

# TROPICAL FORESTS CAN'T COPE WITH HEAT

**Do tropical forests grow faster if there is more CO<sub>2</sub> in the air? Not all trees, and especially not if it is hot, according to a WUR study.**

WUR professor of Tropical Forest Ecology Pieter Zuidema and his colleagues analysed 5318 tree rings of 129 Australian cedars (*Toona ciliata*) in four different locations in Australia and South-East Asia. The tree rings were an archive on growth between 1950 and 2014. During that time, the CO<sub>2</sub> in the atmosphere increased by a quarter. The measurements clearly show that the trees are sensitive to climate change. The growth per tree varied a lot between years. But all trees showed the same pattern: they grew fast in good years but not in poor years. According to Zuidema, the variation means statistics can be used to disentangle the effects of increasing CO<sub>2</sub>, precipitation and temperature. With some surprising conclusions.

## PHOTOSYNTHESIS

The fertilization effect of CO<sub>2</sub> does exist but only in cooler areas (averaging

20°C). In those areas, warm years lead to more efficient photosynthesis and so more growth.

Also, the trees are less sensitive to drought stress as they make more efficient use of the available water. But that CO<sub>2</sub> bonus doesn't work in warmer areas (averaging 25°C). In fact, growth declines there in hot, dry years.

According to Zuidema, that is because the leaves become so warm in those hot years that photosynthesis is inhibited. Zuidema's striking conclusion: 'Tropical forests can't cope well with heat. We see a change in the climate sensitivity of tropical forests as a result of the increasing amount of CO<sub>2</sub> in the air.' He hastens to add that this has only been demonstrated for this one species of tree. **GRK**

