



## **Evaluating water-saving efficiency of plastic mulching in Northwest China using remote sensing and SEBAL**

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Plastic mulching of agricultural land surfaces has been widely used to cope with growing water shortage, but little research has been done in evaluating its water-saving efficiency at large catchment scale. We evaluate the effectiveness of water use in plastic mulching in a large catchment in Northwest China using remote sensing data and the Surface Energy Balance Algorithm for Land (SEBAL). We use a decision-tree method to delineate the plastic mulching lands (PML) from other croplands (NPML) based on land surface albedo and temperature derived from Landsat images. We use SEBAL and Moderate-resolution Imaging Spectroradiometer (MODIS) data to estimate evapotranspiration (ET) and the water use in PML and NPML. Our study shows that ET from the PML reduced about 6.6% compared with NPML, and the area of PML increased about 84.2% during the 14-year period of 2000–2013 in the catchment. However, the total water use in the area still increased 50.0% as the total cropland area increased about 48.6% in the same period. Our study therefore suggests that the best water management strategy in arid China needs not only to increase water use efficiency but also to control total water usage by limiting reclamation of farmlands.