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Evapotranspiration estimation in pastures at the municipality of Campo Grande, Brazil, using SEBAL and remote sensing data

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The knowledge of the total water loss by evapotranspiration is essential for plant growth and development assessments. Studies show that the success of the Brazilian livestock is directly linked to the fact that bovine cattle is reared in pastures, which enables low cost beef production. However, many factors influence the productive capacity of pastures and, consequently, beef production. Among these, there are variations in precipitation, causing periods of water deficit even during rainy seasons, which makes evapotranspiration a major factor in the diagnosis of climatic and environmental conditions of pasture areas. Remote sensing information has been used by several models and algorithms for obtaining parameters of the Earth's surface. The Surface Energy Balance Algorithms for Land (SEBAL) is an algorithm for evapotranspiration estimation for large areas. It is processed by means of computational steps, which predict a full assessment of the solar radiation and energy on the Earth's surface. For that it uses data of sensors that collect wavelengths in the visible, reflective infrared and thermal bands. This study aimed at estimating actual daily evapotranspiration (ETdaily) in pasture areas at Embrapa Beef Cattle's Experimental Farm, located in the municipality of Campo Grande, Brazil, by means of the SEBAL algorithm and Landsat 5-TM images. For the scenes of May 9, June 28, July 7 and October 2, 2009, the ETdaily varied from 0.50 to 3.50 mm/day with an average of 1.85 mm/day for pasture areas. The application of the SEBAL algorithm proved itself adequate in extensive areas, and it is possible to use it for monitoring pasture conditions, thus contributing to making decisions that favor beef cattle production with environmental sustainability.