markers) and other fertilizers (purple markers) is captured. Also the decrease of volatilization with increasing irrigation in the measurements of Holcomb et al. (2011), is reproduced, although the simulated volatilization is underestimated in the lightly irrigated treatments with the measured volatilization losses up to 60%.

Finally, Fig. 5 compares the simulated volatilization losses with observations for surface-applied slurry. In panel a, the model was run with a constant application rate of 50 m$^3$ ha$^{-1}$ and infiltration time ($\tau_{\text{infl}}$ for S0, Section 2.4.3) $\tau_{\text{infl}} = 12$ h, which are the default values chosen for the global simulations. In this configuration, the model captures the average volatilization losses, which are higher than for urea or pastures, but the observations of Spirig et al. (2010) and Sintermann et al. (2011) are strongly overestimated, and the model is not significantly correlated with observations ($R = 0.27$, $p = 0.19$). The modest agreement with the observations suggests that a significant fraction of the variation might not be related to the variations in ambient conditions.

The experiments of Spirig et al. (2010) and Sintermann et al. (2011) were carried out using mixtures of cattle and swine slurries with DM contents mostly between 1 and 3%, while the other studies include slurries with up to 12% DM. Similarly, the application rate varied from 30 m$^3$ ha$^{-1}$ up to 100 m$^3$ ha$^{-1}$ (3–10 mm) in the various studies. While the application rate is