

Additional Information Request from NOSB (April 6, 2017)

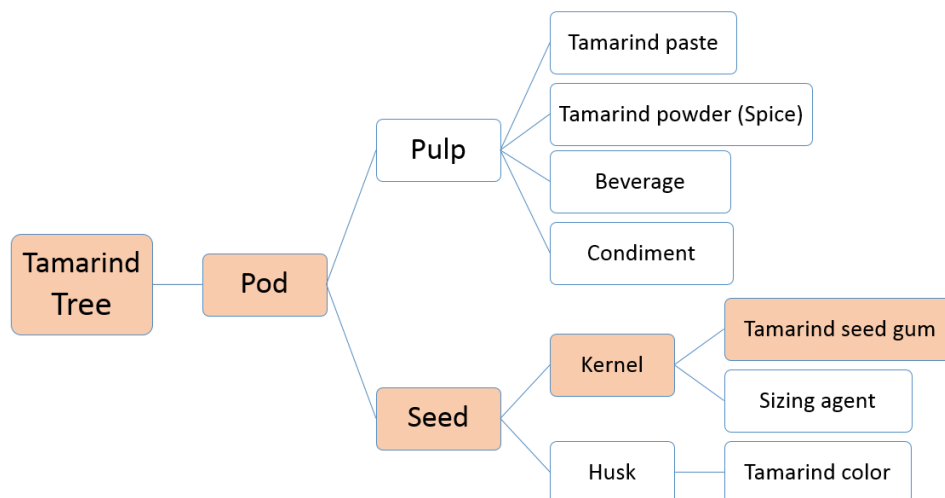
1. Supply Chain Limitations

There is limited information in the petition regarding the supply chain limitations for organic tamarind seeds. The petitioner should clarify and document that there are issues with either the quality or quantity of organic tamarind seeds available. Given that there are a number of suppliers of other organic tamarind products, why are organic tamarind seeds unavailable and what is the reason that organic tamarind seeds are not processed into an organic tamarind seed gum?

Response:

The fruit of the *Tamarindus indica L.* tree consists of a brown pod. The pod contains approximately 55% soft acidic pulp, 34 % seeds and 11% shell and fiber (Rao and Srivastava 1973). Tamarind seed gum (TSG) is manufactured from the tamarind seed. Seeds of the sour tamarind are obtained from the northern, northeastern, and central areas of Thailand and from southern and central India. No pesticides are applied during cultivation of these trees, which have strong natural resistance to infestation.

The black tamarind seeds are sieved and roasted. After cooling, the roasted seeds are placed in a rotary mixer, which removes black testa and the surface of the kernel powder. The remaining 70% is an off white kernel which is pulverized into tamarind kernel powder (TKP). DSP Gokyo Food & Chemical Co. Ltd purchases TKP from India and Thailand, the seeds from the TKP are also sourced from India and Thailand. TKP differs from the widely available tamarind powder. Tamarind powder (as is offered online as an organic ingredient) is obtained by drying and grinding the sticky pulp inside the pods. Tamarind powder can't be used as a raw material to manufacture TSG.



The tamarind tree can be a sweet or sour variety. The seeds of the sweet tamarind tree variety are too small to industrially produce TSG with a high quality or an acceptable yield, therefore only tamarind seeds from sour trees are used. Many commercial products are manufactured from the pulp and organic certified pulp is available due to consumer demand. However as highlighted below, consumer demand and the textile industry has never had a need for an organic certified sour seed. Thus, there is no supply chain established.

In India, a group certification program is employed based on the NPOP (National Programme for Organic Production). Organic certification is accredited by the governmental organization APEDA (The Agricultural and Processed Food Products Export Development Authority). Tamarind seeds are used mainly as a raw material for sizing agents for the textile industry and the highest quality seeds as used for the food industry to manufacture TSG.

There are several operators in India selling organic certified tamarind pulp which would mean that during growth and harvesting the entire pod including the seeds were organic certified. However, the manner in which seeds are sold in India doesn't allow for organic traceability. Seeds are collected throughout India and sold in local markets. Roasters purchase the seeds and remove the kernel for sale. The kernel is sold for TKP manufacturing in India.

In Thailand tamarind pulp is eaten as is or processed into condiments and beverages. Tamarind seeds are only used for the manufacture of TKP to manufacture TSG. DSP Gokyo is the only company purchasing TKP from Thailand. Additional labor is needed to collect the seeds for the manufacture of TKP. Therefore, most of the seeds from Thailand are discarded as waste material. Tamarind seeds are collected from wild tamarind trees spread across Thailand. Since collectors/operators are small-scale farmers they can't ensure a stable and sufficient supply alone. The above situation makes it difficult for organic certification.

The Organic agriculture in Thailand is in its infancy stage and the market size is small. http://ap.fftc.agnet.org/ap_db.php?id=734 The National Bureau of Agriculture Commodity and Food Standard (ACFS) works as an accreditation body, and the Department of Agriculture (DOA) works as the certification body. There is only one private certification body accredited by ACFS, named The Organic Agriculture Certification Thailand (ACT). We've been unsuccessful in contacting ACT on whether there is organic certified TKP in Thailand.

DSP Gokyo contacted many suppliers in India advertising organic tamarind seeds and organic TKP on the internet. We've had two responses, both suppliers couldn't supply organic certified TKP.

To add to this complexity, there are separate manufacturing plants for roasting and TKP production in India. TKP suppliers source from several roasters in India.

2. Manufacturing Process (Methyl Alcohol)

Are there alternatives to the use of methyl alcohol in the processing of the product that would meet organic standards?

Response:

There are no alternatives to methanol. The use of ethanol or isopropyl alcohol in place of methyl alcohol would result in TSG with a darker color and a higher residual content of protein and fat. The higher protein and fat content would impact the functionality and impair the dispersability of the powder.

3. Manufacturing Process (Inputs)

Describe further whether the non-agricultural inputs into the manufacturing process (methyl alcohol, sodium hydroxide, citric acid) are separated from the final product and if they change the chemical structure of the final product.

Response:

The chemical structure of TSG doesn't change during manufacture. The manufacturing process involves extracting the polysaccharide from the TKP.

Methanol: Methanol is removed to less than 50 ppm in the final products. The residual content of methanol is analyzed regularly by head-space gas chromatography. The representative analysis data of 5 lots is provided as follows:

Lot #	Methanol (µg/g)
16.09.05-1	9.1
16.09.07-1	11.9
16.09.10-2	13.9
16.09.11-1	13.5
16.09.12-3	8.2

Sodium hydroxide and citric acid: Sodium hydroxide (base) is neutralized with citric acid (acid) to generate sodium citrate (salt). Sodium citrate dissolves into the solution of methanol and the polysaccharide. In the dewatering process before drying, the methanol solution containing sodium citrate is separated from the polysaccharides. The ash content of the final product is around 0.4%, suggesting that sodium citrate is almost completely removed.

Methanol removes the water from the polysaccharides and this allows the polysaccharide molecules to form clumps which are too large to stay in solution. Sodium hydroxide works to remove the proteins from the polysaccharides by making the proteins solubilize into the solvent. Citric acid has no impact, as it is weak acid and added simply for neutralization.

4. Manufacturing Process (By-Products)

Describe the environmental impacts of the by-products from the manufacturing process of tamarind seed gum including the non-agricultural inputs added and the remaining solution after centrifugation.

Response:

Methanol: Methanol is not released into the air and has no environmental impact as the production line is sealed. Almost all of the methanol used is distilled and reused. The use of methanol is reported to the local government, emission standards are not set in their regulations.

Sodium hydroxide and citric acid: As described in Question 3, sodium citrate is generated by neutralization and dissolves into the solvent. The solvent containing sodium citrate is burnt in an incinerator and decomposed to CO₂, water and ash. These components are extremely small and don't impact the environment. The incinerator in the facility runs within the local government's emission standards.

Proteins, lipids and minerals which originated from the TKP: After the recovery of the methanol the protein, fat and minerals are burnt in an incinerator, and decomposed to CO₂, water and incinerated residue. The amount of CO₂ and water are extremely small and don't impact the environment. Incinerated residue is non-toxic and disposal is completed by an outsourced industrial waste company. The incinerator in the facility runs within the emission standards.

Reference: Rao PS, Srivastava HC (1973). *Industrial gums*, Whistler RL, editor. Academic press

Analytical results of pesticides residues in tamarind seed polysaccharide

Analysis date: October 2005

Analysis facility: Food Analysis Technology Center SUNATEC

Sample: Glyloid 2A (hot water soluble product of tamarind seed polysaccharide)

Analysis Method: GC/MS, LC/MS/MS

No	Items	Result (ppm)	Limit of determination (ppm)	No	Items	Result (ppm)	Limit of determination (ppm)
1	EPN	N.D.	0.05	52	CHLORPROPHAM	N.D.	0.05
2	XMC	N.D.	0.05	53	CHLOROBENZILATE	N.D.	0.05
3	ACRINATHRIN	N.D.	0.05	54	SALITHION	N.D.	0.05
4	AZACONAZOLE	N.D.	0.05	55	CYANAZINE	N.D.	0.05
5	AZINPHOS-METHYL	N.D.	0.05	56	CYANOPHOS	N.D.	0.05
6	ACETOCHLOR	N.D.	0.05	57	DIETHOFENCARB	N.D.	0.05
7	AZOXYSTROBIN	N.D.	0.05	58	DICHLUFENTHION	N.D.	0.05
8	ATRAZINE	N.D.	0.05	59	DICLOBUTRAZOL	N.D.	0.05
9	ANILOFOS	N.D.	0.05	60	DICLOFOP-METHYL	N.D.	0.05
10	AMETRYN	N.D.	0.05	61	DICHLORAN	N.D.	0.05
11	ALACHLOR	N.D.	0.05	62	DICHLORVOS	N.D.	0.05
12	ALLIDOCHLOR	N.D.	0.05	63	DICOFOL	N.D.	0.05
13	ALLETHRIN	N.D.	0.05	64	DITHIOPYR	N.D.	0.05
14	ISAZOPHOS	N.D.	0.05	65	CYHALOTHRIN	N.D.	0.05
15	ISOFENPHOS	N.D.	0.05	66	CYHALOFOP-BUTYL	N.D.	0.05
16	ISOPROCARB	N.D.	0.05	67	DIPHENAMID	N.D.	0.05
17	ISOPROTHIOLANE	N.D.	0.05	68	DIPHENYLAMINE	N.D.	0.05
18	IPROVALICARB	N.D.	0.05	69	DIFENOCONAZOLE	N.D.	0.05
19	IPROBENFOS	N.D.	0.05	70	CYFLUTHRIN	N.D.	0.05
20	INDOXACARB	N.D.	0.05	71	CYFLUFENAMID	N.D.	0.05
21	UNICONAZOLE P	N.D.	0.05	72	CYPRODINIL	N.D.	0.05
22	ESPROCARB	N.D.	0.05	73	CYPERMETHRIN	N.D.	0.05
23	ETHALFLURALIN	N.D.	0.05	74	SIMAZINE	N.D.	0.05
24	ETHION	N.D.	0.05	75	SIMECONAZOLE	N.D.	0.05
25	EDIFENPHOS	N.D.	0.05	76	DIMETHAMETRYN	N.D.	0.05
26	ETOXAZOLE	N.D.	0.05	77	DIMETHIPIN	N.D.	0.05
27	ETHOPROPHOS	N.D.	0.05	78	DIMETHYLVINPHOS	N.D.	0.05
28	ETOBENZANID	N.D.	0.05	79	DIMETHENAMID	N.D.	0.05
29	ETRIMFOS	N.D.	0.05	80	DIMETHOATE	N.D.	0.05
30	ENDOSULFAN (α , β)	N.D.	0.05	81	DIMEPIPERATE	N.D.	0.05
31	OXADIAZON	N.D.	0.05	82	TERBACIL	N.D.	0.05
32	OXYFLUORFEN	N.D.	0.05	83	DIAZINON	N.D.	0.05
33	CADUSAFOS	N.D.	0.05	84	THIAZOPYR	N.D.	0.05
34	CAFENSTROLE	N.D.	0.05	85	THIOBENCARB	N.D.	0.05
35	CARFENTRAZONE-ETHYL	N.D.	0.05	86	THIFLUZAMIDE	N.D.	0.05
36	CARBOFURAN	N.D.	0.05	87	TECNAZENE	N.D.	0.05
37	QUINALPHOS	N.D.	0.05	88	TETRACHLORVINPHOS	N.D.	0.05
38	QUINOXYFEN	N.D.	0.05	89	TETRACONAZOLE	N.D.	0.05
39	QUINOCLAMINE (CAN)	N.D.	0.05	90	TETRADIFON	N.D.	0.05
40	QUINTOZENE	N.D.	0.05	91	THENYLCHLOR	N.D.	0.05
41	KRESOXIM-METHYL	N.D.	0.05	92	TEBUCONAZOLE	N.D.	0.05
42	CLOQUINTOCET-MEXYL	N.D.	0.05	93	TEBUFENPYRAD	N.D.	0.05
43	CLODINAFOP-PROPARGYL	N.D.	0.05	94	TEFLUTHRIN	N.D.	0.05
44	CLOMAZONE	N.D.	0.05	95	DELTAMETHRIN	N.D.	0.05
45	CLOMEPROP	N.D.	0.05	96	TERBUTRYN	N.D.	0.05
46	CHLORTHAL-DIMETHYL	N.D.	0.05	97	TERBUFOS	N.D.	0.05
47	CHLORDANE	N.D.	0.05	98	TRIADIMENOL	N.D.	0.05
48	CHLORPYRIFOS	N.D.	0.05	99	TRIADIMEFON	N.D.	0.05
49	CHLORPYRIFOS-METHYL	N.D.	0.05	100	TRIAZOPHOS	N.D.	0.05
50	CHLORFENAPYR	N.D.	0.05	101	TRI-ALLATE	N.D.	0.05
51	CHLORFENVINPHOS	N.D.	0.05	102	TRIBUPHOS	N.D.	0.05

N.D.: not detected

No	Items	Result (ppm)	Limit of determination (ppm)	No	Items	Result (ppm)	Limit of determination (ppm)
103	TRIFLURALIN	N.D.	0.05	154	FLUTOLANIL	N.D.	0.05
104	TRIFLOXYSTROBIN	N.D.	0.05	155	FLUVALINATE	N.D.	0.05
105	TOLCLOFOS-METHYL	N.D.	0.05	156	FLUFENOXURON	N.D.	0.05
106	NAPROPAMIDE	N.D.	0.05	157	FLUMIOXAZIN	N.D.	0.05
107	NITROTHAL-ISOPROPYL	N.D.	0.05	158	FLUMICLORAC PENTYL	N.D.	0.05
108	PACLOBUTRAZOL	N.D.	0.05	159	PRETILACHLOR	N.D.	0.05
109	PARATHION	N.D.	0.05	160	PROCHLORAZ	N.D.	0.05
110	PARATHION-METHYL	N.D.	0.05	161	PROCYMIDONE	N.D.	0.05
111	HALFENPROX	N.D.	0.05	162	PROTHIOFOS	N.D.	0.05
112	PICOLINAFEN	N.D.	0.05	163	PROPACHLOR	N.D.	0.05
113	BIFENOX	N.D.	0.05	164	PROPAPHOS	N.D.	0.05
114	BIFENTHRIN	N.D.	0.05	165	PROPICONAZOLE	N.D.	0.05
115	PIPEROPHOS	N.D.	0.05	166	PROPYZAMIDE	N.D.	0.05
116	PYRACLOFOS	N.D.	0.05	167	PROPHAM	N.D.	0.05
117	PYRAZOPHOS	N.D.	0.05	168	PROFENOFOS	N.D.	0.05
118	PYRAFLUFEN ETHYL	N.D.	0.05	169	PROPOXUR	N.D.	0.05
119	PYRIDAFENTHION	N.D.	0.05	170	PROMECARB	N.D.	0.05
120	PYRIDABEN	N.D.	0.05	171	PROMETRYN	N.D.	0.05
121	PYRIBUTICARB	N.D.	0.05	172	BROMOBUTIDE	N.D.	0.05
122	PYRIMIDIFEN	N.D.	0.05	173	BROMOPROPYLATE	N.D.	0.05
123	PYRIMINOBAC-METHYL	N.D.	0.05	174	BROMOPHOS	N.D.	0.05
124	PIRIMIPHOS-METHYL	N.D.	0.05	175	HEXYTHIAZOX	N.D.	0.05
125	PYRIMETHANIL	N.D.	0.05	176	BENALAXYL	N.D.	0.05
126	VINCLOZOLIN	N.D.	0.05	177	BENOXACOR	N.D.	0.05
127	FIPRONIL	N.D.	0.05	178	PERMETHRIN	N.D.	0.05
128	FENAMIPHOS	N.D.	0.05	179	PENCONAZOLE	N.D.	0.05
129	FENARIMOL	N.D.	0.05	180	PENCYCURON	N.D.	0.05
130	FENITROTHION	N.D.	0.05	181	BENDIOCARB	N.D.	0.05
131	FENOXANIL	N.D.	0.05	182	PENDIMETHALIN	N.D.	0.05
132	FENOXYCARB	N.D.	0.05	183	BENFLURALIN	N.D.	0.05
133	FENOTHIOCARB	N.D.	0.05	184	PHOSALONE	N.D.	0.05
134	FENOBUICARB	N.D.	0.05	185	FOSTHIAZATE	N.D.	0.05
135	FENCHLORPHOS	N.D.	0.05	186	PHOSPHAMIDON	N.D.	0.05
136	FENSULFOTHION	N.D.	0.05	187	FONOFOS	N.D.	0.05
137	FENTHION	N.D.	0.05	188	PHORATE	N.D.	0.05
138	PHENTHOATE	N.D.	0.05	189	MALATHION	N.D.	0.05
139	FENVALERATE	N.D.	0.05	190	MYCLOBUTANIL	N.D.	0.05
140	FENPROPATHRIN	N.D.	0.05	191	METHACRIFOS	N.D.	0.05
141	BUTACHLOR	N.D.	0.05	192	METHAMIDOPHOS	N.D.	0.05
142	BUTAFENACIL	N.D.	0.05	193	METALAXYL	N.D.	0.05
143	BUTAMIFOS	N.D.	0.05	194	METHIDATHION	N.D.	0.05
144	FTHALIDE	N.D.	0.05	195	METOMINOSTROBIN	N.D.	0.05
145	BUPIRIMATE	N.D.	0.05	196	METOLACHLOR	N.D.	0.05
146	BUPROFEZIN	N.D.	0.05	197	MEVINPHOS	N.D.	0.05
147	FURATHIOCARB	N.D.	0.05	198	MEPRONIL	N.D.	0.05
148	FLAMPROP-METHYL	N.D.	0.05	199	MOLINATE	N.D.	0.05
149	FURILAZOLE	N.D.	0.05	200	LACTOFEN	N.D.	0.05
150	FLUACRYPYRIM	N.D.	0.05	201	BHC	N.D.	0.05
151	FLUQUINCONAZOLE	N.D.	0.05	202	DDT	N.D.	0.05
152	FLUCYTHRINATE	N.D.	0.05	203	ENDRIN	N.D.	0.05
153	FLUSILAZOLE	N.D.	0.05	204	DIELDRIN	N.D.	0.05

N.D.: not detected

Analytical results of pesticides residues in tamarind seed polysaccharide

Analysis date: October 2005

Analysis facility: Food Analysis Technology Center SUNATEC

Sample: Glyloid 3S (cold water soluble product of tamarind seed polysaccharide)

Analysis Method: GC/MS, LC/MS/MS

No	Items	Result (ppm)	Limit of determination (ppm)	No	Items	Result (ppm)	Limit of determination (ppm)
1	EPN	N.D.	0.05	52	CHLORPROPHAM	N.D.	0.05
2	XMC	N.D.	0.05	53	CHLOROBENZILATE	N.D.	0.05
3	ACRINATHRIN	N.D.	0.05	54	SALITHION	N.D.	0.05
4	AZACONAZOLE	N.D.	0.05	55	CYANAZINE	N.D.	0.05
5	AZINPHOS-METHYL	N.D.	0.05	56	CYANOPHOS	N.D.	0.05
6	ACETOCHLOR	N.D.	0.05	57	DIETHOFENCARB	N.D.	0.05
7	AZOXYSTROBIN	N.D.	0.05	58	DICHLUFENTHION	N.D.	0.05
8	ATRAZINE	N.D.	0.05	59	DICLOBUTRAZOL	N.D.	0.05
9	ANILOFOS	N.D.	0.05	60	DICLOFOP-METHYL	N.D.	0.05
10	AMETRYN	N.D.	0.05	61	DICHLORAN	N.D.	0.05
11	ALACHLOR	N.D.	0.05	62	DICHLORVOS	N.D.	0.05
12	ALLIDOCHLOR	N.D.	0.05	63	DICOFOL	N.D.	0.05
13	ALLETHRIN	N.D.	0.05	64	DITHIOPYR	N.D.	0.05
14	ISAZOPHOS	N.D.	0.05	65	CYHALOTHRIN	N.D.	0.05
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17	ISOPROTHIOLANE	N.D.	0.05	68	DIPHENYLAMINE	N.D.	0.05
18	IPROVALICARB	N.D.	0.05	69	DIFENOCONAZOLE	N.D.	0.05
19	IPROBENFOS	N.D.	0.05	70	CYFLUTHRIN	N.D.	0.05
20	INDOXACARB	N.D.	0.05	71	CYFLUFENAMID	N.D.	0.05
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22	ESPROCARB	N.D.	0.05	73	CYPERMETHRIN	N.D.	0.05
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24	ETHION	N.D.	0.05	75	SIMECONAZOLE	N.D.	0.05
25	EDIFENPHOS	N.D.	0.05	76	DIMETHAMETRYN	N.D.	0.05
26	ETOXAZOLE	N.D.	0.05	77	DIMETHIPIN	N.D.	0.05
27	ETHOPROPHOS	N.D.	0.05	78	DIMETHYLVINPHOS	N.D.	0.05
28	ETOBENZANID	N.D.	0.05	79	DIMETHENAMID	N.D.	0.05
29	ETRIMFOS	N.D.	0.05	80	DIMETHOATE	N.D.	0.05
30	ENDOSULFAN (α , β)	N.D.	0.05	81	DIMEPIPERATE	N.D.	0.05
31	OXADIAZON	N.D.	0.05	82	TERBACIL	N.D.	0.05
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38	QUINOXYFEN	N.D.	0.05	89	TETRACONAZOLE	N.D.	0.05
39	QUINOCLAMINE (CAN)	N.D.	0.05	90	TETRADIFON	N.D.	0.05
40	QUINTOZENE	N.D.	0.05	91	THENYLCHLOR	N.D.	0.05
41	KRESOXIM-METHYL	N.D.	0.05	92	TEBUCONAZOLE	N.D.	0.05
42	CLOQUINTOCET-MEXYL	N.D.	0.05	93	TEBUFENPYRAD	N.D.	0.05
43	CLODINAFOF-PROPARGYL	N.D.	0.05	94	TEFLUTHRIN	N.D.	0.05
44	CLOMAZONE	N.D.	0.05	95	DELTAMETHRIN	N.D.	0.05
45	CLOMEPROP	N.D.	0.05	96	TERBUTRYN	N.D.	0.05
46	CHLORTHAL-DIMETHYL	N.D.	0.05	97	TERBUFOS	N.D.	0.05
47	CHLORDANE	N.D.	0.05	98	TRIADIMENOL	N.D.	0.05
48	CHLORPYRIFOS	N.D.	0.05	99	TRIADIMEFON	N.D.	0.05
49	CHLORPYRIFOS-METHYL	N.D.	0.05	100	TRIAZOPHOS	N.D.	0.05
50	CHLORFENAPYR	N.D.	0.05	101	TRI-ALLATE	N.D.	0.05
51	CHLORFENVINPHOS	N.D.	0.05	102	TRIBUPHOS	N.D.	0.05

N.D.: not detected

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104	TRIFLOXYSTROBIN	N.D.	0.05	155	FLUVALINATE	N.D.	0.05
105	TOLCLOFOS-METHYL	N.D.	0.05	156	FLUFENOXURON	N.D.	0.05
106	NAPROPAMIDE	N.D.	0.05	157	FLUMIOXAZIN	N.D.	0.05
107	NITROTHAL-ISOPROPYL	N.D.	0.05	158	FLUMICLORAC PENTYL	N.D.	0.05
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109	PARATHION	N.D.	0.05	160	PROCHLORAZ	N.D.	0.05
110	PARATHION-METHYL	N.D.	0.05	161	PROCYMIDONE	N.D.	0.05
111	HALFENPROX	N.D.	0.05	162	PROTHIOFOS	N.D.	0.05
112	PICOLINAFEN	N.D.	0.05	163	PROPACHLOR	N.D.	0.05
113	BIFENOX	N.D.	0.05	164	PROPAPHOS	N.D.	0.05
114	BIFENTHRIN	N.D.	0.05	165	PROPICONAZOLE	N.D.	0.05
115	PIPEROPHOS	N.D.	0.05	166	PROPYZAMIDE	N.D.	0.05
116	PYRACLOFOS	N.D.	0.05	167	PROPHAM	N.D.	0.05
117	PYRAZOPHOS	N.D.	0.05	168	PROFENOFOS	N.D.	0.05
118	PYRAFLUFEN ETHYL	N.D.	0.05	169	PROPOXUR	N.D.	0.05
119	PYRIDAFENTHION	N.D.	0.05	170	PROMECARB	N.D.	0.05
120	PYRIDABEN	N.D.	0.05	171	PROMETRYN	N.D.	0.05
121	PYRIBUTICARB	N.D.	0.05	172	BROMOBUTIDE	N.D.	0.05
122	PYRIMIDIFEN	N.D.	0.05	173	BROMOPROPYLATE	N.D.	0.05
123	PYRIMINOBAC-METHYL	N.D.	0.05	174	BROMOPHOS	N.D.	0.05
124	PIRIMIPHOS-METHYL	N.D.	0.05	175	HEXYTHIAZOX	N.D.	0.05
125	PYRIMETHANIL	N.D.	0.05	176	BENALAXYL	N.D.	0.05
126	VINCLOZOLIN	N.D.	0.05	177	BENOXACOR	N.D.	0.05
127	FIPRONIL	N.D.	0.05	178	PERMETHRIN	N.D.	0.05
128	FENAMIPHOS	N.D.	0.05	179	PENCONAZOLE	N.D.	0.05
129	FENARIMOL	N.D.	0.05	180	PENCYCURON	N.D.	0.05
130	FENITROTHION	N.D.	0.05	181	BENDIOCARB	N.D.	0.05
131	FENOXANIL	N.D.	0.05	182	PENDIMETHALIN	N.D.	0.05
132	FENOXYCARB	N.D.	0.05	183	BENFLURALIN	N.D.	0.05
133	FENOTHIOCARB	N.D.	0.05	184	PHOSALONE	N.D.	0.05
134	FENOBUCCARB	N.D.	0.05	185	FOSTHIAZATE	N.D.	0.05
135	FENCHLORPHOS	N.D.	0.05	186	PHOSPHAMIDON	N.D.	0.05
136	FENSULFOTHION	N.D.	0.05	187	FONOFOS	N.D.	0.05
137	FENTHION	N.D.	0.05	188	PHORATE	N.D.	0.05
138	PHENTHOATE	N.D.	0.05	189	MALATHION	N.D.	0.05
139	FENVALERATE	N.D.	0.05	190	MYCLOBUTANIL	N.D.	0.05
140	FENPROPATHRIN	N.D.	0.05	191	METHACRIFOS	N.D.	0.05
141	BUTACHLOR	N.D.	0.05	192	METHAMIDOPHOS	N.D.	0.05
142	BUTAFENACIL	N.D.	0.05	193	METALAXYL	N.D.	0.05
143	BUTAMIFOS	N.D.	0.05	194	METHIDATHION	N.D.	0.05
144	FTHALIDE	N.D.	0.05	195	METOMINOSTROBIN	N.D.	0.05
145	BUPIRIMATE	N.D.	0.05	196	METOLACHLOR	N.D.	0.05
146	BUPROFEZIN	N.D.	0.05	197	MEVINPHOS	N.D.	0.05
147	FURATHIOCARB	N.D.	0.05	198	MEPRONIL	N.D.	0.05
148	FLAMPROP-METHYL	N.D.	0.05	199	MOLINATE	N.D.	0.05
149	FURILAZOLE	N.D.	0.05	200	LACTOFEN	N.D.	0.05
150	FLUACRYPYRIM	N.D.	0.05	201	BHC	N.D.	0.05
151	FLUQUINCONAZOLE	N.D.	0.05	202	DDT	N.D.	0.05
152	FLUCYTHRINATE	N.D.	0.05	203	ENDRIN	N.D.	0.05
153	FLUSILAZOLE	N.D.	0.05	204	DIELDRIN	N.D.	0.05

N.D.: not detected