

## THE POSTHARVEST RESPONSE OF 'HASS' AVOCADO TO METHYL BROMIDE FUMIGATION

M. L. Arpaia, S. L. Ontai, and S.R. Reints, Jr.  
Department of Botany and Plant Sciences,  
University of California, Riverside  
L.G. Houck and P. L. Hartsell  
USD A-ARS, Fresno, California

For the last two years we have evaluated the response of 'Hass' avocado to methyl bromide fumigation for fruit fly disinfestation. We provided a progress report for the project at the last meeting of W-164. Results from that first year indicated that methyl bromide fumigation at any time after harvest resulted in greater chilling injury following 4 weeks of storage at 5 C. There was also greater weight loss and decay. Fruit fumigated during this first year exhibited no external damage due to fumigation.

During 1991-92 we expanded the project. This year we used a constant level of methyl bromide ( $32 \text{ g-m}^3$  for 4 hours at 30 C) within 24 hours of harvest but examined the impact of aeration time. In the first year a constant 4 hour aeration treatment was utilized. This year we compared 2.5 hours aeration versus 5 hours aeration at the fumigation temperature (30 C). We also collected residue data from the fruit following fumigation and after storage at 5 C for either 2 or 4 weeks. To compare fumigation to a 'non-chemical' treatment we are compared the fumigated fruit to fruit which have been stored at 1 C for 2 weeks (similar to the APHIS cold treatment protocol for Mediterranean fruit fly). Following storage, 10 fruit were evaluated for flesh firmness and external appearance. An additional 15 fruit were held at 20C for ripening. Following ripening the following data was collected on an individual fruit basis: weight loss, ease of peeling (1-4), external appearance (0-5), vascular (1-4) or flesh (0-5) discoloration, flesh firmness, time to eating ripeness (<1.5 1bf) and the presence or absence of decay. Any fruit that had a score of 3 or greater for ease of peeling, or discoloration was termed moderate or severely damaged.

Table 1 summarizes the key observations during the second year of testing. We observed some surface cold damage on the fruit following this treatment, but since the "Hass<sup>1</sup> darkens with ripening naturally we initially thought that the impact of this type of damage would be limited. Note that fumigated fruit, however, had significantly higher amounts of moderate to severe surface pitting at the time of ripeness. In terms of internal cold damage, there appeared be less chilling injury in fruit held at 1 C as compared to that which had been fumigated. We have not finished the data analysis from the second year. We plan to prepare the results from both years for publication.

Table 1. The effect of either methyl bromide fumigation or cold treatment on the postharvest quality of 'Hass' avocado after 4 weeks storage.

Treatment <sup>z</sup>	Methyl Bromide (+/-)	Aeration Time (hrs)	Weeks at 1C	Weeks at 5C	Weight Loss (%)	Peel Mod/Sev (%)	External Mod/Sev (%)	Internal Mod/Sev (%)
1	-	-	0	4	6.05	2.5	5.0	1.7
2	-	2.5	0	4	6.25	5.8	10.8	3.3
3	-	5.0	0	4	6.75	9.2	11.7	4.2
4	+	2.5	0	4	7.34	15.0	40.8	20.8
5	+	5.0	0	4	8.10	16.7	39.2	23.3
6	-	-	2	2	5.48	10.8	15.8	3.3
7	-	-	4	0	5.51	8.3	13.3	0.8
					0.001	0.001	0.001	0.001

*Significance*

<sup>z</sup> Treatments 2 and 3 were held at 30C (86F) for 4 hours plus the specified aeration time and serve as controls for the methyl bromide treatments. Treatments 4 and 5 were fumigated at 30C for 4 hours at 32 g·m<sup>3</sup> then aerated for either 2 or 4 hours.

