

## **FY 2007 Survey Results of Water Pollution by Agricultural Chemicals Used at Golf Courses**

October 16, 2008

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 FY2007.

The monitoring survey was conducted according to the "Tentative Guidelines for the Prevention of Water Pollution by Agricultural Chemicals Used in Golf Courses", hereinafter referred as "the guidelines". 27,365 samples from 754 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 guidelines 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 guidelines.

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)	479 (90)	75 (0)	0 (-)
Aomori	0	0	0	0	-
Iwate	1 (1)	45 (45)	45 (45)	45 (45)	0 (0)
Miyagi	5 (1)	45 (45)	157 (45)	45 (45)	0 (0)
Akita	5	9	14	0	0
Yamagata	1 (1)	45 (45)	45 (45)	45 (45)	0 (0)
Fukushima	17	45	666	90	0
Ibaraki	4	16	33	0	-
Tochigi	73	45	2,464	1,285	0
Gumma	1 (1)	45 (45)	45 (45)	0 (0)	- (-)
Saitama	35	45	1,109	753	0
Chiba	22	45	818	224	0
Tokyo	1 (1)	45 (45)	45 (45)	45 (45)	0 (0)
Kanagawa	14	43	322	290	0
Niigata	4 (1)	45 (45)	97 (45)	32 (0)	0 (-)
Yamanashi	0	0	0	0	-
Shizuoka	18	24	432	240	0
Toyama	16	45	666	666	0
Ishikawa	1 (1)	45 (45)	45 (45)	45 (45)	0 (0)
Fukui	5	45	186	6	0
Nagano	10	45	433	293	0
Gifu	4 (1)	45 (45)	61 (45)	45 (45)	0 (0)
Aichi	44	45	406	176	0
Mie	1 (1)	45 (45)	45 (45)	45 (45)	0 (0)
Shiga	16 (1)	45 (45)	195 (45)	150 (0)	0 (-)
Kyoto	19	30	238	210	0
Osaka	38	45	1,056	369	0
Hyogo	113	45	7,551	346	0
Nara	35	41	1,810	770	0
Wakayama	2 (2)	45 (45)	90 (90)	0 (0)	- (-)
Tottori	1 (1)	45 (45)	45 (45)	45 (45)	0 (0)
Shimane	5	20	66	0	-
Okayama	35	45	1,550	520	0
Hiroshima	9 (1)	45 (45)	381 (45)	336 (0)	0 (-)
Yamaguchi	39	17	212	212	0
Tokushima	1 (1)	45 (45)	45 (45)	0 (0)	- (-)
Kagawa	22	38	836	836	0
Ehime	14	38	532	532	0
Kochi	1 (1)	45 (45)	45 (45)	0 (0)	- (-)
Fukuoka	19	45	1,120	496	0
Saga	7 (1)	45 (45)	104 (45)	55 (45)	0 (0)
Nagasaki	9	42	1,438	252	0
Kumamoto	16	27	837	27	0
Oita	3 (1)	45 (45)	162 (45)	0 (0)	- (-)
Miyazaki	1 (1)	45 (45)	45 (45)	0 (0)	- (-)
Kagoshima	11	44	349	41	0
Okinawa	1	45	45	0	-
	754 (21)	- -	27,365 (945)	9,642 (405)	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 *
<b>(Insecticides)</b>				
Acephate	0.8	ND to 0.001	0	178
Isoxathion	0.08	ND	0	232
Isofenphos	0.01	ND	0	158
Ethofenprox	0.8	ND	0	162
Chlorpyrihos	0.04	ND	0	184
Diazinon	0.05	ND to 0.001	0	299
Thiodicarb	0.8	ND to 0.0005	0	164
Trichlorfon(DEP)	0.3	ND	0	149
Pyridaphenthion	0.02	ND	0	206
Fenitrothion (MEP)	0.03	ND to 0.028	0	307
<b>(Fungicides)</b>				
Azoxystrobin	5	ND to 0.002	0	264
Isoprothiolane	0.4	ND	0	234
Iprodione	3	ND to 0.017	0	244
Iminoctadine-triacetate	0.06	ND	0	126
Etridiazol	0.04	ND	0	158
Oxine-copper	0.4	ND	0	195
Captan	3	ND	0	159
Chlorotalonil (TPN)	0.4	ND	0	218
Chloroneb	0.5	ND	0	229
Thiram	0.06	ND	0	210
Tolclofos-methyl	0.8	ND to 0.11	0	249
Flutoranil	2	ND to 0.008	0	254
Propiconazole	0.5	ND to 0.004	0	251
Pencycuron	0.4	ND to 0.003	0	308
Phosethyl	23	ND to 0.014	0	147
Polycarbamate	0.3	ND to 0.001	0	170
Metalaxyl	0.5	ND to 0.003	0	258
Mepronil	1	ND to 0.005	0	248
<b>(Herbicides)</b>				
Asulam	2	ND to 0.19	0	286
Dithiopyr	0.08	ND	0	209
Siduron	3	ND to 0.002	0	223
Simazine	0.03	ND to 0.017	0	211
Terbucarb (MBPMC)	0.2	ND to 0.004	0	195
Triclopyr	0.06	ND to 0.008	0	225
Napropamide	0.3	ND	0	196
Halosulfuron-methyl	0.3	ND to 0.005	0	266
Pyributicarb	0.2	ND to 0.0003	0	209
Butamifos	0.04	ND	0	209
Flazasulfuron	0.3	ND	0	184
Propyzamide	0.08	ND to 0.022	0	225
Bensulide (SAP)	1	ND	0	162
Pendimethalin	0.5	ND to 0.0008	0	249
Benfluralin	0.8	ND	0	213
Mecoprop (MCP)	0.05	ND to 0.011	0	225
Methyldymron	0.3	ND	0	194
<b>Total</b>		—	<b>0</b>	<b>9,642</b>

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