FY 2024 Survey Results of Agricultural Chemicals in Drainage Waters from Golf Courses

October 6, 2025

The Ministry of the Environment has collected the results of monitoring surveys of agricultural chemicals in drainage waters from golf courses, conducted by local governments in FY 2024.

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”. A total of 35,012 samples from 2,095 golf courses were measured in the surveys, and 9 samples of the drains exceeded reference concentration values specified in the Guideline (see Table 1 and Table 2). The reference concentration values cited are as of November 27, 2024.

Based on the survey results, the prefectural governments will be requested to investigate the causes of the exceedances and to issue warnings to golf-courses operators aimed at preventing recurrence.

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 values***		Number of samples the lower limit of quantification exceeded the reference values***, ****	
						Water Pollution	Aquatic Animals and Plants	Water Pollution	Aquatic Animals and Plants
1	Hokkaido	120	70	1,057	419	0	0	0	0
2	Aomori	13	46	39	23	0	0	0	0
3	Iwate	47	65	187	30	0	0	0	1
4	Miyagi	41	95	368	159	0	0	0	1
5	Akita	15	27	101	14	0	0	0	0
6	Yamagata	3	20	91	20	0	0	0	0
7	Fukushima	50	99	862	286	0	1	0	0
8	Ibaraki	114	114	2,832	1,702	0	3	0	8
9	Tochigi	108	110	1,844	462	0	0	0	10
10	Gunma	60	96	946	25	0	0	0	0
11	Saitama	316	130	2,174	602	0	0	0	0
12	Chiba	64	122	744	324	0	0	0	3
13	Tokyo	38	73	500	356	0	0	0	0
14	Kanagawa	52	78	1,110	418	0	1	0	1
15	Yamanashi	40	83	495	117	0	0	0	0
16	Nagano	59	131	2,195	360	0	0	0	0
17	Niigata	31	49	580	257	0	0	0	29
18	Toyama	32	38	260	260	0	0	0	0
19	Ishikawa	45	55	238	94	0	0	0	0
20	Fukui	25	42	106	22	0	0	0	0
21	Gifu	38	95	363	75	1	0	0	0
22	Shizuoka	6	127	111	53	0	0	0	0
23	Aichi	20	78	160	44	0	0	0	0
24	Mie	37	47	402	69	0	0	0	0
25	Shiga	85	46	527	96	0	0	0	0
26	Kyoto	31	100	971	558	0	0	0	0
27	Osaka	36	108	865	292	0	0	0	0
28	Hyogo	117	156	5,765	681	0	0	0	0
29	Nara	26	83	1,208	15	0	0	0	0
30	Wakayama	3	35	175	0	-	-	-	-
31	Tottori	3	10	15	0	-	-	-	-
32	Shimane	5	21	118	0	-	-	-	-
33	Okayama	33	80	1,310	174	0	0	0	0
34	Hiroshima	8	111	865	785	1	2	0	0
35	Yamaguchi	15	54	167	138	0	0	0	0
36	Tokushima	20	21	115	26	0	0	0	0
37	Kagawa	36	38	246	6	0	0	0	0
38	Ehime	25	30	52	2	0	0	0	0
39	Kochi	9	28	118	0	-	-	-	-
40	Fukuoka	58	133	1,712	642	0	0	0	7
41	Saga	16	68	574	284	0	0	0	0
42	Nagasaki	33	83	275	96	0	0	0	0
43	Kumamoto	64	86	966	58	0	0	0	10
44	Oita	23	61	410	26	0	0	0	0
45	Miyazaki	26	61	302	29	0	0	0	0
46	Kagoshima	42	92	417	211	0	0	0	9
47	Okinawa	7	27	74	0	-	-	-	-
total		2,095		35,012	10,310	2	7	0	79

Notes* The total number of samples includes those surveyed by municipalities and golf courses, which were reported to the relevant prefectures.
Notes** The total number of samples includes those collected from drain, pond in golf courses, and water outside of golf courses.
Notes*** "-" means no sample were collected from drainage.
Notes**** The number of samples whether to exceed the reference values remains uncertain because the lower limit of quantification exceeded the values.

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 (μg/L)	Number of Detection	Reference Values (μg/L)		Number of samples exceeding the reference values		Number of samples the lower limit of quantification exceeded the reference values***	
									Water Pollution	Aquatic Animals and Plants	Water Pollution	Aquatic Animals and Plants	Water Pollution	Aquatic Animals and Plants
A ****	1	Asulam-sodium or Asulam	764	2,087	649	N.D. - 1,000	0.001 - 1,000	195	10,000	90,000	0	0	0	0
	2	Chlorothalonil or TPN	394	910	296	N.D. - 270	0.001 - 47	3	470	80	0	1	0	0
	3	Cyclosulfamuron	223	478	178	N.D. - 4	0.0035 - 80	5	800	35	0	0	0	11
	4	Pencycuron	587	1,338	418	N.D. - 100	0.001 - 1,000	40	1,400	1,000	0	0	0	0
	5	Diazinon	194	371	92	N.D.	0.0077 - 5	0	20	0.77	0	0	0	19
	6	Pyroxasulfone	251	505	152	N.D. - 22	0.0005 - 140	67	500	7.4	0	4	0	2
Others *****		clothianidin	-	-	-	82	1	-	2,500	28	0	1	-	-
		thiuram (thiram)	-	-	-	4,700	0.2	-	200	100	1	1	-	-
		triclopyr	-	-	-	360	6	-	60	600	1	0	-	-

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

Notes** "N.D." means non-detection or below the detection limit.

Notes*** The number of samples whether to exceed the reference values remains uncertain because the lower limit of quantification exceeded the values.

Notes**** These agricultural chemicals require attentional control considering their large amount of usage in golf courses or their relatively large number of samples exceeded the reference values in the past.

Notes***** Other than "A"-group agricultural chemicals exeeded the reference values (only exceeded samples, not all the results).