

FY 2021 Survey Results of Agricultural Chemicals in Drainage Waters of Golf Courses
September 30, 2022

The Ministry of the Environment has collected the results of monitoring surveys of agricultural chemicals in drainage waters of golf courses, conducted by local government in FY 2021.

The monitoring surveys were conducted in accordance with the “Guideline for the Prevention of Water Pollution, and Damage to Aquatic Animals and Plants by Agricultural Chemicals Used in Golf Courses”, hereinafter referred to as “the Guideline”. A total of 36,315 samples from 1,605 golf courses were measured in the surveys, and 16 samples of the drains exceeded reference values of concentrations set in the Guideline (Table 1 and Table 2). The reference values are as of February 16, 2022.

Table 1 Summary of survey results*

Prefecture		Number of golf courses surveyed	Number of agricultural chemicals surveyed	Total number of samples ^{**}	The number of samples surveyed from drains	Number of samples exceeding the reference value		Number of samples the detection limit exceeded the reference value	
						Water Pollution	Aquatic Animals and Plants	Water Pollution	Aquatic Animals and Plants
1	Hokkaido	118	69	1,053	448	0	1	0	0
2	Aomori	15	55	67	27	0	1	0	0
3	Iwate	23	73	207	46	0	3	0	0
4	Miyagi	30	48	328	108	0	0	0	0
5	Akita	16	37	104	24	0	0	0	0
6	Yamagata	5	27	104	3	0	0	0	0
7	Fukushima	23	103	107	46	0	0	0	0
8	Ibaraki	112	121	3,138	1,015	0	1	0	0
9	Tochigi	102	99	943	305	0	0	0	0
10	Gunma	61	91	934	42	0	0	0	0
11	Saitama	80	120	2,213	563	0	0	0	4
12	Chiba	54	122	1,315	589	0	0	0	13
13	Tokyo	20	73	463	303	0	0	0	8
14	Kanagawa	49	91	1,065	385	0	1	0	9
15	Yamanashi	37	81	463	120	0	0	0	0
16	Nagano	63	131	2,318	167	0	0	0	0
17	Niigata	41	58	882	364	0	0	0	29
18	Toyama	15	58	375	375	0	1	0	0
19	Ishikawa	24	53	238	76	0	0	0	0
20	Fukui	13	45	147	43	0	0	0	0
21	Gifu	38	109	380	83	0	0	1	0
22	Shizuoka	13	80	339	269	0	0	0	0
23	Aichi	21	102	289	103	0	0	0	3
24	Mie	33	56	182	67	0	0	0	0
25	Shiga	44	57	638	518	0	0	0	0
26	Kyoto	31	104	1,264	752	0	4	0	0
27	Osaka	39	104	889	153	0	4	0	0
28	Hyogo	136	162	7,694	583	0	0	0	0
29	Nara	34	95	1,404	29	0	0	0	0
30	Wakayama	3	35	175	0	-	-	-	-
31	Tottori	3	10	16	0	-	-	-	-
32	Shimane	8	30	190	0	-	-	-	-
33	Okayama	44	90	1,651	383	0	0	0	0
34	Hiroshima	8	114	849	779	0	0	0	0
35	Yamaguchi	20	57	125	104	0	0	0	0
36	Tokushima	11	20	118	40	0	0	0	0
37	Kagawa	19	38	240	7	0	0	0	0
38	Ehime	26	51	51	0	-	-	-	-
39	Kochi	9	26	134	0	-	-	-	-
40	Fukuoka	9	68	167	115	0	0	0	0
41	Saga	14	71	587	230	0	0	0	0
42	Nagasaki	16	51	256	14	0	0	0	0
43	Kumamoto	39	96	1,146	56	0	0	0	19
44	Oita	26	56	409	22	0	0	0	0
45	Miyazaki	25	66	241	24	0	0	0	0
46	Kagoshima	26	148	287	186	0	0	0	0
47	Okinawa	9	37	130	7	0	0	0	0
total		1,605		36,315	9,573	0	16	1	85

Notes* The total number of samples includes those surveyed by municipalities and golf courses reported to their prefectures.

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

Table 2 Summary of survey results of each chemical in golf course drains

Agricultural chemicals	Number of courses surveyed	Total number of samples	The number of samples surveyed from drains	Concentration range detected (µg/L)*	detection limits	Number of Detection	Reference Values		Number of samples exceeding the reference value		Number of samples the detection limit exceeded the reference value			
							Water Pollution	Aquatic Animals and Plants	Water Pollution	Aquatic Animals and Plants	Water Pollution	Aquatic Animals and Plants		
A	1	Asulam-sodium or Asulam	760	2,297	577	N.D. - 10,000	0.001 - 1,000	160	10,000	90,000				
	2	Chlorothalonil or TPN	361	942	221	N.D. - 1	0.1 - 40	3	470	80				
	3	Cyclosulfamuron	220	467	167	N.D. - 5	0.001 - 8	7	800	35				
	4	Pencycuron	521	1,250	314	N.D. - 5	0.5 - 1,000	45	1,400	1,000				
	5	Diazinon	215	436	92	N.D. - 3	0.05 - 5	4	20	0.77			1	22
	6	Pyroxasulfone	242	591	156	N.D. - 49	0.1 - 6	83	500	7.4			11	
B	7	Oxine-Copper				33	1		200	18			1	
	8	Cafenstrole				27	1		70	20			1	
	9	Clothianidin				34	1		2,500	28			1	
	10	Fenoxasulfone				15	0.9		4,500	9.3			1	

A : Agricultural chemicals that require attentional control considering their usage amounts in golf courses or recent numbers exceeded their reference values

B : Agricultural chemicals that exceeded their reference values in the survey (only exceeded samples, not all the results)

Notes* "N.D." : not detected.