

Use Trends of Biopesticides: Pounds Applied

Text files of data are available at <<https://files.cdpr.ca.gov/pub/outgoing/pur/data/>>. The reported pounds of chemicals used that are biopesticides. Biopesticides include microorganisms and naturally occurring compounds, or compounds similar to those found in nature that are not toxic to the target pest (such as pheromones). Use includes both agricultural and reportable nonagricultural applications. The word "none" or "N/A" indicates no use at all that year. Values > 1 are rounded.

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
(3s, 6r)-3-methyl-6-isopropenyl-9-decen-1-yl acetate	N/A	<0.01	N/A	0	12	148	65	51	53	49
(3s, 6s)-3-methyl-6-isopropenyl-9-decen-1-yl acetate	N/A	<0.01	N/A	0	12	148	65	51	53	49
(e)-4-tridecen-1-yl acetate	N/A	23	N/A	N/A	N/A	0	0	0	N/A	N/A
(e)-5-decen-1-ol	0	0	1	8	2	2	45	51	28	1
(e)-5-decenol	3	1	7	8	95	5	6	2	1	3
(e)-5-decenyl acetate	7	4	17	134	99	63	746	840	463	26
(e,e)-9, 11-tetradecadien-1-yl acetate	4	3	3	1	12	2	0	0	0	0
(e,z)-7,9-dodecadien-1-yl acetate	24	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(s)-kinoprene	285	311	429	327	253	378	531	478	360	311
(s)-verbenone	N/A	N/A	781	633	28	5	26	12	14	2
(z)-11-hexadecen-1-yl acetate	N/A	N/A	N/A	0	98	34	30	92	294	335
(z)-11-hexadecenal	N/A	N/A	1	1	98	33	19	92	293	335

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
(z)-4-tridecen-1-yl-acetate	N/A	1	N/A	N/A	N/A	0	3	6	N/A	N/A
(z)-9-dodecenyl acetate	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(z,e)-7,11-hexadecadien-1-yl acetate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
(z,z)-11,13-hexadecadienal	321	619	969	1,072	1,086	1,404	1,846	1,511	1,644	2,263
(z,z)-3,13-octadecadien-1-ol acetate	<0.01	N/A	0	142	N/A	N/A	N/A	N/A	N/A	N/A
(z,z)-7,11-hexadecadien-1-yl acetate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
1,4-dimethylnaphthalene	1,163	1,085	891	660	133	836	379	274	411	1,520
1,7-dioxaspiro-(5,5)-undecane	1	0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1-methylcyclopropene	1	0	1	1	1	1	1	0	0	0
1-naphthaleneacetamide	19	22	18	14	11	17	11	11	1	6
2,4-decadienoic acid, ethyl ester, (2e,4z)-	N/A	0	4	3	3	2	1	48	4	0
2-methyl-1-butanol	0	0	0	0	1	0	1	1	2	2
3,7-dimethyl-6-octen-1-ol	54	42	49	72	95	98	70	62	60	42
3-decen-2-one	N/A	N/A	N/A	N/A	N/A	N/A	443	N/A	N/A	N/A
Acetic acid	43	62	20,806	9,111	5,357	4,248	1,508	2,007	286	571
Agrobacterium radiobacter	230	271	137	2,561	64	59	248	49	49	52

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agrobacterium radiobacter, strain k1026	34	0	0	<0.01	N/A	N/A	N/A	N/A	N/A	N/A
Allyl isothiocyanate	N/A	N/A	N/A	0	N/A	N/A	0	N/A	N/A	N/A
Almond, bitter	0	<0.01	0	N/A	<0.01	0	<0.01	<0.01	<0.01	<0.01
Amino ethoxy vinyl glycine hydrochloride	1,444	1,757	2,011	1,380	1,296	2,532	2,984	3,003	2,270	1,962
Ammonium bicarbonate	51	34	42	N/A	N/A	N/A	N/A	0	N/A	N/A
Ammonium nitrate	86,008	88,037	91,564	89,252	86,912	78,360	84,593	80,390	73,303	64,287
Ammonium nonanoate	1,937	3,131	3,399	27,356	19,625	17,272	5,421	8,751	9,007	10,777
Aspergillus flavus strain af36	4	8	9	14	15	16	18	20	24	22
Aureobasidium pullulans strain dsm 14940	81	458	356	1,095	2,493	3,956	2,794	2,355	2,209	1,652
Aureobasidium pullulans strain dsm 14941	81	458	356	1,095	2,493	3,956	2,794	2,355	2,209	1,652
Azadirachtin	3,387	4,323	5,108	4,774	4,884	4,424	4,586	6,191	6,655	11,251
Bacillus amyloliquefaciens strain d747	84,957	177,589	131,298	209,773	395,706	272,746	298,243	230,243	231,055	248,744
Bacillus amyloliquefaciens strain f727	N/A	N/A	N/A	N/A	N/A	N/A	N/A	32,134	17,773	30,001
Bacillus amyloliquefaciens strain mbi 600	0	N/A	N/A	15	79	275	699	1,300	1,595	3,351
Bacillus firmus (strain i-1582)	N/A	42	190	170	212	160	33	28	7	21

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bacillus mycoides isolate j	N/A	N/A	N/A	N/A	1,085	568	531	423	178	220
Bacillus popilliae	<0.01	0	0	<0.01	N/A	<0.01	N/A	N/A	N/A	N/A
Bacillus pumilus, strain qst 2808	6,249	7,957	8,123	7,890	9,239	7,552	7,734	10,181	8,701	7,329
Bacillus sphaericus 2362, serotype h5a5b, strain abts 1743 fermentation solids, spores and insecticidal toxins	10,500	10,499	12,357	13,122	16,362	10,812	11,726	10,812	7,198	6,876
Bacillus subtilis strain iab/bs03	N/A	N/A	N/A	N/A	N/A	5	48	18	166	53
Bacillus subtilis var. amyloliquefaciens strain fzb24	94	119	178	6	<0.01	N/A	N/A	N/A	N/A	N/A
Bacillus thuringiensis (berliner)	11	4	29	21	14	17	8	13	21	14
Bacillus thuringiensis (berliner), subsp. aizawai, gc-91 protein	13,265	18,776	16,771	18,882	34,178	45,073	54,344	58,210	58,261	66,017
Bacillus thuringiensis (berliner), subsp. aizawai, serotype h-7	359	333	184	73	118	48	548	43	82	40
Bacillus thuringiensis (berliner), subsp. israelensis, serotype h-14	2,588	4,932	6,633	5,829	5,957	5,563	8,430	5,871	5,597	4,234
Bacillus thuringiensis (berliner), subsp. kurstaki strain sa-12	8,311	7,971	8,579	9,804	2,218	563	352	404	414	244

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bacillus thuringiensis (berliner), subsp. kurstaki, serotype 3a,3b	53	41	18	34	76	91	27	4	7	4
Bacillus thuringiensis (berliner), subsp. kurstaki, strain eg 2348	500	514	344	645	396	8	0	0	0	N/A
Bacillus thuringiensis (berliner), subsp. kurstaki, strain sa-11	78,064	80,401	80,958	74,963	96,414	119,097	116,440	142,755	118,267	124,471
Bacillus thuringiensis (berliner), subsp. san diego	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A
Bacillus thuringiensis subspecies kurstaki strain bmp 123	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	N/A	N/A
Bacillus thuringiensis subspecies kurstaki, genetically engineered strain eg7841 lepidopteran active toxin	116	65	3	43	3	1	2,503	14,065	15,633	9,200
Bacillus thuringiensis var. kurstaki strain m-200	N/A	N/A	<0.01	N/A	<0.01	1	0	N/A	N/A	N/A
Bacillus thuringiensis var. kurstaki, genetically engineered strain eg7826	N/A	N/A	N/A	7	N/A	15	N/A	N/A	N/A	N/A

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bacillus thuringiensis, subsp. aizawai, strain abts-1857	29,863	49,186	55,914	72,261	92,931	88,725	118,092	129,650	149,323	161,994
Bacillus thuringiensis, subsp. aizawai, strain sd-1372, lepidopteran active toxin(s)	18	6	43	13	6	16	2	1	6	3
Bacillus thuringiensis, subsp. israelensis, strain am 65-52	56,363	49,610	55,727	80,137	73,504	75,322	66,789	74,906	67,925	58,255
Bacillus thuringiensis, subsp. kurstaki, strain abts-351, fermentation solids and solubles	83,415	111,388	95,487	117,903	134,880	121,693	160,878	132,211	127,267	112,966
Bacillus thuringiensis, subsp. kurstaki, strain hd-1	2,323	1,928	1,860	186	111	13	24	16	28	19
Bacillus thuringiensis, var. kurstaki delta endotoxins cry 1a(c) and cry 1c (genetically engineered) encapsulated in pseudomonas fluorescens (killed)	N/A	0	N/A	<0.01	N/A	5	N/A	0	0	N/A
Bacillus velezensis	1	2	3	3	4	3	3	2	2	2
Bacteriophage active against xanthomonas campestris pv. vesicatoria and pseudomonas syringae pv. tomato	<0.01	<0.01	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bacteriophages active against xylella fastidiosa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	<0.01
Balsam fir oil	0	0	1	0	N/A	0	<0.01	N/A	N/A	N/A
Beauveria bassiana hf 23	N/A	N/A	N/A	37	55	67	72	78	83	39
Beauveria bassiana strain ant-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	783	3,775	4,687
Beauveria bassiana strain gha	1,796	2,749	3,514	2,850	5,690	7,040	6,211	6,989	7,651	9,050
Beauveria bassiana strain ppri 5339	N/A	N/A	N/A	N/A	N/A	N/A	11	141	563	40
Beta-conglutin	N/A	N/A	6,762	6,099	7,383	4,314	2,968	4,819	6,915	11,816
Buffalo gourd root powder	25	5	6	8	3	73	33	7	96	N/A
Burkholderia rinojensis strain a396	N/A	2,829	58,593	53,655	115,528	216,387	412,625	553,797	527,557	587,377
Butyl mercaptan	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Calcium acetate	N/A	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	N/A
Calcium salts of phosphorous acid	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
Canola oil	28	61	97	247	286	2,177	2,833	3,051	1,446	1,482
Capsicum oleoresin	10	27	92	125	203	635	409	419	287	255
Carbon dioxide	21,186	18,297	17,675	25,366	26,359	36,307	73,226	38,421	45,292	41,042
Castor oil	0	8	0	4	N/A	3	N/A	15	1	8
Cerevisane (cell walls of saccharomyces cerevisiae strain las117)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	173
Chenopodium ambrosiodes near ambrosiodes	20,267	17,504	12,828	10,207	8,300	387	186	85	146	23

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Chromobacterium subtsugae strain praa4-1	30,262	46,419	45,917	31,445	36,395	42,933	39,024	37,379	28,651	34,569
Cinnamaldehyde	N/A	N/A	N/A	N/A	59	1	N/A	4,032	3,173	1,567
Citric acid	128,806	114,940	126,174	142,111	136,402	152,412	166,097	178,179	192,345	212,843
Clarified hydrophobic extract of neem oil	119,298	197,351	222,750	166,062	173,115	138,380	139,921	201,795	80,385	42,792
Codling moth granulosis virus	0	0	0	0	0	0	0	1	1	0
Coniothyrium minitans strain con/m/91-08	611	641	786	657	665	424	216	543	489	871
Corn syrup	3,216	3,344	4,342	4,850	14,787	22,773	18,305	16,166	13,984	19,565
Cottonseed oil	105,083	132,464	87,451	55,082	45,678	35,072	39,589	16,873	21,715	10,959
Coyote urine	3	9	6	3	6	3	3	3	2	27
Cytokinin (as kinetin)	<0.01	0	0	0	0	0	0	<0.01	0	<0.01
Diallyl disulfide	N/A	N/A	N/A	103	94	N/A	N/A	26	N/A	N/A
Dihydro-5-heptyl-2(3h)-furanone	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A
Dihydro-5-pentyl-2(3h)-furanone	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A
E,e-8,10-dodecadien-1-ol	2,276	1,395	1,445	1,079	5,420	1,209	863	1,220	966	1,327
E-11-tetradecen-1-yl acetate	142	61	73	32	295	40	8	12	2	5
E-8-dodecenyl acetate	273	224	339	390	1,714	271	323	537	199	224
Encapsulated delta endotoxin of bacillus thuringiensis var. kurstaki in killed pseudomonas fluorescens	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Essential oils	0	15	12	20	24	11	7	1	1	2

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Ethylene	1,359	1,333	1,683	1,299	1,248	953	1,022	904	828	1,531
Eugenol	0	1	0	1	0	0	N/A	N/A	N/A	0
Farnesol	21	17	20	29	38	39	28	25	24	17
Fenugreek	2	1	7	N/A	0	10	0	0	0	0
Ferric sodium edta	5,855	6,790	8,000	12,449	12,329	8,118	8,568	5,866	4,313	4,153
Fish oil	4,114	N/A	N/A	1,078	N/A	N/A	N/A	2,561	N/A	N/A
Formic acid	66	337	2,606	1,243	984	1,647	352	6,569	220	236
Fox urine	1	4	3	1	4	2	1	2	1	8
Gamma aminobutyric acid	42	15	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Garlic	2,832	1,392	667	849	529	1,127	1,098	1,556	1,141	736
Geraniol	54	42	49	72	95	98	70	62	60	42
German cockroach pheromone	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	N/A	N/A	N/A
Gibberellins	41,418	27,422	27,409	23,142	27,104	28,657	25,412	29,044	18,981	17,359
Gibberellins, potassium salt	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A
Gliocladium virens gl-21 (spores)	3,538	2,989	4,586	4,395	2,829	2,707	1,395	136	11	0
Glutamic acid	42	15	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gs-omega/kappa-hxtx-hv1a (versitide peptide)	N/A	N/A	N/A	0	N/A	3	22	1,423	3,880	11,986
Harpin protein	1	<0.01	N/A	0	<0.01	N/A	N/A	N/A	0	1
Heptyl butyrate	14	6	4	3	13	4	28	12	6	9
Hydrogen peroxide	47,239	49,826	74,419	130,417	312,065	355,410	460,533	565,398	565,387	430,997
Hydroprene	7,352	5,734	6,456	3,920	3,155	2,935	4,250	2,824	1,818	8,490
Iba	15	14	13	10	19	17	29	31	50	35
Indole	<0.01	N/A	<0.01	0	0	0	0	0	0	0
Iron hedta	92	120	91	170	213	113	157	185	186	185
Iron phosphate	2,119	2,007	2,071	2,250	3,482	2,837	3,208	3,543	2,682	3,639

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Isaria fumosorosea strain fe 9901	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	455
Kaolin	2,473,768	2,854,542	3,411,740	3,591,384	3,193,218	3,270,212	2,723,609	2,957,908	2,616,442	2,862,924
Kinoprene	8	33	17	10	1	0	0	2	1	3
Lactic acid	N/A	N/A	2	3	12	10	15	19	23	15
Lactose	7,143	6,616	7,855	8,501	8,889	7,959	8,192	7,402	7,575	6,814
Lagenidium giganteum (california strain)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Laminarin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25	196	228
Lauryl alcohol	449	293	501	319	2,566	309	230	437	260	357
Lavandulyl senecioate	477	3,166	507	1,035	1,312	2,282	4,190	3,325	2,689	3,159
Limonene	61,223	67,831	72,742	67,404	92,244	106,815	56,845	57,287	46,872	33,263
Linalool	72	62	93	15	11	2	1	0	<0.01	0
Margosa oil	12,189	22,585	26,019	32,493	25,061	13,756	41,100	39,013	51,551	70,163
Menthol	20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metarhizium anisopliae strain f52	89	121	20	54	2	1	1	0	N/A	N/A
Methoprene	1,350	3,556	1,390	1,271	1,064	764	801	1,719	704	1,018
Methyl anthranilate	1,237	634	672	789	1,118	958	1,208	1,396	1,581	1,537
Methyl eugenol	9	N/A	N/A	126	386	1,149	1,138	561	691	1,203
Methyl nonyl ketone	0	0	0	0	0	1	0	0	N/A	N/A
Methyl salicylate	N/A	N/A	N/A	N/A	0	0	N/A	N/A	1	N/A
Muscalure	13	17	23	30	44	60	20	14	15	10
Muscodor albus strain sa13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	270	N/A	N/A
Myristyl alcohol	91	60	102	65	520	63	47	89	53	73
Myrothecium verrucaria, dried fermentation solids & solubles, strain aarc-0255	26,005	17,675	30,810	26,033	22,923	23,021	21,639	22,057	11,418	13,030

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N6-benzyl adenine	183	184	230	221	161	198	477	364	274	272
Naa	15	12	18	11	100	11	14	20	9	7
Naa, ammonium salt	1,056	945	996	125	181	335	249	257	220	233
Naa, ethyl ester	3	5	3	38	10,502	13,162	13,844	7,899	7,051	3,554
Naa, potassium salt	53	15	2	934	1,017	607	613	599	578	874
Naa, sodium salt	2	1	0	0	N/A	N/A	1	N/A	N/A	N/A
Natamycin	0	1	1	1	0	N/A	96	288	6	44
Nerolidol	54	42	49	72	95	98	70	62	60	42
Nitrogen, liquified	594	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nonanoic acid	21,545	17,530	14,482	13,301	14,610	12,755	12,359	13,809	10,368	10,755
Nonanoic acid, other related	1,134	923	762	700	769	671	649	726	544	565
Nosema locustae spores	0	0	0	1	<0.01	<0.01	N/A	<0.01	<0.01	N/A
Oil of anise	0	<0.01	0	0	<0.01	<0.01	0	N/A	N/A	N/A
Oil of black pepper	1	1	0	0	0	0	0	0	0	0
Oil of cedarwood	N/A	N/A	0	<0.01	N/A	N/A	N/A	N/A	N/A	N/A
Oil of citronella	N/A	1	5	0	1	0	1	1	0	0
Oil of jojoba	135	376	44	19	2	N/A	12	N/A	N/A	N/A
Oil of lemon eucalyptus	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil of orange	N/A	N/A	198	386	1,360	479	487	506	382	242
Oxypurinol	N/A	0	N/A	N/A	N/A	N/A	N/A	<0.01	N/A	N/A
Paecilomyces fumosoroseus apopka strain 97	3,302	5,951	5,631	8,947	8,659	5,100	8,346	8,649	5,558	1,206
Pantoea agglomerans strain e325, nrri b-21856	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Phenylethyl propionate	701	712	185	96	140	34	20	15	42	8

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Phosphoric acid, monopotassium salt	1,918	374	9,585	15,002	11,445	10,125	3,350	275	N/A	N/A
Piperine	0	0	0	0	0	0	0	0	0	0
Polyhedral occlusion bodies (ob's) of the nuclear polyhedrosis virus of helicoverpa zea (corn earworm)	1	2	4	20	41	41	22	33	46	47
Polyoxin d, zinc salt	6,731	7,412	8,613	10,308	10,657	11,457	13,147	11,805	9,510	8,701
Potassium bicarbonate	239,909	223,547	318,119	462,830	489,086	350,416	470,621	314,301	196,314	227,270
Potassium phosphite	390,547	708,940	666,757	952,554	1,167,494	1,205,225	1,652,977	1,409,256	1,261,552	1,177,730
Potassium silicate	5,407	23,582	36,525	25,901	33,039	13,821	28,004	51,209	26,757	21,797
Potassium sorbate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A
Propylene glycol	86,335	90,353	87,138	91,155	103,909	108,383	122,442	104,067	99,345	84,745
Propyleneglycol monolaurate	203	44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pseudomonas chlororaphis subsp. aurantiaca strain afs009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,387	8,474	34,556
Pseudomonas fluorescens, strain a506	92	270	87	123	111	113	66	38	39	19
Pseudomonas syringae, strain esc-10	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Purpureocillium lilacinum strain 251	4,073	5,031	6,408	6,273	5,474	3,817	2,939	3,417	3,390	3,325
Putrescent whole egg solids	1	1	1	6	5	6	2	6	8	1
Pythium oligandrum dv74	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Qst 713 strain of dried bacillus subtilis	24,605	20,969	20,919	21,063	21,952	21,291	25,545	19,022	16,897	15,650
Quillaja	1,040	775	829	1,027	1,385	1,452	1,636	1,259	1,088	519
Reynoutria sachalinensis	15,355	16,105	18,362	23,508	23,644	20,086	23,468	23,883	19,695	15,275
S-abscisic acid	2,131	2,382	2,114	2,192	2,220	1,861	1,856	1,222	1,590	1,220
S-methoprene	2,331	2,524	2,781	3,220	3,133	4,077	11,698	4,200	3,838	4,734
Sawdust	4	N/A	N/A	1	N/A	N/A	N/A	0	13	7
Sesame oil	0	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A
Silver nitrate	N/A	N/A	N/A	<0.01	0	N/A	0	<0.01	1	1
Sodium bicarbonate	44	479	420	13,604	3,679	3	N/A	1	N/A	1
Sodium carbonate peroxyhydrate	295,762	463,448	244,233	261,347	165,621	329,252	276,394	277,896	266,624	293,915
Sodium chloride	119	211	216	128	81	110	147	82	158	195
Sodium lauryl sulfate	431	570	1,749	507	1,200	1,334	1,148	1,223	1,235	1,471
Sorbitol octanoate	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	0	N/A
Soybean oil	45,973	59,297	69,771	84,295	80,999	82,753	70,341	70,941	67,348	69,366
Streptomyces griseoviridis strain k61	10	11	18	5	4	2	1	0	0	0
Streptomyces lydicus wyc 108	3	3	3	4	3	2	4	2	2	2
Sucrose octanoate	188	98	203	29	7	N/A	N/A	N/A	N/A	N/A
Sugar	51	16	60	667	4	20	775	120	69	4
Swinglea glutinosa extract	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	18,636	13,032
Tea tree oil	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9	4
Thyme	1,135	1,150	257	122	181	25	11	9	9	3
Thyme oil	N/A	N/A	1	3	12	7	7	3	51	2
Thymol	398	314	278	570	564	679	162	455	181	392

Chemical	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Trichoderma harzianum rifai strain krl-ag2	186	86	65	112	64	86	95	80	116	157
Trichoderma icc 012 asperellum	43	2	2	9	4	1	32	24	50	81
Trichoderma icc 080 gamsii	43	2	2	9	4	1	32	24	50	81
Trimethylamine	0	N/A	<0.01	0	0	0	0	0	0	0
Ulocladium oudemansii (u3 strain)	29	792	516	155	34	2,131	1,444	836	595	375
Vanillin	0	0	1	N/A	<0.01	2	0	0	<0.01	0
Vegetable oil	315,218	267,446	485,628	517,951	665,971	828,425	669,353	581,767	454,058	520,302
Xanthine	N/A	0	N/A	N/A	N/A	N/A	N/A	<0.01	N/A	N/A
Yeast	80	32	86	14	4	12	0	0	30	<0.01
Yucca schidigera	12,327	5,652	2,565	3,130	2,173	5,733	6,806	4,935	6,510	15,306
Z,e-9,12-tetradecadien-1-yl acetate	14	122	20	10	21	62	159	20	70	91
Z-11-tetradecen-1-yl acetate	8	0	0	0	0	0	0	0	<0.01	0
Z-8-dodecenol	44	38	52	60	201	47	52	93	35	39
Z-8-dodecenyl acetate	3,467	3,248	3,765	4,300	6,479	4,157	4,052	8,201	3,082	3,394
Total	5,090,871	6,167,672	6,881,878	7,689,862	8,119,115	8,399,794	8,650,860	8,656,336	7,677,168	7,917,262