New research into the water-saving properties of pineapples could have crossover benefits for a range of food crops, according to a Texas A&M AgriLife Research Center study.

An international team of scientists from the Dallas-based center sequenced the pineapple genome, unlocking information about the fruit's drought tolerance and the way it converts light to energy.

Team leader Yu Qingyi says the significance of the study could be 'enormous', with implications for fruits and vegetables as well as commodity crops like rice and wheat.

The majority of crop plants use C3 or C4 photosynthesis while pineapples use a type of photosynthesis called crassulacean acid metabolism (CAM). In plants using CAM, the stomata in the leaves remain shut during the day to reduce evapotranspiration and open at night to collect carbon dioxide (CO2).

"Pineapples are the second most important fruit after bananas, contributing to more than 20% of the world's production of tropical fruits," Yu tells *www.freshfruitportal.com*.

"Pineapples are the most important agriculturally used crassulacean acid metabolism plant (CAM) plant. Plants that use CAM can use 20-80% less water to produce similar amounts of biomass compared with C4 and C3 plants, respectively.

High water use efficiency and drought tolerance thus make CAM an attractive pathway for engineering crop plants that can hold up to the challenges of climate change.

During the research, Yu identified genes involved in the CAM photosynthesis, investigated the diel (a 24-hour period) expression patterns of CAM, and identified regulatory elements of CAM.

"Our efforts produced the first detailed analysis of the expression and regulation patterns associated with CAM. These are patterns that could ultimately be used to engineer CAM metabolism in other crops.

"CAMs water use efficiency and drought tolerance are especially attractive in the face of our changing climate.

"The most important trait is the plant's CAM photosynthesis and carbon assimilation pathways that result in its high water use efficiency. This is a highly desirable trait given the need to double food production by 2050 under the changing climate."

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