



Critical moments for irrigation

Mikhail Smilovic and Hester Biemans

IIASA, Laxenburg, Austria (smilovic@iiasa.ac.at)

Irrigation supports and increases agricultural production in regions that might otherwise be too water limiting. In addition, it buffers unpredictable weather patterns and climatic variability. However, the benefits of irrigation may vary depending on the amount and timing of applications, as well as between growing seasons. When water resources are limited, irrigation should be applied as to maximize “crop per drop”, namely irrigation water productivity. However, the timings and amounts of irrigation that are most benefitting are difficult to determine within the growing season itself and relate to several variables, including growth stage, available soil moisture, and temperature. We determine the most critical moments to irrigate across India retrospectively from 1979-2009 for major crop types, and work to determine a patterning that can support decision making for supplemental irrigation practices. We employ the LPJmL model and Crop Kite methodology to determine crop-production functions at 0.5-degree scale and derive from these the season-specific optimal timings for irrigation applications.