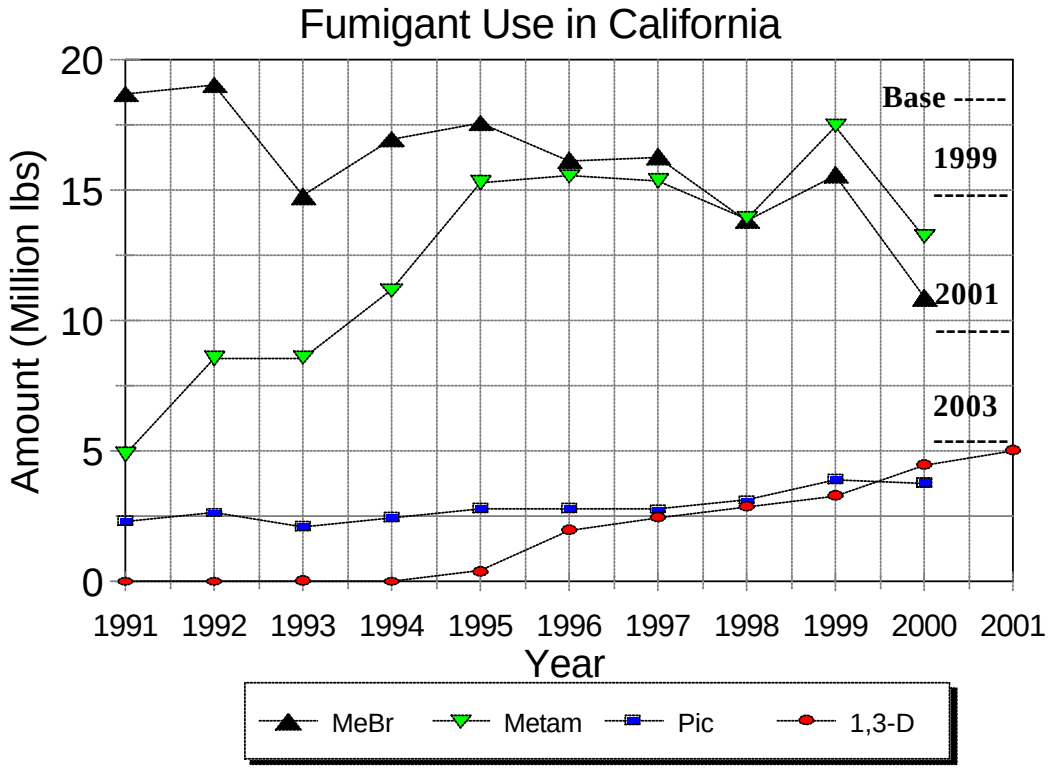
FUMIGANT USE IN CALIFORNIA

Tom Trout
USDA-ARS, Fresno, CA

The Pesticide Use Reporting (PUR) requirements in California allow relatively accurate estimation of the use of fumigants in the state. The PUR database assembled by CA Dept of Pesticide Regulation 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 (Telone®), metam sodium, and chloropicrin.

Use of MeBr has declined gradually since 1991. By 1998, the use was about 75% of the 1991 use. However, 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 for 1999 (shown in Fig.). In 2000, 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 use regulations. In 2001, production/importation was limited to 50% of baseline (1991) levels, or about 1 million pounds below the 2000 level. The reduction will likely be achieved through full or partial substitution of alternative fumigants, and reduced fumigated acreage of some crops. In 2003 the production/importation will be reduced to 30% of 1991 levels, with a total phase out by 2005. Use above these



phaseout levels is allowed for Quarantine and Preshipment. Certified nursery production is currently considered a Quarantine exemption by US EPA. After 2005, certain uses may qualify as Critical Use Exemptions.

About 93% of the MeBr use in California is for preplant soil fumigation, 3% is for structural fumigation, and 3% of use is for post-harvest commodity fumigation. Use of MeBr for structural fumigation has declined dramatically since 1991. The primary crops for which MeBr is used preplant include strawberry (40% of total soil fumigation); a variety of other annual fruits and vegetables including sweet potato, peppers, tomato, melons and lettuce (15%); grapes (10%); fruit and nut trees such as almonds, walnuts, and peaches (9%); nursery crops (12%); and cut flowers (4%). Methyl bromide use on perennial crops decreased by nearly 50% in 2000, probably due to the increased cost of fumigation. Nearly half this decrease was replaced by Telone.

Use of metam sodium increased dramatically from 1991 through 1995 and its total use for soil fumigation surpassed MeBr in 1999. In 2000, although use dropped by 25%, it was still applied to nearly twice as many acres as MeBr and Telone combined. As a low cost fumigant alternative, it has been used mainly on annual vegetable and fruit crops such as carrots, processing tomato and potato.

Since Telone 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 on high value crops that suffer significant nematode damage (carrot, sweet potato, melon, potato, tomato) and for replant of perennial fruit and nut trees. In 2001, drip-irrigation-applied formulations of Telone were registered (Telone II EC and InLine (Telone C-35 EC). These products were used on nearly 2400 ac. of strawberry, pepper, and melon in 2001.

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 "marker" for much methyl bromide use, and as a fungicide for strawberry and some other annual crops in combination with MeBr. It was used as the primary fumigant on only 1100 acres in 2000.

I have assembled the 1996 - 2000 California fumigant data into an ACCESS database. It contains 90,000 individual fumigation records. If you desire additional or more detailed information (for example for certain counties or townships), contact me.

Methyl Bromide and Chloropicrin Use in California - 1996 - 2000 (1000 lbs). (Adapted from Ca DPR PUR Database)

	Methyl Bromide					Chloropicrin				
Commodity	**1996**	**1997**	**1998**	**1999**	**2000**	**1996**	**1997**	**1998**	**1999**	**2000**
Grape	2,068	2,162	1,192	1,628	1,002	10	16	10	11	40
Tree Fruit - Prunus	876	1,209	783	1,084	393	2	7	12	11	34
Citrus	153	164	107	152	118	0	11	0	0	19
Almond	733	1,303	616	468	232	1	2	7	5	13
Nut Trees	626	583	523	650	237	1	1	6	3	30
Bushberry	29	87	39	131	148	16	46	19	73	103
Perennial - other	157	219	132	224	71	2	1	3	9	8
Total Perennial	**4,642**	**5,728**	**3,393**	**4,337**	**2,200**	**33**	**86**	**57**	**112**	**246**
Strawberry	4,666	4,336	4,720	5,659	4,346	2,109	1,994	2,157	2,793	2,430
Sweet Potato	622	770	547	446	360	3	3	5	3	2
Pepper	363	340	406	532	405	43	44	48	67	143
Melons	555	374	499	472	347	0	9	21	71	48
Tomato	341	276	305	423	207	80	83	93	154	112
Carrot	392	149	5	0	18	3	8	26	45	54
Leafy Vegetables	468	436	382	242	259	101	100	122	106	171
Cole crops	60	102	63	57	39	10	5	8	11	28
Vegetable - misc	197	252	295	135	98	73	63	94	69	47
Total Annual Fruit and Veg	**7,665**	**7,034**	**7,222**	**7,967**	**6,078**	**2,422**	**2,310**	**2,575**	**3,320**	**3,035**
Field Crops	140	55	115	39	25	9	5	3	0	4
Nursery - Outdoor	1,785	1,624	1,639	1,717	1,180	225	199	282	250	338
Nursery - Greenhouse	104	78	85	51	40	6	2	5	1	4
Cut Flowers	434	554	450	359	347	49	69	69	126	116
Ornamentals	109	175	160	177	203	1	11	2	3	14
Misc Agriculture	76	32	279	449	330	33	67	132	65	15
Misc Non-Agri	1	4	2	17	0	23	21	1	2	1
Total Soil Fumigation	**14,957**	**15,286**	**13,345**	**15,113**	**10,403**	**2,801**	**2,768**	**3,128**	**3,880**	**3,774**
Post Harvest	107	72	136	148	184	2	2	2	7	4
Structural	3	4	364	316	277	1	1	5	9	2
Total Fumigation	**15,067**	**15,362**	**13,845**	**15,577**	**10,865**	**2,803**	**2,771**	**3,135**	**3,897**	**3,779**

1,3-D (Telone) and Metam Sodium Use in California - 1996 - 2000 (1000 lbs). (Adapted from Ca DPR PUR Database)

	1,3-Dichloropropene					Metam Sodium				
Commodity	**1996**	**1997**	**1998**	**1999**	**2000**	**1996**	**1997**	**1998**	**1999**	**2000**
Grape	62	288	234	346	751	62	58	11	24	54
Tree Fruit - Prunus	276	81	165	207	557	9	1	0	8	10
Citrus	20	34	16	25	74	87	28	13	17	34
Almond	108	63	132	215	252	8	20	7	11	10
Nut Trees	15	26	83	101	97	8	7	1	2	89
Perennial - other	5	18	14	68	83	28	8	7	7	4
Total Perennial	**487**	**511**	**643**	**960**	**1,825**	**202**	**123**	**40**	**70**	**201**
Strawberry	0	15	3	1	17	15	17	142	146	63
Sweet Potato	73	75	278	199	499	314	248	205	358	99
Pepper	72	20	53	55	52	248	252	221	422	507
Melons	100	188	191	171	280	412	678	625	895	483
Tomato	63	43	116	354	178	3,925	3,363	2,859	4,054	2,965
Carrot	731	929	919	865	789	4,603	5,831	5,797	6,571	5,576
Potato	94	264	180	165	236	1,533	1,271	1,202	2,075	1,184
Leafy Vegetables	76	68	94	64	88	924	549	710	361	506
Cole crops	112	134	161	177	101	576	472	258	262	184
Vegetable - misc	58	28	32	47	78	378	577	793	682	516
Total Vegetable	**1,380**	**1,763**	**2,026**	**2,099**	**2,318**	**12,928**	**13,260**	**12,813**	**15,826**	**12,082**
Field Crops	53	39	29	70	80	1,924	1,548	634	886	583
Nursery - Outdoor	36	128	103	81	217	145	133	161	117	87
Nursery - Greenhouse	0	0	0	0	0	0	0	0	2	0
Cut Flowers	0	0	61	6	0	10	17	14	100	116
Ornamentals	1	15	0	0	0	48	113	116	118	38
Misc Agriculture	0	0	20	66	5	71	41	140	0	85
Misc Non-Agri	0	0	10	6	0	0	0	0	315	4
Total Soil Fumigation	**1,957**	**2,457**	**2,891**	**3,288**	**4,445**	**15,328**	**15,234**	**13,916**	**17,433**	**13,196**
Post Harvest	0	0	0	0	1	0	2	1	6	12
Structural	0	0	2	0	0	0	0	0	5	6
Total Fumigation	**1,957**	**2,457**	**2,894**	**3,288**	**4,445**	**15,328**	**15,236**	**13,918**	**17,444**	**13,214**