Estimated Annual Agricultural Pesticide Use
Yakima County 2012-2016

13 July 2018

Summary

Table 1 lists the rank and best available estimates of mass applied (kg) for the 80 most common agricultural pesticides in Yakima County during 2016, as reported by USGS Estimated Annual Agricultural Pesticide Use data. The table also includes rank by 3-year average (2014-2016) and 5-year average (2012-2016) estimates of mass applied. Rankings and estimates are based on the *EPest-high method* described by Theilen and Stone (2013) and Baker and Stone (2015):

> "EPest-low and EPest-high, are used to estimate a range of pesticide use. Both EPest-low and EPest-high methods incorporate proprietary surveyed rates for Crop Reporting Districts (CRDs), but EPest-low and EPest-high estimates differ in how they treat situations when a CRD was surveyed and pesticide use was not reported for a particular crop present in the CRD. In these situations, EPest-low assumes zero use in the CRD for that pesticide-by-crop combination. EPest-high, however, treats the unreported use for that pesticide-by- crop combination in the CRD as missing data. In this case, pesticide-by-crop use rates from neighboring CRDs or CRDs within the same region are used to estimate the pesticide-by-crop EPest-high rate for the CRD." *-Pesticide National Synthesis Project webpage*

USGS lists several caveats of these data, in particular:

- Data for 2013-2016 are preliminary estimates (i.e. "using projected county crop acres from the previous Census of Agriculture and are expected to be revised upon availability of updated crop acreages in the following Census of Agriculture")
- Reliability decreases with scale (e.g. "detailed interpretation of where and how much use occurs within a county is not appropriate")
- EPest-low estimates are more likely to reflect state-based restrictions on pesticide use than EPest-high estimates

For a more detailed look at the range (EPest-low and EPest-high) of 1-yr, 3-yr, and 5-yr data, please see Tables 2, 3, and 4, respectively.

Table 1: Top 80 EPest-high Estimates for Yakima County, 1-Yr (2016), 3-Yr Avg (2014-2016), 5-Yr Avg (2012-2016)

COMPOUND	RANK_1YR	RANK_3YR	RANK_5YR	EPEST_HIGH_KG_1YR_ONLY	EPEST_HIGH_KG_3YR_AVG	EPEST_HIGH_KG_5YR_AVG
PETROLEUM OIL	1	1	1	1476008	1364549	1326384
SULFUR	2	2	2	353460	315561	268728
CALCIUM POLYSULFIDE	3	3	3	169592	179006	151070
KAOLIN CLAY	4	4	4	136946	116728	123846
GLYPHOSATE	5	6	6	83303	60789	53866
METAM	6	7	7	52825	53838	53848
COPPER	7	10	11	44720	34259	25682
DICHLOROPROPENE	8	8	8	35376	51171	50571
CHLORPYRIFOS	9	9	9	34666	39098	37227
COPPER SULFATE	10	17	17	30139	16981	14036
SULFURIC ACID	11	13	12	25645	20285	21698
PARAQUAT	12	18	15	22925	15196	15512
2,4-D	13	14	14	17251	20070	20239
METAM POTASSIUM	14	12	10	15690	20368	33093
PENDIMETHALIN	15	20	16	12319	14077	15320
CARBARYL	16	11	13	12162	22275	20365
ZIRAM	17	21	25	10264	10734	9131
MANCOZEB	18	19	19	9773	14254	13200
TRIFLUMIZOLE	19	23	28	6143	7770	7368
POTASSIUM BICARBONATE	20	25	30	5651	7008	6368
ATRAZINE	21	44	39	5328	2919	3613
GLUFOSINATE	22	34	26	5132	4038	8302
TRICLOPYR	23	42	18	5062	3040	13701
BUPROFEZIN	24	43	54	4620	2928	2290
BOSCALID	25	33	38	3985	4168	3909
BACILLUS THURINGIENSIS	26	48	52	3707	2664	2347
MALATHION	27	50	53	3418	2540	2308
PHOSMET	28	27	32	3354	5704	5485
COPPER HYDROXIDE	29	39	29	3207	3164	6599
METRIBUZIN	30	49	57	3139	2563	1971
DIURON	31	29	36	2869	4796	4276
IMIDACLOPRID	32	38	43	2798	3357	2834
CHLORANTRANILIPROLE	33	46	50	2755	2726	2462
ORYZALIN	34	26	22	2575	6328	10256
THIOPHANATE-METHYL	35	36	44	2554	3608	2834
ETHEPHON	36	37	46	2318	3375	2568
TRIFLOXYSTROBIN	37	54	59	2206	2162	1819
PYRACLOSTROBIN	38	52	49	2169	2216	2504
SPINETORAM	39	47	45	2117	2726	2610
SPINOSYN	40	56	66	2037	1716	1426
CYPRODINIL	41	64	78	2027	1317	936
FLUMIOXAZIN	42	87	108	2004	702	456
PENTHIOPYRAD	43	40	51	1876	3092	2404
OXYFLUORFEN	44	55	41	1798	2128	3000
ACETAMIPRID	45	53	58	1794	2163	1920
SPIROTETRAMAT	46	67	68	1788	1277	1314
FLUOPYRAM	47	71	84	1779	1185	820
CHLOROPICRIN	48	41	34	1642	3066	5047
SETHOXYDIM	49	91	105	1640	606	494
PROHEXADIONE	50	68	72	1596	1242	1198
DIMETHOATE	51	73	71	1584	1126	1234
CUPROUS OXIDE	52	31	24	1546	4341	9441
MYCLOBUTANIL	53	66	74	1483	1278	1179
METHOXYFENOZIDE	54	63	67	1482	1325	1401
DCPA	55	78	92	1462	891	701
OXYTETRACYCLINE	56	60	64	1294	1452	1466
DICAMBA	57	82	81	1260	757	852
BROMOXYNIL	58	35	47	1207	3647	2519
AUREOBASIDIUM PULLULANS	59	85	91	1194	710	710
FENPROPATHRIN	60	69	86	1192	1225	782
BACILLUS SUBTILIS	61	86	77	1165	707	1080
NOVALURON	62	80	87	990	854	742
INDAZIFLAM	63	81	95	986	842	631
MCPA	64	75	85	972	996	792
2,4-DB	65	98	101	958	534	534
RIMSULFURON	66	76	94	924	920	635
BACILLUS AMYLOLIQUIFACIEN	67	28	35	900	4863	4863
DIMETHENAMID-P	68	70	80	809	1186	885
QUINOXYFEN	69	83	93	790	757	669
TRI-ALLATE	70	108	109	790	375	436
NORFLURAZON	71	61	63	770	1444	1654
METHOMYL	72	97	102	740	540	524
CHLOROTHALONIL	73	59	65	737	1539	1465
DIFENOCONAZOLE	74	99	116	717	474	344
TEBUCONAZOLE	75	92	110	711	602	398
HEXYTHIAZOX	76	89	104	703	661	500
BIFENAZATE	77	74	76	693	1046	1139
SIMAZINE	78	30	37	667	4447	4237
HEXAZINONE	79	62	75	663	1328	1172
FLUTRIAFOL	80	90	99	655	653	543

Appendices

Table 2: Top 50 Estimates in Yakima County, Range (EPest-low and EPest-high), 1-Yr, 2016

RANK_1YR	COMPOUND	EPEST_LOW_KG_1YR_ONLY	EPEST_HIGH_KG_1YR_ONLY
1	PETROLEUM OIL	1476008	1476008
2	SULFUR	353217	353460
3	CALCIUM POLYSULFIDE	169592	169592
4	KAOLIN CLAY	135786	136946
5	GLYPHOSATE	83010	83303
6	METAM	52713	52825
7	COPPER	44720	44720
8	DICHLOROPROPENE	35376	35376
9	CHLORPYRIFOS	34627	34666
10	COPPER SULFATE	30139	30139
11	SULFURIC ACID	NA	25645
12	PARAQUAT	22817	22925
13	2,4-D	16680	17251
14	METAM POTASSIUM	NA	15690
15	PENDIMETHALIN	11312	12319
16	CARBARYL	12053	12162
17	ZIRAM	10264	10264
18	MANCOZEB	9773	9773
19	TRIFLUMIZOLE	6143	6143
20	POTASSIUM BICARBONATE	5651	5651
21	ATRAZINE	48	5328
22	GLUFOSINATE	666	5132
23	TRICLOPYR	2	5062
24	BUPROFEZIN	4620	4620
25	BOSCALID	3985	3985
26	BACILLUS THURINGIENSIS	3707	3707
27	MALATHION	3350	3418
28	PHOSMET	3354	3354
29	COPPER HYDROXIDE	3052	3207
30	METRIBUZIN	3128	3139
31	DIURON	657	2869
32	IMIDACLOPRID	2785	2798
33	CHLORANTRANILIPROLE	2743	2755
34	ORYZALIN	2575	2575
35	THIOPHANATE-METHYL	2426	2554
36	ETHEPHON	2318	2318
37	TRIFLOXYSTROBIN	2206	2206
38	PYRACLOSTROBIN	1978	2169
39	SPINETORAM	2117	2117
40	SPINOSYN	2034	2037
41	CYPRODINIL	2027	2027
42	FLUMIOXAZIN	2000	2004
43	PENTHIOPYRAD	1818	1876
44	OXYFLUORFEN	1668	1798
45	ACETAMIPRID	1794	1794
46	SPIROTETRAMAT	1756	1788
47	FLUOPYRAM	1779	1779
48	CHLOROPICRIN	1373	1642
49	SETHOXYDIM	1640	1640
50	PROHEXADIONE	1596	1596

Table 3: Top 50 Estimates in Yakima County, Range (EPest-low and EPest-high), 3-Yr Avg, 2014-2016

RANK_3YR	COMPOUND	EPEST_LOW_KG_3YR_AVG	EPEST_HIGH_KG_3YR_AVG
1	PETROLEUM OIL	1364549	1364549
2	SULFUR	313320	315561
3	CALCIUM POLYSULFIDE	178768	179006
4	KAOLIN CLAY	115438	116728
5	CAPTAN	140	95668
6	GLYPHOSATE	59674	60789
7	METAM	36149	53838
8	DICHLOROPROPENE	49906	51171
9	CHLORPYRIFOS	38625	39098
10	COPPER	34250	34259
11	CARBARYL	22053	22275
12	METAM POTASSIUM	NA	20368
13	SULFURIC ACID	NA	20285
14	2,4-D	13942	20070
15	DODINE	NA	18024
16	PINOLENE	NA	17850
17	COPPER SULFATE	15851	16981
18	PARAQUAT	14129	15196
19	MANCOZEB	13232	14254
20	PENDIMETHALIN	12914	14077
21	ZIRAM	10734	10734
22	ACEPHATE	NA	8034
23	TRIFLUMIZOLE	7770	7770
24	METOLACHLOR-S	169	7517
25	POTASSIUM BICARBONATE	6798	7008
26	ORYZALIN	5326	6328
27	PHOSMET	5704	5704
28	BACILLUS AMYLOLIQUIFACIEN	NA	4863
29	DIURON	2268	4796
30	SIMAZINE	4447	4447
31	CUPROUS OXIDE	4080	4341
32	HYDROGEN PEROXIDE	614	4330
33	BOSCALID	4135	4168
34	GLUFOSINATE	NA	4038
35	BROMOXYNIL	945	3647
36	THIOPHANATE-METHYL	1781	3608
37	ETHEPHON	3375	3375
38	IMIDACLOPRID	3292	3357
39	COPPER HYDROXIDE	3070	3164
40	PENTHIOPYRAD	3061	3092
41	CHLOROPICRIN	2365	3066
42	TRICLOPYR	NA	3040
43	BUPROFEZIN	2928	2928
44	ATRAZINE	47	2919
45	DIAZINON	2739	2847
46	CHLORANTRANILIPROLE	2702	2726
47	SPINETORAM	2712	2726
48	BACILLUS THURINGIENSIS	2664	2664
49	METRIBUZIN	1289	2563
50	MALATHION	2471	2540

Table 4: Top 50 Estimates in Yakima County, Range (EPest-low and EPest-high), 5-Yr Avg, 2012-2016

RANK_5YR	COMPOUND	EPEST_LOW_KG_5YR_AVG	EPEST_HIGH_KG_5YR_AVG
1	PETROLEUM OIL	1326384	1326384
2	SULFUR	267165	268728
3	CALCIUM POLYSULFIDE	149848	151070
4	KAOLIN CLAY	122484	123846
5	CAPTAN	278	57501
6	GLYPHOSATE	52829	53866
7	METAM	39803	53848
8	DICHLOROPROPENE	47845	50571
9	CHLORPYRIFOS	36771	37227
10	METAM POTASSIUM	NA	33093
11	COPPER	25675	25682
12	SULFURIC ACID	NA	21698
13	CARBARYL	20232	20365
14	2,4-D	12427	20239
15	PARAQUAT	14232	15512
16	PENDIMETHALIN	14072	15320
17	COPPER SULFATE	12588	14036
18	TRICLOPYR	NA	13701
19	MANCOZEB	12405	13200
20	THIRAM	NA	12539
21	DODINE	NA	11883
22	ORYZALIN	9629	10256
23	PINOLENE	NA	9502
24	CUPROUS OXIDE	2723	9441
25	ZIRAM	9041	9131
26	GLUFOSINATE	NA	8302
27	ACEPHATE	NA	8034
28	TRIFLUMIZOLE	7368	7368
29	COPPER HYDROXIDE	6259	6599
30	POTASSIUM BICARBONATE	6242	6368
31	ENDOSULFAN	1502	6266
32	PHOSMET	5485	5485
33	METOLACHLOR-S	NA	5299
34	CHLOROPICRIN	3693	5047
35	BACILLUS AMYLOLIQUIFACIEN	NA	4863
36	DIURON	2261	4276
37	SIMAZINE	4217	4237
38	BOSCALID	3857	3909
39	ATRAZINE	1890	3613
40	AZINPHOS-METHYL	3551	3551
41	OXYFLUORFEN	2740	3000
42	HYDROGEN PEROXIDE	484	2894
43	IMIDACLOPRID	2787	2834
44	THIOPHANATE-METHYL	1652	2834
45	SPINETORAM	2602	2610
46	ETHEPHON	2568	2568
47	BROMOXYNIL	835	2519
48	DIAZINON	2442	2510
49	PYRACLOSTROBIN	2362	2504
50	CHLORANTRANILIPROLE	2447	2462