

# Seasonal fog alleviates drought stress of rubber trees in Xishuangbanna

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Rubber plantation in Xishuangbanna. Credit: XTBG

The importance of fog in forest ecosystems has been recognized and

debated for centuries. However, the extent to which the leaves of rubber plants can maintain net CO<sub>2</sub> assimilation in the fog season is not known.

In a study published in the *Journal of Hydrology*, researchers from the Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences analyzed carbon/water flux data during 2014–2016 in a mature rubber plantation in Xishuangbanna.

They compared the net ecosystem CO<sub>2</sub> exchange, gross primary production, canopy evapotranspiration, crop water productivity, canopy conductance and transpiration rate under foggy and non-foggy days of cool dry (November-February) and hot dry (March-April) seasons to reveal the impact of fog on these carbon and water processes.

The analysis of three years of continuous observation showed that fog occurred during 42% of the total study period, and the majority occurred during the dry season when the temperature was relatively low. The dense foggy days did not affect gross primary production, but decreased canopy evapotranspiration.

In addition to the [low temperature](#), fog events were also associated with low vapor pressure deficit, atmospheric water potential, [relative humidity](#) and frequent wet-canopy conditions. Statistical analysis demonstrated that physiological parameters were mainly regulated by the concomitant changes of air temperature and vapor pressure deficit during cool dry foggy days.

The study suggests that low fog occurrence would cause greater dry season demand for groundwater in [rubber plantations](#) and decrease ecosystem crop water productivity.

"Our study highlights that during foggy days, the rubber plantation utilizes less water and thus increases the crop water productivity.

Therefore, the rubber farmers should implement canopy evapotranspiration -based adaptive irrigation management systems for better yield, particularly during the [dry season](#) of the non-foggy season," said Zhang Yiping of XTBG.

**More information:** Palingamoorthy Gnanamoorthy et al, Seasonal fog enhances crop water productivity in a tropical rubber plantation, *Journal of Hydrology* (2022). [DOI: 10.1016/j.jhydrol.2022.128016](https://doi.org/10.1016/j.jhydrol.2022.128016)

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