

FY 2008 Survey Results of Water Pollution by Agricultural Chemicals Used at Golf Courses

November 16, 2009

The Ministry of the Environment has collected the results of a monitoring survey of agricultural chemicals in golf course drains conducted by local governments and regional environment offices in FY2008.

The monitoring survey was conducted according to the "Tentative Guideline for the Prevention of Water Pollution by Agricultural Chemicals Used in Golf Courses", hereinafter referred as "the Guidelines". 23,403 samples from 634 golf courses were examined in the survey, and no samples exceeding guideline targets were detected (Table 1 & 2).

The Ministry of the Environment notified all prefectures of the Guideline in 1990 in order to prevent water pollution caused by agricultural chemicals used in golf courses. The methods of measurement of agricultural chemicals used in the golf courses and the Guideline values of agricultural chemicals are described therein.

Local governments administer golf courses in accordance with the Guideline.

The Ministry of the Environment requires local governments to report on their monitoring surveys (regional environment offices began participating in the monitoring surveys in FY 2004).

The Ministry of the Environment will manage all concerned parties in close cooperation with local governments to prevent water pollution by agricultural chemicals.

Table 1 Summary of survey results of each prefecture

Prefectures	Number of golf courses surveyed		Number of agricultural chemicals surveyed		Total number of samples *		Number of samples **		Number of samples exceeding the guideline target	
Hokkaido	55	(2)***	45	(45)	677	(90)	120	(45)	0	(0)
Aomori	0		0		0		0		-	
Iwate	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Miyagi	3	(1)	45	(45)	135	(45)	0	(0)	-	(-)
Akita	2		6		6		0		-	
Yamagata	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Fukushima	17		45		675		126		0	
Ibaraki	4		10		30		14		0	
Tochigi	74		45		2,545		1,236		0	
Gumma	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Saitama	36		45		1,154		776		0	
Chiba	23		45		853		264		0	
Tokyo	3	(1)	45	(45)	59	(45)	52	(45)	0	(0)
Kanagawa	13		26		165		150		0	
Niigata	3		12		51		33		0	
Yamanashi	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Shizuoka	19		24		456		312		0	
Toyama	16		44		689		689		0	
Ishikawa	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Fukui	5		45		186		6		0	
Nagano	9		45		466		294		0	
Gifu	4	(1)	45	(45)	61	(45)	0	(0)	-	(-)
Aichi	44		45		413		172		0	
Mie	6	(1)	45	(45)	70	(45)	25	(0)	0	(-)
Shiga	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Kyoto	14		33		246		212		0	
Osaka	25		28		460		50		0	
Hyogo	87		45		4,971		526		0	
Nara	35		41		1,810		770		0	
Wakayama	2	(2)	45	(45)	90	(90)	45	(45)	0	(0)
Tottori	1	(1)	45	(45)	90	(90)	45	(45)	0	(0)
Shimane	5		20		72		18		0	
Okayama	28		45		1,611		480		0	
Hiroshima	9		43		465		422		0	
Yamaguchi	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Tokushima	1	(1)	45	(45)	45	(45)	0	(0)	-	(-)
Kagawa	22		38		836		836		0	
Ehime	0		0		0		0		-	
Kochi	1	(1)	45	(45)	45	(45)	45	(45)	0	(0)
Fukuoka	19		45		957		451		0	
Saga	5		25		60		39		0	
Nagasaki	10		42		1,438		252		0	
Kumamoto	9		27		459		162		0	
Oita	4	(1)	45	(45)	207	(45)	45	(45)	0	(0)
Miyazaki	1	(1)	45	(45)	45	(45)	45	(45)	0	(0)
Kagoshima	11		45		400		51		0	
Okinawa	2	(1)	45	(45)	90	(45)	0	(0)	-	(-)
	634	(21)	-		23,403	(990)	8,763	(315)	0	(0)

Notes: * Total number of samples includes those collected from drain, pond in golf courses, and water outside of golf courses.

Notes: ** Table above shows the data collected at drain outlets of golf courses.

Notes: *** Figures in parenthesis are results by regional environment offices

Table 2 Summary of survey results of each chemical

Agricultural chemicals	Guideline target (mg/ l)	Concentration range detected * (mg/ l)	Number of samples exceeding the guideline target	Number of samples *
(Insecticides)				
Accephate	0.8	n.d. to 0.001	0	167
Isoxathion	0.08	n.d.	0	204
Isofenphos	0.01	n.d.	0	143
Ethofenprox	0.8	n.d.	0	142
Chlorpyrihos	0.04	n.d.	0	186
Diazinon	0.05	n.d. to 0.001	0	247
Thiodicarb	0.8	n.d. to 0.001	0	183
Trichlorfon(DEP)	0.3	n.d.	0	127
Pyridaphenthion	0.02	n.d.	0	167
Fenitrothion (MEP)	0.03	n.d. to 0.009	0	260
(Fungicides)				
Azoxystrobin	5	n.d. to 0.013	0	256
Isoprothiolane	0.4	n.d. to 0.0019	0	204
Iprodione	3	n.d. to 0.002	0	215
Iminoctadine-triacetate	0.06	n.d.	0	134
Etridiazol	0.04	n.d.	0	142
Oxine-copper	0.4	n.d. to 0.001	0	192
Captan	3	n.d.	0	157
Chlorotalonil (TPN)	0.4	n.d. to 0.0001	0	230
Chloroneb	0.5	n.d.	0	196
Thiram	0.06	n.d. to 0.002	0	213
Tolclofos-methyl	0.8	n.d. to 0.012	0	227
Flutoranil	2	n.d. to 0.0045	0	226
Propiconazole	0.5	n.d. to 0.019	0	233
Pencycuron	0.4	n.d. to 0.011	0	253
Phosethyl	23	n.d.	0	149
Polycarbamate	0.3	n.d. to 0.002	0	134
Metalaxyl	0.5	n.d. to 0.0004	0	239
Mepronil	1	n.d. to 0.002	0	215
(Herbicides)				
Asulam	2	n.d. to 0.022	0	274
Dithiopyr	0.08	n.d. to 0.0001	0	195
Siduron	3	n.d. to 0.0001	0	198
Simazine	0.03	n.d. to 0.006	0	192
Terbucarb (MBPMC)	0.2	n.d. to 0.0002	0	170
Triclopyr	0.06	n.d. to 0.002	0	205
Napropamide	0.3	n.d. to 0.001	0	181
Halosulfuron-methyl	0.3	n.d. to 0.002	0	210
Pyributicarb	0.2	n.d.	0	179
Butamifos	0.04	n.d. to 0.0009	0	172
Flazasulfuron	0.3	n.d.	0	196
Propyzamide	0.08	n.d. to 0.041	0	206
Bensulide (SAP)	1	n.d.	0	149
Pendimethalin	0.5	n.d. to 0.0001	0	219
Benfluralin	0.8	n.d.	0	193
Mecoprop (MCP)	0.05	n.d. to 0.002	0	218
Methyldymron	0.3	n.d.	0	165
Total		—	0	8,763

Notes: * Table above shows the data collected at drain outlets of golf courses.