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# Department of Pesticide Regulation

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## MEMORANDUM

TO: Thomas Thongsinthusak, Staff Toxicologist **HSM- 98006**

FROM: David Haskell, Associate Environmental Research Scientist  
[Original signed by David Haskell]

DATE: August 24, 1998

SUBJECT: RESPONSE TO DPR REQUEST FOR ADDITIONAL  
INFORMATION REGARDING FREQUENCY AND DURATION OF METHYL  
BROMIDE FUMIGATIONS

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Selected custom applicators and agricultural commodity associations were recently contacted by letter and asked to review the attached memo regarding methyl bromide commodity fumigation (Sanders, 1998). This memo estimates the duration of the workday exposure (hours per day) for workers applying methyl bromide or working with fumigated commodities and the annual frequency these workday exposures occur (Haskell, 1998). The custom applicators and commodity associations were asked to comment on the accuracy of the information in the memo in regard to the use by their industry and to provide additional information if possible. This information will be used in the methyl bromide exposure assessment to estimate the duration of the workday exposure for applicators and the frequency that acute, subchronic and chronic exposure occurs. Two commodity fumigators and one custom methyl bromide applicator have responded to the letter with additional information. Their responses are discussed in the following appendixes.

Appendix A: Frequency and Duration of Workday Exposure to Methyl Bromide for Applicators Making Commodity Fumigations

Appendix B: Frequency of Workday Exposure for Applicators Treating Soil with Methyl Bromide

## Appendix A: Frequency and Duration of Workday Exposure to Methyl Bromide for Applicators Making Commodity Fumigations

### I. VALLEY FIG GROWERS

The Valley Fig Growers association has responded with additional methyl bromide use information. The response includes a three year summary (95-97 use seasons) of their commodity fumigations for dried figs. The information indicates that some errors are present in the initial report of their use derived from the 1997 pesticide use reports. The initial estimate made by DPR for the number of annual workdays methyl bromide is applied to figs by an employee of Valley Fig Growers was 120 days. And the assumption was made that one worker made all the fumigations. However, the current data submission indicates that three workers make the applications during the peak season and two during the slow season. The revised estimate of the number of annual workdays methyl bromide is applied per worker is 62-85. The following table summarizes the use for the 1995-1997 seasons.

Table I. Number of Annual Days Methyl Bromide Is Applied to Figs and the Peak Application Season

Treatment Month	Lbs. of Methyl Bromide Applied and (number of applications)			Peak 90 Day Work Season +(application days per worker)*	No. of Annual Application Days + (annual application days per worker)**
	1995	1996	1997		
January	232 (7)	120 (5)	418 (14)	August-Oct. or Sept.- Nov. (23, 28, 28)	153, 156, 200 (62, 67, 85)
February	208 (6)	264 (9)	352 (12)		
March	344 (11)	72 (3)	208 (8)		
April	520 (12)	272 (10)	224 (8)		
May	260 (6)	96 (4)	248 (9)		
June	386 (12)	200 (7)	432 (16)		
July	186 (6)	218 (8)	576 (20)		
August	708 (21)	482 (15)	840 (25)		
September	880 (23)	1090 (29)	896 (28)		
October	884 (25)	1252 (34)	1016 (31)		
November	600 (18)	700 (22)	512 (18)		
December	312 (9)	232 (7)	264 (11)		
Monthly Ave.	460 (13)	417 (13)	499 (17)		

\* Application days per worker was estimated by dividing the total number of methyl bromide applications made during the peak season for each year by the number of workers available (3) to make the application.

\*\*The number of annual application days was calculated as the sum for each month for the year. The annual application days per worker for each year was estimated by dividing the number of peak season applications by three and the slow season applications by two and then summing the two values.

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A second major point made in the information submission by Valley Fig Growers is that the worker making the chamber application of methyl bromide is not involved in the aeration process. The assumption was made in the methyl bromide commodities memo that the applicator would also initiate the aeration of the treated commodity. For this company, the aeration process takes place automatically and worker would only be involved in checking the methyl bromide levels inside the chamber after the aeration process. Additional information is also provided on the time needed to make the application and to check the methyl bromide levels in the chamber after aeration. This change in job duties of the applicator and estimated work times indicate the work exposure time listed in the department memo should be reduced from one hour to approximately one half hour per application for Valley Fig Growers.

## II. SUNSWEET GROWERS INC.

The information submission by Sunsweet Growers Inc. concerns the number of annual fumigations and the length of the workday exposure for the applicator. Sunsweet Growers Inc. operates only one chamber to fumigate dried prunes at their facility in Yuba City. The typical treatment lasts for 24 hours followed by a minimum of 24 hours of aeration. The aeration process is initiated through an automatic process and the person checking methyl bromide levels in commodities after aeration is usually not the same person who made the application. A maximum of three treatments are made per week. For the 1997 use season, a total of 46 applications were made with the greatest number occurring during October (13 applications). The next two busiest months averaged six applications each. Five workers are certified to make the applications.

The submission also discusses the length of the workday for workers applying methyl bromide or checking/aerating fumigated commodities. In the methyl bromide commodities memo, one hour of exposure per workday was listed assuming the same worker make the application and performed the aeration/checking of the fumigated commodity. These activities resulted in 1-1.5 hours of exposure per fumigation. However, Sunsweet indicates that the application time or time to aerate and check methyl bromide levels in treated prunes is usually less than half an hour each. These two work tasks are rarely performed by the same worker. The average and maximum hours of exposure per

workday per worker in Table I of Appendix C of the methyl bromide commodities memo should be reduced to 0.5 hours for chamber fumigations of dried prunes. The following table reflects the changes in the estimated frequency of workday exposure for workers based on information submitted by Sunsweet Growers Inc.

Table II. The Number of Peak Season and Annual Exposure Days for Workers Performing Chamber Fumigations of Dried Prunes with Methyl Bromide

Treatment Month	Lbs. of Methyl Bromide Applied	Peak Season Workdays per Week	Peak 90 Day Work Season + (application days per worker)*	No. of Annual Application Days + (annual application days per worker)**
December 96	300	3	August-October	46
January 97	75		(10)	(18)
February 97	150			
March 97	75			
April 97	300			
May 97	150			
June 97	75			
July 97	450			
August 97	300			
September 97	450			
October 97	900			
November 97	225			
Monthly Ave.	288			

\* Application days per worker was estimated by dividing the total number of methyl bromide applications made during the peak season by the number of workers available (5) to make the applications. The value was then doubled to account for the days each worker performed the aeration/commodity checking activities.

\*\* Application days per worker was estimated by dividing the total number of methyl bromide applications made during the 1997 season by the number of workers available (5) to make the applications. The value was then doubled to account for the days each worker performed the aeration/commodity checking activities.

## **Appendix B: Frequency of Workday Exposure for Applicators Treating Soil with Methyl Bromide**

### I. TRICAL COMPANY

The TRICAL Company initially responded to a request for methyl bromide application information in 1992 in conjunction with the exposure assessment for methyl bromide. This submission included only application information for the two busiest applicators (drivers) from each of the four districts in the company. The information was itemized with the following parameters: the type of application (non-tarp and tarp), the lbs. of methyl bromide applied per acre, the acres treated per month, and the average fumigation time per month. Workday capacities were described in terms of acres treated per workday with or without tarps at various application rates. The average workday was itemized in terms of the time spent to perform the various work tasks associated with applying methyl bromide with a ground rig. The workday capacity was expressed in acres fumigated per hour. This information was used to derive the values in Tables I and II of Appendix D of the methyl bromide commodities memo.

The current submission is more comprehensive with methyl bromide application information for all applicators employed full time by the company. These workers may apply methyl bromide and/or Telone and also help to move and maintain the application equipment. The average workday was itemized in terms of the time spent to perform the various work tasks associated with applying methyl bromide with a ground rig. Depending on the application method (tarp or non-tarp), the author estimated the actual application time ranged from 5.5-6.0 hours for a 9.5 hour workday. The workday capacity was expressed as acres fumigated per hour for tarped and non-tarped fumigations. The acres treated per workday can then be calculated for each driver as the product of acres treated per hour and the hours of application time per workday. The company documents the number of acres per month fumigated with methyl bromide by each driver. These monthly totals of acres treated were divided by the average number of acres treated per workday to estimate the number of workdays per month each driver handles methyl bromide. These values were derived with the assumption that on every workday, the average number of acres were fumigated. Partial workdays caused by breakdowns, wet fields and wind were added together to make one average workday. The

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application data was presented as a series of tables itemizing the number of days each driver applied methyl bromide per month from May 97-April 98. A final table summarizes the number of workdays each worker applied methyl bromide for the year.

The author has included a comparison of the various parameters in the two reports to illustrate the changes that have occurred in the industry from 1992 to 1997. From this comparison, several observations can be made. The total acres fumigated with methyl bromide by TRICAL decreased 12% from 1992 to 1997. More workers are now employed with less acres being fumigated per driver per year. The average number of annual acres treated by each driver has dropped by approximately 25%. The percentage of the total acres fumigated with a tarp have increased and the percentage of acres treated without a tarp have decreased. Kirk Fowler indicated in a recent phone conversation that the number of acres treated annually with Telone has increased significantly over the last few years and now accounts for 1/3 of the total acres fumigated by the company. This fact accounts for the observation that some drivers made zero methyl bromide applications in the 97-98 application season. The company indicated this decrease in fumigation activity with methyl bromide was due to permit conditions and buffer zones that limit the number of acres that can be treated in a workday and the increase in the acres treated with Telone.

The information in the tables can be used to derive estimates on the frequency that workday exposures may occur. During the busiest month, the drivers as a whole average 14 fumigation days per month with a few drivers reaching 20 + days per month. This indicates that during the peak season some drivers can work 5-6 days per week. During the three busiest months, the drivers averaged 27 fumigation days. Fifty-three percent of these drivers averaged 40 application days (range 30-67 days ) for the period. On an annual basis, all the drivers averaged 44 fumigation days per year. When the seven drivers that applied methyl bromide less than five days for the year are not included, the average increases to 51 fumigation days. The maximum number of fumigation days for an individual driver was 96.

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### **References**

Haskell, D 1998. Methyl bromide fumigation of various commodities. Department of Pesticide Regulation (DPR), Worker Health and Safety (WH&S) Branch. Memo to Thomas Thongsinthusak dated August 18<sup>th</sup>.

Sanders, J. 1998. Methyl bromide risk assessment-request for work task data. DPR, WH&S Branch. Letter to selected methyl bromide fumigators dated June 19<sup>th</sup>.