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194-1 Lysimetric Evaluation of Eddy Covariance Fluxes Over Irrigated Cotton In the Texas High Plains.

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Henry Gonzalez Convention Center, Room 007C, River Level

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Water use efficiency of different cropping systems is of high interest to agricultural community in arid and semi-arid regions such as Texas High Plains. In these regions, irrigation is extensively used to supplement generally inadequate growing season rainfall to meet crop water demand. Although large precision weighing lysimeters are considered as standard for crop water use measurements, these systems are expensive to build and maintain. Alternatively, Eddy Covariance systems are being used to measure crop water use. However, due to numerous explicit and implicit assumptions in the EC method, an energy balance closure problem exists. Therefore, the objectives of our study were to quantify energy balance closure and evaluate flux measurement biases over irrigated cotton (*Gossypium hirsutum*) in the Texas High Plains. For this purpose, an EC system was installed near a large weighing lysimeter at the center of a 2.4 ha field in the USDA-ARS Conservation Production Research Laboratory, Bushland, Texas. Continuous flux measurements were made at 20 Hz during June-July 2010. Collected raw high frequency data were despiked and detrended before determining sensible and latent heat fluxes, and compared against lysimeter data to quantify the energy balance closure. Efforts were also made to determine relationships between size of the bias and concurrent atmospheric conditions in relation to crop growth stages. In this presentation, we will discuss the preliminary findings of this study.

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