FUMIGANT USE IN CALIFORNIA

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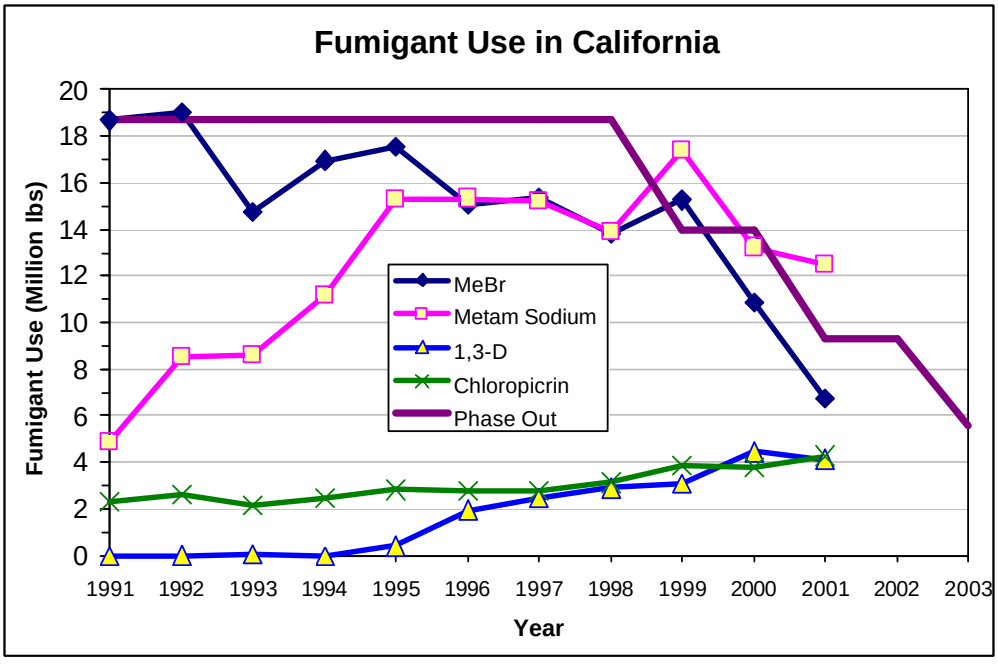
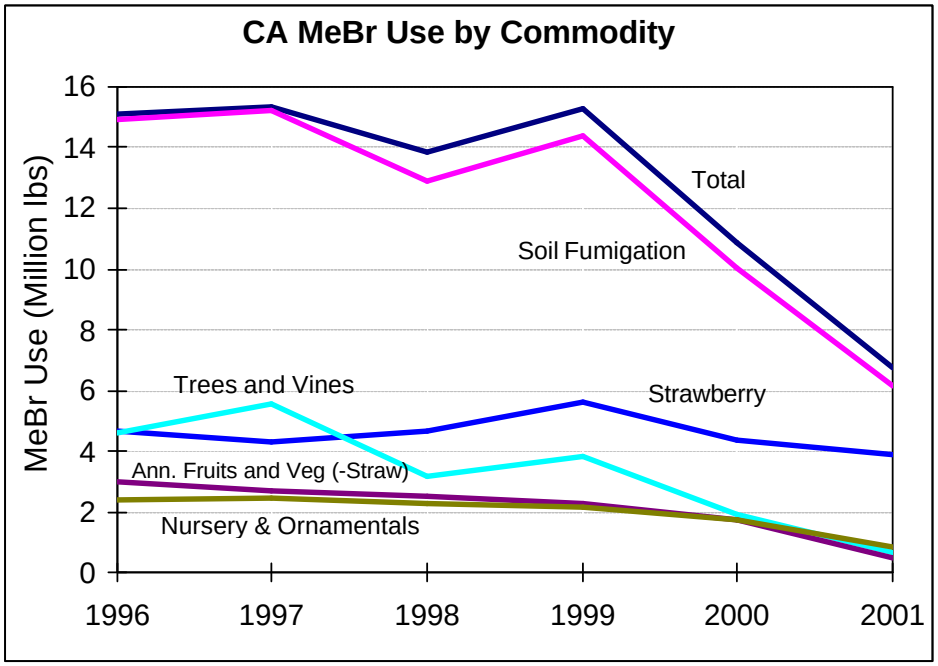
The Pesticide Use Reporting (PUR) requirements in California allow accurate estimation of the use of fumigants in the state. The PUR database compiled by CA Dept of Pesticide Regulation (CDPR) was used to generate the information in this paper. The figure below shows the use trends since 1991 for the 4 primary soil fumigants, methyl bromide (MeBr), 1,3-Dichloropropene (1,3-D) (Telone® products), metam sodium, and chloropicrin, along with the MeBr phase out allowances based on reductions from 1991 use.

Use of MeBr has declined gradually since 1991. By 1998, the use was about 75% of the 1991 use. In 1999, the MeBr use increased, due mainly to an increase in fumigated acreage of trees, vines, and strawberries, but was still near the 25% reduction in production/importation of MeBr required by the Montreal Protocol. In 2000 and 2001, the use of MeBr dropped dramatically, likely the result of a dramatic price increase (to over $3.00 per lb compared to about $1.00 before 1997) and restrictive California regulations. In 2003, production/importation is limited to 30% of baseline (1991) levels, or about 700,000 pounds below the 2001 level. The reduction will likely be achieved through full or partial substitution of alternative fumigants, and reduced fumigated acreage of some crops. Use above these phaseout levels is allowed for Quarantine and Preshipment. Certified nursery production is currently considered a Quarantine exemption by US EPA. After 2004, certain uses may qualify as Critical Use Exemptions.





Most MeBr use in California is for preplant soil fumigation; about 5% is for post-harvest commodity fumigation and less than 5% of use is for structural fumigation. In the mid-nineties, strawberries and perennial crops both used about one-third of the CA consumption, with the other third used on fruits and vegetables and nursery/ornamental crops. As the phase out has progressed and the price increased, strawberry use has continued while use for other fruits and vegetables, orchards and vineyards has declined dramatically. In 2001, 2/3 of MeBr use was for strawberries.

Use of metam sodium increased from 1991 through 1995 and its total use for soil fumigation surpassed MeBr in 1999. Although use has dropped since 1999, it was still applied to nearly twice as many acres as MeBr and Telone combined. As a low cost fumigant alternative, it is used mainly on annual vegetable and fruit crops such as carrots, processing tomato and potato.

Since 1,3-D was re-introduced in California in 1995, use of this product has increased substantially for certain crops. As an effective nematicide, it is used mainly for replant of perennial fruit and nut trees and vineyards and on high value crops that suffer significant nematode damage (carrot, sweet potato, melon, potato, tomato). In 2001, 2 ½ times more orchards and vineyards and 5 times more fruits and vegetables acres were fumigated with 1,3-D than with MeBr. I expect 1,3-D use to exceed MeBr use in 2003.

In 2001, drip-irrigation-applied formulations of 1,3-D were registered (*Telone II EC* and *InLine* (Telone C-35 EC). These products were used on 2300 ac. of strawberry, pepper, and melon in 2001, and 4500 ac of these crops in 2002. About 10% of the CA strawberry crop was drip fumigated in 2002, and I expect

this to increase to over 15% in 2003. Essentially all 1,3-D used for strawberries is drip applied.

Chloropicrin use has remained fairly steady through the years until 1999 when it's use increased, due to increasing proportions of chloropicrin in MeBr/chloropicrin mixtures. It is used as a fungicide for strawberry and some other annual crops in combination with MeBr and 1,3-D, and is used as a "marker" for much methyl bromide use. It was used as the primary fumigant on 2800 acres in 2001. A few orchard growers are beginning to use chloropicrin.

The following tables give fumigant use in CA since 1996. I have assembled the 1996 - 2001 California fumigant data into an ACCESS database (2002 data was not yet available at the time of this writing). It contains 100,000 individual fumigation records. If you desire additional or more detailed information (for example for certain counties or townships), contact me.

Methyl Bromide and 1,3-D Use in California - 1996 - 2001 (1000 lbs). (Adapted from Ca DPR PUR Database)

	Methyl Bromide						1,3-Dichloropropene					
Commoditv	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***
Grape	2,059	2,137	1,181	1,579	997	241	62	288	223	347	737	754
Tree Fruit - Prunus	872	1,200	771	1,042	355	209	260	79	169	201	562	711
Citrus	146	128	112	154	116	24	20	34	16	25	12	41
Almond	732	1,303	639	395	226	99	108	63	135	186	263	143
Walnut	620	570	362	470	174	64	15	26	83	85	89	138
Bushberry	29	87	64	137	150	135	0	0	2	4	14	30
Perennial - other	159	253	103	194	54	33	21	21	15	48	159	65
Total Perennial	**4,617**	**5,678**	**3,233**	**3,971**	**2,073**	**806**	**487**	**511**	**643**	**896**	**1,836**	**1,882**
Strawberry	**4,666**	**4,335**	**4,685**	**5,643**	**4,346**	**3,913**	**0**	**15**	**3**	**1**	**17**	**150**
Sweet Potato	622	770	547	445	360	0	73	75	278	193	499	579
Pepper	363	340	406	529	397	163	72	20	53	55	52	100
Melons	555	374	499	472	347	71	100	188	191	166	280	246
Tomato	341	276	305	423	208	124	63	43	116	252	171	35
Carrot	392	149	5	0	18	4	731	929	919	865	789	405
Potato	0	1	0	0	6	0	94	264	180	165	236	66
Leafy Vegetables	468	436	382	242	259	111	76	68	94	64	88	53
Cole crops	60	102	63	57	39	5	112	134	161	177	101	105
Vegetable - misc	197	251	295	135	96	39	58	28	32	47	74	91
Total Ann. Fruit & Veg	**7,665**	**7,034**	**7,187**	**7,948**	**6,075**	**4,432**	**1,380**	**1,763**	**2,026**	**1,985**	**2,307**	**1,829**
Field Crops	134	36	94	12	12	39	53	39	29	57	80	23
Nursery - Outdoor	1,785	1,649	1,647	1,617	1,198	550	36	128	103	95	217	372
Nursery - Greenhouse	12	11	15	3	4	7	0	0	0	0	0	0
Cut Flowers	527	622	527	409	382	218	0	0	61	6	1	18
Ornamentals	108	175	121	145	151	57	1	15	0	0	0	2
Misc Agriculture	65	24	33	248	78	48	0	0	20	48	5	11
Misc Non-Agri	2	5	43	46	76	6	0	0	10	6	0	0
Total Soil Fumigation	**14,915**	**15,233**	**12,899**	**14,397**	**10,048**	**6,163**	**1,957**	**2,457**	**2,891**	**3,095**	**4,445**	**4,138**
Post Harvest	138	115	346	377	331	349	0	0	0	0	0	3
Structural	3	4	389	316	277	21	0	0	2	0	0	0
Miscellaneous	11	8	211	166	226	207	0	0	0	0	0	0
Total Fumigation	**15,067**	**15,361**	**13,845**	**15,256**	**10,883**	**6,740**	**1,957**	**2,457**	**2,894**	**3,095**	**4,445**	**4,140**

Metam Sodium and Chloropicrin Use in California - 1996 - 2001 (1000 lbs). (Adapted from Ca DPR PUR Database)

	Metam Sodium						Chloropicrin					
Commodity	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***
Grape	62	58	17	24	54	25	10	16	10	10	38	17
Tree Fruit - Prunus	9	1	0	8	10	4	2	7	12	11	37	6
Citrus	81	27	9	17	31	1	0	4	0	0	8	17
Almond	8	20	7	27	10	24	1	2	9	4	13	31
Walnut	8	7	13	2	89	18	1	1	4	3	30	16
Bushberry	0	8	0	1	0	3	16	46	32	77	104	122
Perennial - other	33	1	11	7	8	4	2	9	2	9	20	9
Total Perennial	**202**	**123**	**57**	**86**	**202**	**79**	**33**	**85**	**68**	**115**	**249**	**218**
Strawberry	15	17	142	146	63	88	2,109	1,994	2,157	2,788	2,430	3,117
Sweet Potato	314	248	205	358	99	151	3	3	5	3	2	1
Pepper	248	252	221	422	479	571	43	44	48	67	142	151
Melons	412	678	625	875	464	674	0	9	21	71	48	71
Tomato	3,925	3,363	2,842	4,054	2,995	2,500	80	83	93	154	113	140
Carrot	4,603	5,831	5,797	6,571	5,576	5,129	3	8	26	0	0	0
Potato	1,533	1,271	1,202	2,075	1,184	845	0	0	0	0	4	9
Leafy Vegetables	924	549	710	352	528	419	101	100	122	106	171	90
Cole crops	576	472	258	259	184	215	10	5	8	11	28	10
Vegetable - misc	378	577	792	673	518	869	73	63	94	115	98	102
Total Ann. Fruit & Veg	**12,928**	**13,260**	**12,794**	**15,785**	**12,090**	**11,460**	**2,422**	**2,310**	**2,575**	**3,315**	**3,035**	**3,690**
Field Crops	1,924	1,548	634	883	583	543	9	4	3	0	4	8
Nursery - Outdoor	145	133	161	115	87	179	225	199	282	218	338	233
Nursery - Greenhouse	0	0	0	1	0	7	2	1	1	0	2	3
Cut Flowers	10	17	14	101	116	39	53	70	74	128	117	93
Ornamentals	46	113	78	118	38	9	1	11	2	3	14	14
Misc Agriculture	71	11	20	212	12	45	34	67	121	72	22	18
Misc Non-Agri	2	11	161	103	77	107	23	21	1	2	2	0
Total Soil Fumigation	**15,328**	**15,215**	**13,918**	**17,404**	**13,205**	**12,468**	**2,802**	**2,768**	**3,128**	**3,854**	**3,783**	**4,276**