

Leaves nature's most sophisticated environment sensors

New research confirmed that leaves are nature's most sophisticated environment sensors. We can therefore use leaves to tell us about the management of the land they are growing in.

Professor of Zoology, Yvonne Buckley, at Trinity College Dublin is part of a global network of grassland ecologists who have found that critical plant nutrients such as nitrogen, phosphorus and potassium in leaves respond to fertilization treatments as well as the climate and soils they are growing in.

The discovery has just been published in *Nature Ecology & Evolution*, phys.org wrote.



phys.org

While ecologists and agricultural scientists have known for some time that individual species at individual locations can vary in the amounts of these nutrients in their leaves in response to fertilization, this is the first time that it has been confirmed across entire communities of plants in very different climates and soil conditions. The experiment was undertaken at 27 sites in four continents, from the semiarid grasslands and savannas of Australia to lush pastures in Europe and prairies in America.

When plants are fertilized they can use those extra nutrients to grow bigger and produce more flowers and

seeds which can dilute the nutrients in their leaves, so a positive response of leaf nutrients to fertilization is not guaranteed. A surprising result of this experiment was that Specific Leaf Area, a leaf trait that is commonly used to tell us about how plants defend themselves against herbivores and capture sunlight for growth, was unaffected by fertilization. So this critical measure of leaf architecture is not changing in a consistent way in response to fertilization.

Leaf architecture is instead determined by climate and soil characteristics, so it may respond over a longer time frame than short-term fertilization. Commenting on the significance of the research, Buckley said, "As our environment changes more quickly due to climate change, intensification of agriculture and land use, it is becoming more important to understand how grasslands all over the world are likely to respond. Grasslands are one of the most extensive habitats in the world, they provide us with food, carbon storage and habitat for pollinators. Using plants as sensors of environmental change gives us another important tool for understanding the consequences of these changes for our life support systems."

"There are two ways that leaf nutrients can change in grassland communities, either the existing species leaves change to store more nutrients or the kinds of species which can survive in these new conditions change to species that naturally have higher leaf nutrients. We found that for nitrogen and potassium both of these things were happening but for phosphorus the species change pathway was not important."

1,200-year-old Bible seized in southeastern Turkey's Diyarbakir



hurriyetdailynews.com

Turkish security forces seized a Bible said to be 1,200 years old in southeastern Turkey's Diyarbakir Province.

According to the Diyarbakir governor's office, local gendarmerie received intel that someone was looking to sell an ancient Bible manuscript written on leather with gold-encrusted motifs, dailysabah.com wrote.

Suspects were caught red-handed while trying to sell the 34-page manuscript.

Security forces said six people were detained in connection with the incident.

Diyarbakir is located near the Turkish border with Syria. It is not known if the Bible was smuggled from the country, but Turkey has become a primary destination for those smuggling antiquities from Syria.

Authorities have stepped up efforts to prevent the smuggling and sale of smuggled artifacts. The government has issued a list of artifacts believed to

be stolen from Syria and warned customs agents, collectors and others against their sale.

Thousands of anti-smuggling operations are carried across Turkey every year to halt the illegal sale of historical objects and protect the country's rich cultural heritage.

The issue is crucial to a country that is home to about 3,000 ancient cities from 42 civilizations, and whose tourism industry relies on its rich historical heritage to attract millions of foreigners each year.

Endangered parrots exported from Australia

A government MP said it 'beggars belief' that more endangered Australian birds have been exported to a German organization headed by a convicted kidnapper and extortionist, after a Guardian investigation revealed there had been multiple warnings that the birds could be sold to collectors at a huge profit.

Warren Entsch repeated calls for an independent investigation into how the Association for the Conservation of Threatened Parrots (ACTP) was able to receive hundreds of rare and endangered birds from Australia, after its founder, Martin Guth, used a social media post to say more endangered species had arrived at its facilities in January, theguardian.com wrote.

Labor's environment spokesman, Tony Burke, called on the environment minister, Melissa Price, to explain the 'bizarre' case and the Greens urged an immediate suspension of any further shipments.

A six-month Guardian investigation revealed in December that the environment department had approved the transfer of more than 200 birds to ACTP over three years on the grounds they would be used for a zoo exhibition.

But the organization has no facilities that are freely open to the public, and private messages on social media show native Australian birds apparently from ACTP have been offered for sale for hundreds of thousands of dollars. The German federal agency for nature conservation has said it was aware of those offers.

In a post on his personal Facebook page in late January, Guth said two more 'very rare and amazing species' had arrived from Australia.

The species are the Baudin's black cockatoo, which is

nationally listed as a vulnerable species and requires a special agreement between the government, exporter and importer, and a subspecies of the sulphur-crested cockatoo, which Guth's post claimed had never been outside of Australia.

"I know I should not post it, just to not make all the haters happy!" the post said.

"But I love birds like we all do!"

It continued, "I was waiting long time to get those species in!"

Australia's environment department issued a permit in November for the export of 64 more birds to ACTP. The permit included Baudin's black cockatoos and sulphur-crested cockatoos, Naretha bluebonnets and endangered Carnaby's black cockatoos.

Guardian Australia asked the department if it had considered canceling the permit and was told it was still valid.

A spokeswoman said the department had received formal notification in December that 34 of the birds had shipped to Germany, including two endangered Carnaby's black cockatoos, six yellow-tailed black cockatoos and five Macleay's fig parrots.

She said the department was reviewing information about ACTP "to assess if an investigation is warranted under the En-



theguardian.com

vironment Protection and Biodiversity Conservation Act 1999". In late December Guth told the German regional TV broadcaster RBB that ACTP had no restrictions on its dealings in Australian birds.

"It means we are allowed to offer them ... and we are allowed to sell Australian birds," a translation of the interview said.

The export permits issued by the Australian department, along with correspondence between the department, ACTP

and Germany's federal agency for nature conservation, state the birds and their offspring were not to be sold. But the German agency has since said there were no limits on trade as far as it was concerned.

Entsch said, "It beggars belief, in light of what has been revealed, that the department would continue to facilitate these shipments."

"It brings into question the integrity of the approval process," he said.

"The minister needs to step up and take control of their department and ask serious questions."

"I will not let it go. There needs to be a full independent audit of every bird that has ever been exported."

Burke said, "If the government has been allowing our threatened species to become part of an international profit-making game then it has to stop, and stop now."

He added, "The more I learn about this story, the more bizarre it seems. If this has been a legal process then the law needs to change. If the law hasn't been applied properly, then the minister needs to explain."

The Greens' environment spokeswoman, Sarah Hanson-Young, said the permits should not have been issued.

"The environment department has some serious questions to answer," she said.

"I will be using estimates hearings in two weeks to probe how on earth this happened and what the department and the minister are going to do to fix it."

"The federal government should never have given permits to allow the trade of rare and endangered birds with a person convicted of fraud and kidnapping. It must be investigated."

Chinese hunger for 'world's smelliest fruit' threatens Malaysian forests

Soaring demand for durians in China is being blamed for a new wave of deforestation in Malaysia with environmentalists warning vast amounts of jungle is being cleared to make way for massive plantations of the spiky, pungent fruit.

Grown across tropical Southeast Asia, the durian is hailed as the 'king of fruits' by fans, who liken its creamy texture and intense aroma to blue cheese, channelnewsasia.com wrote.

But detractors say durians stink of sewage. The strong smell means many hotels across the region have banned guests from bringing them to rooms, while Singapore does not allow the fruit on its subway system. Nevertheless, they are a hit in China, and the increase in demand has prompted exporters to vie for a bigger share of the burgeoning market.

Growers in Malaysia are increasingly

shifting from small orchards to industrial-scale operations — a trend that environmentalists warn presents a new threat to rainforests already challenged by loggers and palm oil plantations.

"Right now durians are gaining a lot of attention from the Chinese market," said Sophie Tann, from environmental protection group PEKA, which has studied land clearances to make way for the fruit.

"This deforestation for planting of durians is in preparation to meet that demand."

In the jungle-clad district of Raub in central Malaysia, swathes of rainforest have recently been chopped down to make way for a new plantation, with durian seedlings protected by netting planted across bare hillsides.

The plantation is next to an area of protected forest, which is home to a kaleidoscope of animals from monkeys to exotic birds.

A river, now murky and filled with trunks



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and branches from logging, runs close by.

A sign outside the plantation said it was run by Ample Harvest Produce but company staff refused to comment when contacted about the loss of trees in the area.

PEKA said the land's status was changed by

the local government to allow logging, but local authorities did not respond to requests for comment.

In a Beijing mall about 4,000 kilometers away, a stall named 'Little Fruit Captain' is doing a brisk trade selling Malaysian durians.

Shop manager Wang Tao said his customers 'fall in love' with durians from Malaysia due to their particularly sweet taste, often preferring them to those from rival exporters, such as Thailand.

He imports frozen durians from a facility in Malaysia and sells them in plastic containers or in other forms — a kind of baked dessert, in ice cream or fried up as crisps.

Customers are kept up to date about the shop's stock via the WeChat messaging app.

"I first tried durian as a child and acquired a taste for it," said university student Liu Zelin, who visits the shop once a week for her

durian fix.

"Thai durians have a stronger flavor and you tend to get sick of it after a while, but not the ones that I buy from here."

The most popular variety — and one of the most expensive — is Musang King, known for its thick, golden flesh. A single Musang King was on sale at the Beijing stall for ¥800 (\$120), several times more expensive than in Malaysia.

"Our customers aren't concerned about the prices, they just want the best," said Wang.

With the price of key Malaysian export palm oil, used in everyday goods around the world from soap to margarine, in a seemingly inexorable decline, farmers are increasingly turning to durians.

The country's government has backed the expansion of the industry, hoping to cash in on growing demand from the world's second-biggest economy.