8	65.9	108.0	79.3	20.5	0.1000	68.9	92.1	104.0	72.9	56.3	58.0	75.4	25.3	0.5000	62.1	43.8	96.9	60.4	75.9	85.5	70.8	27.1
388	Butocarboxim-sulfoxide	0.0100	81.5	44.0	52.1	68.1	67.7	53.8	61.2	22.3	0.0200	60.3	77.9	99.5	82.1	79.2	58.9	76.3	19.8	0.1000	127.0	115.0	110.0	89.4	93.6	64.0	99.8	22.4
389	Demeton-*s*-methyl sulfoxide	0.0400	108.0	70.7	113.0	103.0	88.2	72.6	92.6	19.7	0.0800	72.0	91.9	119.0	88.1	98.2	75.2	90.7	18.8	0.4000	120.0	124.0	112.0	97.8	87.0	77.4	103.0	18.2
390	Monocrotophos	0.0100	76.8	82.4	68.1	95.3	86.8	94.8	84.0	12.6	0.0200	64.3	108.0	107.0	90.4	89.7	80.2	89.9	18.4	0.1000	90.7	93.0	83.0	97.6	98.9	103.0	94.4	7.5
391	Butoxycarboxim	0.0200	109.0	103.0	118.0	86.0	87.3	99.0	100.4	12.4	0.0400	76.5	108.0	133.0	74.3	86.8	83.5	93.7	24.2	0.2000	101.0	136.0	114.0	87.3	93.0	104.0	105.9	16.4
392	Oxamyl	0.0300	120.0	121.0	151.0	167.0	136.0	108.0	133.8	16.4	0.0600	55.1	80.2	97.4	99.0	82.0	187.0	82.7	21.4	0.3000	67.6	95.6	53.5	76.8	106.0	235.0	79.9	26.4
393	Thiofanox-sulfoxide	0.0120	100.0	55.0	88.3	116.0	86.0	108.0	92.2	23.3	0.0240	65.8	106.0	111.0	96.8	77.7	92.5	91.6	18.7	0.1200	125.0	146.0	82.3	123.0	116.0	121.0	118.9	17.4
394	Demeton-*s*-methyl sulfone	0.0100	107.0	87.7	70.4	109.0	99.4	104.0	96.3	15.3	0.0200	69.7	88.2	80.8	98.0	92.1	99.2	88.0	12.7	0.1000	98.9	116.0	94.8	103.0	106.0	108.0	104.5	7.1
395	Methomyl	0.0500	109.0	70.3	81.7	139.0	139.0	170.0	107.8	29.5	0.1000	62.3	89.8	55.4	101.0	120.0	99.8	88.1	28.1	0.5000	147.0	105.0	75.4	147.0	114.0	125.0	118.9	23.0
396	Vamidothion	0.0060	90.0	118.0	108.0	96.7	84.2	82.8	96.6	14.5	0.0120	63.9	123.0	76.2	90.3	92.2	83.7	88.2	22.6	0.0600	125.0	126.0	112.0	124.0	122.0	102.0	118.5	8.1
397	Metamitron	0.0200	113.0	79.9	99.1	91.8	88.8	106.0	96.4	12.5	0.0400	74.8	96.8	99.6	103.0	92.2	106.0	95.4	11.7	0.2000	106.0	117.0	122.0	101.0	115.0	116.0	112.8	6.9
398	3-Hydroxy carbofuran	0.0100	121.0	133.0	112.0	109.0	146.0	161.0	130.3	15.6	0.0200	65.5	108.0	99.6	110.0	122.0	111.0	102.7	19.1	0.1000	105.0	133.0	103.0	104.0	122.0	126.0	115.5	11.3
399	Ethiofencarb-sulfone	0.0800	81.6	133.0	80.2	99.6	118.0	141.0	108.9	23.8	0.1600	77.7	111.0	99.1	112.0	118.0	125.0	107.1	15.7	0.8000	97.7	115.0	109.0	110.0	124.0	120.0	112.6	8.3
400	Imidacloprid	0.0200	141.0	101.0	135.0	112.0	66.7	142.0	116.3	25.3	0.0400	69.1	105.0	123.0	100.0	93.6	130.0	103.5	21.1	0.2000	110.0	123.0	112.0	101.0	108.0	113.0	111.2	6.5
401	Pirimicarb	0.0030	101.0	80.0	91.5	116.0	94.9	109.0	98.7	13.0	0.0060	66.6	111.0	119.0	103.0	83.2	98.6	96.9	19.8	0.0300	117.0	75.2	98.8	106.0	99.6	109.0	100.9	14.1
402	Thiofanox-sulfone	0.0200	103.0	112.0	95.9	105.0	116.0	129.0	110.2	10.5	0.0400	82.5	125.0	151.0	110.0	110.0	125.0	117.3	19.3	0.2000	106.0	133.0	112.0	104.0	99.8	100.0	109.1	11.5
403	Dimethoate	0.0060	106.0	105.0	81.2	91.6	83.9	72.7	90.1	14.9	0.0120	82.7	140.0	123.0	105.0	103.0	103.0	109.5	18.0	0.0600	135.0	120.0	130.0	91.3	95.4	92.5	110.7	18.0
404	Butocarboxim	0.0400	99.9	99.0	107.0	108.0	112.0	123.0	108.2	8.2	0.0800	100.4	78.6	74.2	102.0	105.0	118.0	96.4	17.3	0.4000	87.2	99.1	91.0	95.3	107.0	117.0	99.4	11.1
405	Triacloprid	0.0060	122.0	121.0	135.0	101.0	101.0	108.0	114.7	11.9	0.0120	68.6	121.0	110.0	124.0	114.0	130.0	111.3	19.8	0.0600	114.0	131.0	133.0	104.0	110.0	97.7	115.0	12.5
406	Aldicarb	0.0400	117.0	93.2	104.0	134.0	130.0	124.0	117.0	13.5	0.0800	75.4	113.0	95.9	87.0	80.2	109.0	93.4	16.4	0.4000	83.0	132.0	92.8	116.0	76.9	119.0	103.3	21.4
407	Imazalil	0.0160	119.0	114.0	121.0	98.3	70.3	2490.0	104.5	20.2	0.0320	61.1	91.9	112.0	108.0	88.1	111.0	95.4	20.5	0.1600	91.9	91.2	99.7	104.0	111.0	416.0	99.6	8.4
408	Demeton-*s*-methyl	0.0200	105.0	74.0	122.0	105.0	96.6	103.0	100.9	15.5	0.0400	53.6	101.0	123.0	110.0	67.2	103.0	93.0	28.7	0.2000	103.0	113.0	148.0	71.1	81.9	64.5	86.7	23.9
409	Propoxur	0.0160	63.0	50.7	74.3	83.3	104.0	82.5	76.3	24.1	0.0320	70.8	95.0	115.0	108.0	104.0	108.0	100.1	15.8	0.1600	115.0	118.0	141.0	110.0	87.3	90.4	110.3	17.9
410	Dioxacarb	0.0004	72.4	53.7	66.9	101.0	107.0	100.0	83.5	26.3	0.0008	71.7	98.7	89.6	106.0	93.4	96.4	92.6	12.6	0.0040	97.0	120.0	141.0	110.0	97.5	91.3	109.5	17.0
411	Thiodicarb	0.0500	71.3	70.9	57.4	30.0	101.0	87.5	77.6	21.7	0.1000	60.5	52.9	83.1	46.4	91.9	95.3	71.7	29.4	0.5000	50.0	65.5	151.0	84.6	100.0	89.7	78.0	25.7
412	Bendiocarb	0.0200	86.5	55.7	63.5	108.0	123.0	109.0	91.0	29.7	0.0400	67.4	124.0	111.0	96.7	92.7	101.0	98.8	19.3	0.2000	57.9	106.0	104.0	108.0	99.4	91.2	94.4	20.0
413	Carbofuran	0.0100	80.9	130.0	96.1	132.0	130.0	156.0	120.8	22.6	0.0200	97.3	182.0	112.0	137.0	122.0	123.0	118.3	12.4	0.1000	86.7	104.0	97.4	144.0	127.0	109.0	111.4	18.7
414	Carbaryl	0.0200	70.0	65.9	77.7	101.0	109.0	101.0	87.4	21.1	0.0400	78.3	98.7	108.0	86.3	80.7	82.5	89.1	13.2	0.2000	81.4	62.0	66.1	50.1	85.8	56.6	67.0	20.9
415	Fosthiazate	0.0040	115.0	132.0	106.0	112.0	110.0	109.0	114.0	8.2	0.0080	84.2	127.0	149.0	116.0	112.0	113.0	116.9	18.1	0.0400	119.0	129.0	107.0	114.0	95.9	109.0	112.3	10.0
416	Atrazine	0.0060	108.0	107.0	122.0	128.0	133.0	119.0	119.5	8.8	0.0120	68.5	105.0	108.0	116.0	107.0	111.0	102.6	16.7	0.0600	117.0	129.0	109.0	109.0	106.0	103.0	112.2	8.4
417	Fenpropimorph	0.0240	101.0	79.6	73.3	81.6	65.6	56.9	76.3	19.9	0.0480	60.6	103.0	75.1	94.9	78.9	63.2	79.3	21.3	0.2400	104.0	101.0	109.0	105.0	97.5	86.1	100.4	8.0
418	Pyrimethanil	0.0160	135.0	111.0	131.0	102.0	105.0	108.0	115.3	12.2	0.0320	56.9	92.5	107.0	100.0	91.6	96.9	90.8	19.3	0.1600	125.0	120.0	115.0	113.0	101.0	104.0	113.0	8.1
419	Ethiofencarb	0.0080	61.9	39.7	60.9	102.0	68.1	96.2	77.8	25.4	0.0160	70.4	63.5	98.3	105.0	58.5	114.0	85.0	27.8	0.0800	52.9	57.6	86.7	91.6	70.1	82.1	73.5	21.6
420	Metalaxyl	0.0020	101.0	386.0	125.0	89.7	72.5	69.4	91.5	24.8	0.0040	61.9	175.0	98.0	105.0	104.0	108.0	95.4	20.0	0.0200	113.0	193.0	108.0	112.0	101.0	111.0	109.0	4.4
421	Isoproturon	0.0100	110.0	107.0	113.0	100.0	200.0	102.0	106.4	5.1	0.0200	91.2	97.5	100.0	115.0	148.0	111.0	110.5	18.5	0.1000	111.0	128.0	109.0	109.0	113.0	111.0	113.5	6.4
422	Spiroxamine	0.0010	113.0	119.0	102.0	99.9	99.7	81.8	102.6	12.5	0.0020	66.4	103.0	90.7	107.0	95.5	76.0	89.8	17.6	0.0100	112.0	118.0	104.0	104.0	109.0	83.9	105.2	11.1
423	Diuron	0.0100	108.0	110.0	79.5	114.0	121.0	120.0	108.8	14.0	0.0200	72.3	119.0	105.0	114.0	104.0	113.0	104.6	16.1	0.1000	119.0	124.0	112.0	110.0	117.0	117.0	116.5	4.3
424	Isoprocarb	0.0500	91.8	97.2	67.5	124.0	112.0	96.6	98.2	19.6	0.1000	65.2	91.0	98.7	97.3	88.8	102.0	90.5	14.7	0.5000	156.0	124.0	102.0	95.1	94.7	95.0	111.1	22.2
425	3,4,5-Trimethacarb	0.0016	94.5	104.0	96.6	102.0	112.0	101.0	101.7	6.1	0.0032	65.3	98.9	95.2	102.0	97.2	94.3	92.2	14.6	0.0160	124.0	134.0	104.0	99.3	98.5	93.0	108.8	15.0
426	Methiocarb	0.0120	54.9	119.0	32.3	132.0	124.0	141.0	129.0	7.5	0.0240	62.7	105.0	122.0	103.0	104.0	104.0	100.1	19.7	0.1200	159.0	156.0	112.0	118.0	113.0	87.6	124.3	22.4
427	Phenmedipham	0.0060	102.0	179.0	97.7	113.0	120.0	57.5	98.0	24.8	0.0120	77.0	95.4	62.2	100.0	132.0	37.7	93.3	28.2	0.0600	160.0	131.0	104.0	97.8	104.0	44.9	119.4	21.9
428	Desmedipham	0.0060	108.0	99.6	86.4	113.0	137.0	31.5	108.8	17.2	0.0120	69.7	116.0	67.2	96.7	74.0	15.8	84.7	24.8	0.0600	116.0	123.0	106.0	112.0	127.0	24.2	116.8	7.2
429	Linuron	0.0160	118.0	195.0	129.0	108.0	122.0	77.0	110.8	18.4	0.0320	73.4	198.0	124.0	106.0	110.0	76.5	98.0	22.5	0.1600	124.0	153.0	131.0	111.0	124.0	81.4	114.3	17.3

Table 4. (*continued*)

No.	Pesticide	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %	Level, mg/kg	Cabbage	Celery	Tomato	Apple	Grape	Orange	Avg.	RSD, %
430	Cyprodinil	0.0160	113.0	547.0	99.1	98.8	98.1	89.1	99.6	8.6	0.0320	70.6	487.0	93.6	120.0	112.0	115.0	102.2	19.9	0.1600	122.0	335.0	130.0	115.0	108.0	104.0	115.8	9.1
431	Promecarb	0.0100	126.0	137.0	118.0	119.0	101.0	99.5	116.8	12.4	0.0200	82.8	188.0	103.0	127.0	130.0	115.0	111.6	17.3	0.1000	193.0	104.0	91.2	112.0	126.0	119.0	110.4	12.2
432	Iprovalicarb	0.0020	82.0	42.7	106.0	135.0	138.0	102.0	112.6	21.0	0.0040	76.9	68.2	105.0	107.0	126.0	83.4	94.4	23.1	0.0200	141.0	109.0	126.0	110.0	128.0	98.9	118.8	13.0
433	Isoxaflutole	0.0400	113.0	58.8	58.9	82.0	102.0	65.3	80.0	29.0	0.0800	83.9	69.2	11.6	113.0	113.0	87.0	93.2	20.7	0.4000	98.2	54.2	124.0	115.0	119.0	86.2	108.5	14.5
434	Azoxystrobin	0.0010	91.3	88.9	67.3	115.0	113.0	109.0	97.4	18.9	0.0020	70.1	115.0	107.0	111.0	105.0	101.0	101.5	15.9	0.0100	116.0	127.0	109.0	109.0	120.0	113.0	115.7	6.0
435	Tebuconazole	0.0040	101.0	107.0	130.0	96.1	106.0	132.0	112.0	13.6	0.0080	65.2	120.0	106.0	109.0	114.0	117.0	105.2	19.3	0.0400	117.0	127.0	106.0	118.0	109.0	126.0	117.2	7.3
436	Primisulfuron-methyl	0.0300	101.0	102.0	94.3	32.8	75.0	98.4	94.1	11.8	0.0600	70.3	116.0	108.0	38.7	73.5	83.2	90.2	22.9	0.3000	98.3	113.0	98.3	11.9	109.0	64.1	96.5	20.0
437	Metolachlor	0.0060	87.9	82.7	101.0	102.0	101.0	78.1	92.1	11.5	0.0120	55.8	162.0	102.0	104.0	118.0	105.0	97.0	24.6	0.0600	130.0	225.0	105.0	112.0	112.0	118.0	115.4	8.1
438	Fenoxycarb	0.0100	112.0	145.0	161.0	108.0	105.0	91.8	120.5	22.1	0.0200	72.2	123.0	96.5	115.0	107.0	112.0	104.3	17.3	0.1000	105.0	119.0	104.0	106.0	110.0	99.9	107.3	6.1
439	Tebufenozide	0.0040	97.6	109.0	123.0	115.0	103.0	105.0	108.8	8.4	0.0080	63.5	106.0	142.0	124.0	107.0	107.0	108.3	24.1	0.0400	102.0	120.0	105.0	103.0	132.0	133.0	115.8	12.5
440	Haloxyfop-methyl	0.0080	93.8	79.7	117.0	114.0	110.0	101.0	102.6	13.8	0.0160	70.3	107.0	101.0	111.0	107.0	102.0	99.7	14.9	0.0800	116.0	113.0	113.0	103.0	98.3	94.2	106.3	8.5
441	Indoxacarb	0.0200	85.5	128.0	109.0	92.0	78.4	71.2	94.0	22.4	0.0400	68.8	111.0	93.4	131.0	121.0	105.0	105.0	20.9	0.2000	110.0	94.6	108.0	108.0	112.0	105.0	106.3	5.8
442	Quizalofop-ethyl	0.0040	96.2	69.2	104.0	109.0	109.0	113.0	100.1	16.2	0.0080	67.6	98.4	103.0	124.0	120.0	120.0	105.5	20.1	0.0400	109.0	93.4	120.0	103.0	103.0	106.0	105.7	8.3
444	Furathiocarb	0.0040	77.1	101.0	113.0	82.4	92.9	90.9	92.9	13.9	0.0080	54.9	58.9	86.4	84.3	107.0	72.8	77.4	25.0	0.0400	85.8	89.7	97.5	104.0	133.0	111.0	103.5	16.5
445	Fluazifop-butyl	0.0080	99.3	85.2	111.0	111.0	95.6	89.5	98.6	10.9	0.0160	66.8	101.0	111.0	134.0	116.0	103.0	105.3	21.1	0.0800	96.0	110.0	107.0	103.0	100.0	88.7	100.8	7.7
446	Flufenoxuron	0.0800	143.0	205.0	130.0	113.0	54.2	106.0	123.0	13.6	0.1600	77.3	125.0	170.0	113.0	74.1	94.0	93.7	20.8	0.8000	134.0	102.0	137.0	96.6	84.5	85.3	106.6	22.0

(**h**) *Nitrogen evaporator*.—EVAP 112 (Organomation Associates, Inc., New Berlin, MA).

Extraction

Weigh 20 g test sample, accurate to 0.01 g, into an 80 mL centrifuge tube. Add 40 mL acetonitrile, and homogenize at 15 000 rpm for 1 min. Add 5 g NaCl to the centrifuge tube and homogenize at 15 000 rpm for 1 min again, then centrifuge at 3000 rpm for 5 min. Pipet the above acetonitrile layer of the extracts for cleanup.

Cleanup

For A–D group pesticides, fix the Envi-18 cartridge in a support. Condition the cartridge with 10 mL acetonitrile before adding the sample. Connect a pear-shaped flask to the cartridge. Deposit half of the extract into the SPE cartridge and elute with 15 mL acetonitrile. Evaporate the eluate to 1 mL using a rotary evaporator at 40°C. For E group pesticides, concentrate the other half of the above extracts to ca 1 mL using the rotary evaporator at 40°C.

Add sodium sulfate into the Envi-Carb cartridge to a height of ca 2 cm. Connect the cartridge to the top of the aminopropyl Sep-Pak cartridge in series. Fix the cartridges into a support to which a pear-shaped flask is connected as shown in Figure 1.

Condition the cartridges with 4 mL acetonitrile–toluene (3 + 1) before adding the sample. Once the solution gets to the top of sodium sulfate, pipet the eluate into the cartridges immediately. Rinse the pear-shaped flask with 3 × 2 mL acetonitrile–toluene (3 + 1), and decant it into the cartridges. Insert a reservoir into the cartridges. Elute the pesticides with 25 mL acetonitrile–toluene (3 + 1). Evaporate the eluate to ca 0.5 mL using a rotary evaporator at 40°C. For A–D group pesticides, exchange with 2 × 5 mL hexane twice and make up to ca 1 mL. Add 40 µL internal standard solution and mix thoroughly. The extract solution is equivalent to 10 g fruit or vegetable samples and is ready for GC/MS determination. For E group pesticides, evaporate the eluate to dryness using a nitrogen evaporator. Make up to 1 mL with acetonitrile–water (3 + 2). Mix thoroughly. The solution is ready for LC/MS/MS determination. The extract solution is equivalent to 10 g fruit or vegetable samples.

Determination

(**a**) *GC/MS qualitative determination*.—In the samples determined, 4 injections are required to analyze all pesticides according to GC/MS operating conditions. If the retention times in the peaks of sample solution are the same as for the peaks of the working standard mixed solution, the selected ions of the background-subtracted mass spectrum appear, and the abundance ratios of selected ions are within the expected limits, then the sample is confirmed to contain this pesticide compound. In the case where results are still not definitive, the sample should be reinjected with acquisition in the scan mode (sufficient sensitivity) or with additional confirmatory ions or by other instruments that have higher sensitivity.

(**b**) *GC/MS quantitative determination*.—The results are quantitated using heptachlor epoxide for an internal standard and the quantitation ion response for each analyte. In order to compensate for the matrix effect, quantitation is based on a mixed standard prepared in blank matrix extract. The concentrations of the standard solution and the detected sample solution must be similar. Figures 2–5 are chromatograms of apples fortified with each of the 4 pesticide standard mixtures (A–D), respectively.

(**c**) *LC/MS/MS qualitative determination*.—In the samples determined, if the retention times of the peaks found in the sample solution chromatogram are the same as the peaks in the standard in blank matrix extract chromatogram, and the abundance ratios of multiple reaction monitoring (MRM) transitions are within the expected limits, the sample is confirmed to contain this pesticide compound.

(**d**) *LC/MS/MS quantitative determination*.—The external standard method is used for quantitation with standard curves for LC/MS/MS. In order to compensate for the matrix effect, quantitation is based on a series of working standard solutions prepared in blank matrix extract. The standard curves are established by injection of different concentrations of working standard mixed solutions in matrix separately. The responses of pesticides in the sample solution should be in the linear range of the instrumental detection. LC/MS/MS chromatograms of standards in apple blank matrix extracts are shown in Figures 6 and 7.

Results and Discussion

Selection of Sample Extracting Condition

Review of multiresidue pesticide methods showed that extracting solvents with higher polarities, such as acetonitrile, acetone, ethyl acetate, etc., are commonly used for extraction of pesticide residues with large differences of polarity from agricultural products of fruits and vegetables. Fillion et al. (22) determined 251 pesticides with acetonitrile extraction, Obana et al. (14) analyzed 110 pesticides with ethyl acetate extraction, and Stan et al. (4) detected over 400 pesticides with acetone extraction. Therefore, a comparative experiment was conducted to determine the extraction efficiency of the these 3 solvents. Apple samples were fortified with all 446 pesticides and extracted with each solvent. Results indicated that all of the solvents were effective for the extraction of pesticides, but the acetonitrile extract was found to contain the least amount of product coextractants, such as plant pigments. Therefore, acetonitrile was selected as the extraction solvent.

Selection of Sample Cleanup Conditions

Liquid–liquid partitioning is the traditional method of cleanup, but it requires the pesticides determined to possess similar solubility features and results in relatively large consumption of the solvents. GPC is more applicable to the cleanup of lipids, waxes, and other low volatility, high molecular weight nonpolar coextractives. SPE is the cleanup method universally adopted for modern residue analysis and is used widely for residue analysis of nonfatty samples. Therefore, SPE was selected for cleanup of the acetonitrile extracts. Two SPE regimens were developed and compared: a 2-column procedure with Envi-carb + aminopropyl Sep-Pak cartridges, and a 3-column cleanup with C18 + Envi-carb + aminopropyl Sep-Pak cartridges. Results indicated the 3-column cleanup provided better removal of sample coextractives, especially plant pigments; however, some pesticides from standard mixture E for LC/MS/MS determination were lost, such as aminocarb, vamidothion, pirimicarb, imazalil, and spiroxamine. Therefore, the 3-column cleanup was used for pesticide Groups A–D and the 2-column cleanup used for pesticide Group E, with very good results.

Selection of GC/MS Conditions

For the purpose of obtaining accurate and reliable GC/MS analytical results, a scan test of each pesticide standard solution to be analyzed was conducted initially to obtain its scanning mass spectrum and retention time. One quantitative ion and 2 qualitative ions should be selected for each compound, and 3 qualitative ions should be chosen for the banned pesticides, such as HCH, DDT, nitrofen, aldrin, dieldrin, methyl-parathion, parathion, coumaphos, fenvalerate, etc. Based on the retention time of 383 pesticides, Groups A–D are formed, with about 100 pesticides included in each group. In order to ensure the sensitivity of each pesticide, all of the ions to be determined for each group should be monitored per time frame based on the peak sequence, which is what is called "Sequential Detection Based on Time Frame and Groups." Appropriate control is rendered to the number of ions within a certain time frame and dwell time, and attention should be paid to the incomplete peaking and the appearance of peaks in the first part of the time frame. The dwell time for each ion is adjustable so as to ensure that each passing chromatographic peak is of the cycling scan in the constant cycling scan time and that all of the monitored compounds possess sufficient data collection points. The change of dwell time will not affect the results of integration. Tests proved that detection procedures per group and time frame is scientifically reasonable and allows the determination of multiresidues to be as simple as single residue determination.

Selection of LC/MS/MS Conditions

Continuous infusion of each compound was carried out in positive and negative ionization modes with an ESI source. Full scan mass spectra were recorded in order to select the most abundant mass-to-charge-ratio (*m/z*). The relative intensity for the most abundant *m/z* was used to evaluate the performance of each ionization mode. The signal intensities obtained in the positive mode were high. Full scan daughter mass spectra were obtained with continuous infusion of each analyte in the product ion scan mode, keeping Q1 locked on the *m/z* value corresponding to the protonated molecule. The most abundant product ion for each compound was chosen for LC/MS/MS analysis in the MRM mode. The transition ions are listed in Table 2. For each analyte, the values of the voltages applied to the sampling cone, focusing lenses, collision cell, and quadrupoles were optimized in the MRM mode by continuous infusion in order to achieve the highest sensitivity possible. For LC/MS/MS analysis, optimization of the nebulizing gas, auxiliary gas, and curtain gas pressure further improved the sensitivity. Identification of the target analytes in unknown samples was based on LC retention time compared to that of a standard and the unique combination of a precursor product ion.

Linear Range, Limit of Detection (LOD), and Limit of Quantitation (LOQ)

Under the conditions of GC/MS and LC/MS/MS selected, determination of the linear range of 446 pesticides was conducted, with the results listed in Table 2. In the linear range of each pesticide, the linear correlation coefficient (r) equals or is greater than 0.956, among which r values over 0.990 account for 94% of the fortification concentration giving a signal-to-noise ratio (S/N) ≥5 for a pesticide is regarded as its LOD, and the fortification concentration giving an S/N ≥10 is the LOQ. LOD and LOQ values of 446 pesticides are tabulated in Table 2.

Recoveries and Precision

Fortification recovery experiments were conducted at high, medium, and low levels on 3 kinds of fruits (apples, grapes, and oranges) and 3 varieties of vegetables (cabbages, tomatoes, and celeries). Samples were fortified with pesticide mixes A–E and allowed to stand for 30 min so that all of the pesticides are absorbed thoroughly by samples before making the analysis. The results of the fortification recovery studies for all 446 pesticides from the 6 selected commodities at 3 fortification levels are shown in Table 4. Dixon inspection shows that there are 177 aberrant values in the 8020 recovery data, accounting for 2.2%, with average recoveries falling between 55.0–133.8%, of which 60–120% make up 99.0%. The relative standard deviation (RSD) is between 2.1–39.1%, of which 2.1–25.0% account for 96.0%. Therefore, it can be seen that the method has good accuracy and repeatability.

Applicability of the Method

For the purpose of confirming the applicability of the method for analysis of different fruits and vegetables, fortification recovery tests were conducted on more than 20 samples, such as apples, pears, tangerines, oranges, bananas, grapes, kiwi, cabbage, tomatoes, cucumbers, green peppers, leeks, onions, cauliflower, celery, string beans, carrots, potatoes, and lettuce. All the fortification recoveries were relatively good except for leeks and onions, which gave poor results due to the relatively high interferences. This demonstrates that the method has wide applicability for samples of fruits and vegetables.

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