

Interactive comment on “Seasonal cycles of biogenic volatile organic compound fluxes and concentrations in a California citrus orchard” by S. Fares et al.

S. Fares et al.

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General comments This manuscript by Fares et al. reports measurements of biogenic VOC fluxes and mixing ratios from an orange tree orchard in California. The dataset, taken for almost a year, provides very good information about the seasonal differences in VOC emissions from the plantation, and combines a broad range of different measurements (fluxes, mixing ratio gradients, GC-MS speciation, leaf VOC content and cuticle wax composition) to characterize the orchard's VOC physiology and emission. This paper fits into the scope of ACP and I recommend its publication after addressing the following minor points, which complement those already raised by referee #1.

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>We want to thank referee 2 for providing a critical review and for offering an interesting discussion argument, like e.g. the possibility that a compensation point exists in the canopy for certain compounds. In the new version of the manuscript we prepared, the referee suggestions have been discussed.

Specific comments P18000, L9-10: The gradient you refer to is in summer/morning? Can you be more concise?

>we clarified in the text to which season/hours of the day the gradient refers.

Fig. 2: Have the authors observed a compensation point (i.e. an ambient concentration above which these OVOCs are deposited/absorbed by the Citrus trees) for methanol, acetaldehyde, or acetone? For example at night, or when urban polluted air was advected to the orchard. There is no mention to this in the text, however OVOCs have been found to be taken up or emitted depending on the inside/outside leaf concentration gradient (e.g. Karl et al. 2005; Seco et al. 2007; Jardine et al. 2008).

>We thank the author for mentioning this important consideration. We indeed observed a transition period from early night to late night in which the canopy acted as a source and then as a sink for OVOC, acetone in particular. A compensation point in the night time may exist for acetone concentration of around 3.5 ppb. We discuss this phenomenon in the paper, highlighting wet surfaces in the early morning as a relevant deposition sink. We also cite the relevant articles which the reviewer provided.

Table 1: Should “69 Isoprene” be bold?

>Thanks for noticing this. m/z 69 was indeed in bold in the file I provided, but this editing was lost during the article processing. I will make sure this distinction will remain.

Figs. 1 and 4: As indicated by Referee #1, showing the periods (flowering, summer, winter) in these figures will help the reader.

>The Day of the Year (DOY) of flowering, summer and winter seasons are now reported in the text and in the figure legend.

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Fig. 4: Please indicate in the caption whether bars denote standard error, deviation...

>The bars indicate standard deviation from the mean. This is now indicated in the legend.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 17987, 2012.

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