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SUBJECT: ROTATIONAL FREQUENCY OF FUMIGATION OF FIELDS USED FOR ANNUAL CROPS, MERCED COUNTY, 1995-1999.

This analysis was done to determine an appropriate treatment rotation frequency for modeling 1,3-dichloropropene applications. This applies only to annual crops; permanent crops will be assumed to be treated only once in 20 years. The analysis was based on methyl bromide use because there was very little 1,3-d use from 1994 to 1998. Methyl bromide use after 1999 was not considered, because it began to fall off at that point. It is assumed that 1,3-d will have similar rotational frequency to methyl bromide when used for the same crops.

The townships included are the 3 in Merced County that are the target of 1,3-d township cap discussions, plus the adjacent townships: 05S10E 05S11E 05S12E 05S13E
06S10E 06S11E 06S12E 06S13E
07S10E 07S11E 07S12E 07S13E
08S10E 08S11E 08S12E 08S13E.

I extracted all methyl bromide applications in these townships from the PUR CDs for 1995-1999, for any annual crop that was treated with 1,3-d in these townships in 1999-2001. These crops were: 0152, 0154, 0156 Nursery - outdoor
10008 Watermelon
11005, 29136 Tomato
14018 Sweet potato.

Fields were identified by the combination of growerid (with the year part removed) and siteloc id.

There were 579 fields that were treated in one or more of the 5 years. Thirty to forty percent of them were treated each year. The number of fields treated with methyl bromide in 1, 2, 3, 4 or 5 years is given in Table 1. This table also gives the number of fields having each annual treatment sequence. Table 2 gives the probabilities of treatment in successive years given the treated *vs* not-treated status of a field in any given year.

Table 1. Methyl bromide fumigation frequency and annual treatment sequence of fields used for annual crops in selected Merced County townships, 1995-1999.

N years treated	Treatment Sequence '95	'96	'97	'98	'99	N fields	Percent of fields
1						314	54.2
	X					62	10.7
		X				52	9.0
			X			54	9.3
				X		62	10.7
					X	84	14.5
2						136	23.5
	X	X				25	4.3
	X		X			1	0.2
	X			X		3	0.5
	X				X	1	0.2
		X	X			28	4.8
		X		X		8	1.4
		X			X	2	0.4
			X	X		25	4.3
			X		X	10	1.7
				X	X	33	5.7
3						82	14.2
	X	X	X			22	3.8
	X	X		X		10	1.7
	X	X			X	3	0.5
	X		X	X		6	1.0
	X		X		X	2	0.4
		X	X	X		19	3.3
		X	X		X	3	0.5
			X	X	X	17	2.9
4						37	6.4
	X	X	X	X		18	3.1
	X	X	X		X	1	0.2
	X	X		X	X	1	0.2
	X		X	X	X	5	0.9
		X	X	X	X	12	2.1
5	X	X	X	X	X	10	1.7

Table 2. Probability that a field was treated with methyl bromide in successive years: fields used for annual crops in selected Merced County townships, 1995-1999.

Year	Treatment status	N fields	Subsequent year	Probability of treatment
1995	Not treated	409	1996	0.303
			1997	0.411
			1998	0.430
			1999	0.394
	Treated	170	1996	0.529
			1997	0.382
			1998	0.312
			1999	0.135
1996	Not treated	365	1997	0.329
			1998	0.414
			1999	0.416
	Treated	214	1997	0.528
			1998	0.364
			1999	0.150
1997	Not treated	346	1998	0.338
			1999	0.358
	Treated	233	1998	0.481
			1999	0.258
1998	Not treated	350	1999	0.303
	Treated	229	1999	0.341

This analysis probably underestimates the number of treatments per field for two reasons. First, because of inconsistent entry of siteloc id, the same field may appear to be two or more different fields in different years. Second, this analysis did not count multiple treatments to a field within the same calendar year.

cc: Joseph Frank