



Department of Pesticide Regulation




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MEMORANDUM

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DATE: September 4, 1998

SUBJECT: MONITORING RESULTS FROM A TARPED, VIRTUALLY
IMPERMEABLE FILM, SHALLOW INJECTION METHYL
BROMIDE APPLICATION IN ORANGE COUNTY

Introduction—Methyl bromide is widely used as a preplant soil fumigant for control of nematodes, fungi, diseases, and weeds. The Department of Pesticide Regulation (DPR) and county agricultural commissioners have implemented permit conditions, including buffer zones, to mitigate unacceptable methyl bromide exposure (greater than 0.21 parts per million; 24-hour time-weighted average).

The Virtually Impermeable Film (VIF) in laboratory studies has shown reduced permeability to methyl bromide compared to high density polyethylene (high barrier) films ¹. Additional monitoring was conducted to test and evaluate the VIF's effectiveness of reducing concentration of methyl bromide 30 feet from the fields edge compared to the high barrier tarpaulin.

Materials and Methods—The field monitored was treated with methyl bromide by a shallow broadcast tarped application method on May 2, 1998. In this method the methyl bromide is injected into the soil at a depth of 12 inches and immediately

Douglas Y. Okumura
September 4, 1998
Page 2

covered with the VIF tarp with the application rig. The field was treated in 11-foot wide strips, one edge glued to the preceding strip the other edge buried in the soil. The field was located in the city of Seal Beach.

The application site consisted of a 738 feet x 668 feet (11.3-acre) portion of a larger field. The application rate was 353 pounds per acre of formulated product, 67 percent methyl bromide 33 percent chloropicrin. The application took approximately 6-1/2 hours.

Ambient air samples were collected at 32 locations for the first 48 hours, and 16 locations for the subsequent 24 hours, using charcoal tubes and SKC air samplers. Samplers were located at 30 and 60 feet from the treatment edge. Table 1 and Figures 1 & 2 indicate the position of each sampler. Samples were collected for seven sampling periods beginning with start of fumigation at 06:08. Samples were collected for two 6-hour followed by five 12-hour periods, for a total of 72 hours.

The weather was cloudy/overcast with rain during sampling period 5 and light drizzle during sampling period 7. Temperatures ranged from 58 to 68 degrees Fahrenheit. The wind was generally from the southwest at 5 to 10 miles per hour 45 percent of the time, and 0 to 5, and 10 to 22 miles per hour for 33, and 22 percent of the time respectively.

Results—Air concentrations ranged from no detectable amount to 0.18 parts per million (24-hour time weighted average) at sampler 8, a 30 foot sampler. The highest concentration at 60 feet was 0.16 parts per million at sampler 24. Air concentrations were higher than expected. Previous DPR monitoring of a shallow tarped broadcast application with the high barrier tarpaulin (Greater permeability than the VIF tarpaulin) found similar maximum concentrations of 0.187 and 0.135 ppm at 30 and 70 feet respectively².

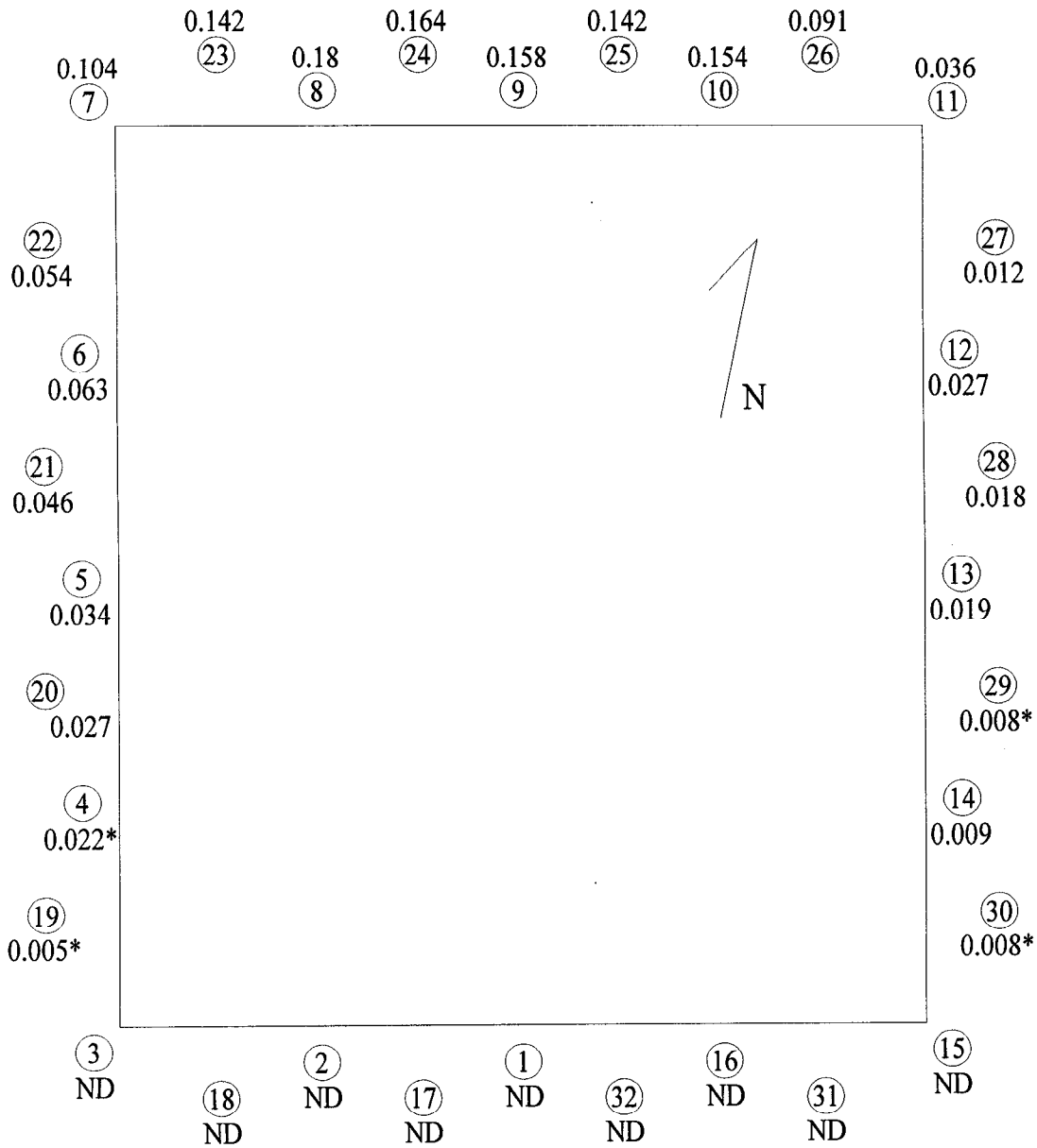
If you have any questions please call me.

Attachment

¹ TRICAL Research and Bolsa Research, COMPARISON OF FLUX RATE BETWEEN DOW HBF AND EU2 FILMS, DRAFT REPORT #3. October 30, 1997.

² Wofford, Pamela L. and Randy Segawa, MONITORING RESULTS FROM A SHALLOW TARPED BROADCAST APPLICATION IN MONTEREY COUNTY - METHOD 4/5, Memorandum to Douglas Y. Okumura, Environmental Monitoring and Pest Management Branch, Department of Pesticide Regulation, Sacramento California. March 20,1998.

Figure 1. The application site, sampling sites for intervals 1 to 5, and the 24-hour average concentration* for intervals 3 & 4 (parts per million).

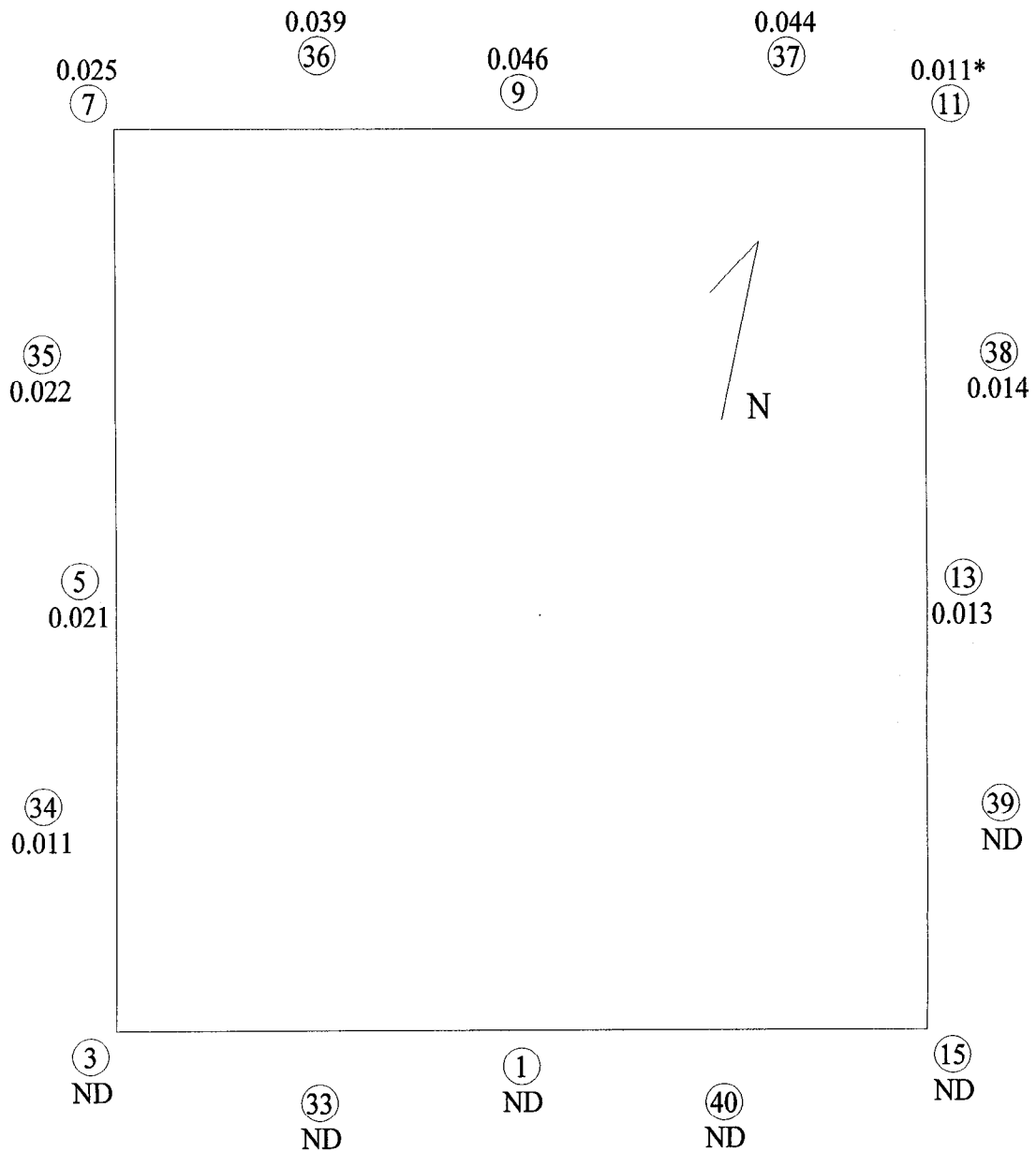


Sites 1-16 are approximately 30 feet from edge of field.

Sites 17-32 are approximately 60 feet from edge of field.

* Includes periods of no detectable amount, 1/2 the detection limit (0.0025) was used to obtain the 24 -hour average.

Figure 2. The application site, sampling sites for intervals 6 and 7, and the 24-hour average concentration *(parts per million).



Sites 1-15 are approximately 30 feet from edge of field.

Sites 33-40 are approximately 60 feet from edge of field.

* Includes periods of no detectable amount, ½ the detection limit (0.0025) was used to obtain the 24 -hour average.

Table 1. Ambient methyl bromide air concentrations 5/2-5/4/1998.

Sampler			Methyl Bromide (ppm) for each Sampling Period					Max ¹ 24-hr Peak ¹ (24 hrs)
			6:00 - 12:00 (6 hrs)	1200 - 18:00 (6 hrs)	18:00 - 6:00 (12 hrs)	6:00 - 18:00 (12 hrs)	18:00 - 6:00 (12 hrs)	
Site	Direction	Distance (ft)						
1	south	37	ND ^a	ND	ND ^b	ND	0.020	ND
2	south	36	ND	ND	ND	ND	0.013	ND
3	southwest	31	ND	ND	ND	ND	0.012	ND
4	west	30	ND	ND	0.042	ND	0.026	0.022*
5	west	30	ND	ND	0.053	0.015	0.025	0.034
6	west	37	ND	ND	0.104	0.022	0.020	0.063
7	northwest	37	ND	ND	0.176	0.031	0.059	0.104
8	north	30	ND	0.097	0.275	0.085	0.063	0.180
9	north	30	0.038	0.104	0.224	0.091	0.066	0.158
10	north	30	0.064	0.123	0.198	0.110	0.021	0.154
11	northeast	30	0.031	0.120	0.028	0.045	0.018	0.036
12	east	30	0.029	0.090	0.021	0.033	0.015	0.027
13	east	33	0.020	0.060	0.015	0.024	0.010	0.019
14	east	34	ND	0.024	0.007	0.011	ND	0.009
15	southeast	38	0.016	ND	ND	ND	0.015	ND
16	south	37	ND	ND	ND	ND	0.016	ND
17	south	67	ND	ND	ND	ND	0.015	ND
18	south	65	ND	ND	ND	ND	0.017	ND
19	west	60	ND	ND	0.008	ND	0.023	0.005*
20	west	62	ND	ND	0.048	0.006	0.023	0.027
21	west	66	ND	ND	0.077	0.016	0.020	0.046
22	west	67	ND	ND	0.086	0.021	0.043	0.054
23	north	60	ND	0.063	0.211	0.072	0.063	0.142
24	north	60	0.011	0.133	0.213	0.115	0.055	0.164
25	north	60	0.028	0.121	0.197	0.088	0.049	0.142
26	north	60	0.039	0.174	0.101	0.082	0.013	0.091
27	east	61	0.048	0.074	0.016	0.009	0.014	0.012
28	east	62	0.017	0.044	0.012	0.024	0.008	0.018
29	east	64	0.015	0.020	ND	0.015	0.005	0.008*
30	east	64	ND	ND	ND	0.014	0.008	0.008*
31	south	67	ND	ND	ND	ND	0.015	ND
32	south	67	ND	ND	ND	ND	ND	ND

¹ the peak 24-hour time-weighted average is derived from the concentrations in bold, only complete periods were used in this calculation.

* indicates that the 24-hour average includes a period of no detectable amount where ½ the detection limit was used to obtain the 24-hour average.

ND = No detectable amount; ^areporting limit =0.010 ppm, ^breporting limit =0.005 ppm

Table 2. Ambient methyl bromide air concentrations 5/4 - 5/5/1998.

Sampler Location			Methyl Bromide (ppm) for each Sampling Period		
			6:00 - 18:00 (12 hrs)	18:00 - 6:00 (12 hrs)	24-hr Peak ¹ (24 hrs)
Site	Direction	Distance			
1		37	ND	ND	ND
3		31	ND	ND	ND
5		30	.021	.021	.021
7		37	.024	.026	.025
9		30	.052	.039	.046
11		30	.020	ND	.011*
13		33	.012	.014	.013
15		38	ND	ND	ND
33		60	ND	ND	ND
34		60	.012	.011	.011
35		60	.024	.020	.022
36		60	.046	.033	.039
37		60	.052	.036	.044
38		60	.011	.016	.014
39		60	ND	ND	ND
40		60	ND	ND	ND

* indicates that the 24-hour average includes a period of no detectable amount where 1/2 the detection limit was used to obtain the 24-hour average.

ND = No detectable amount, reporting limit = 0.005 ppm