

THE STRAITS TIMES

NUS team creates SmartFarm that uses new gel to tap water in the air

Tech utilises large, untapped source of fresh water: moisture in the atmosphere



A research team led by Assistant Professor Tan Swee Ching (left) from NUS' Department of Materials Science and Engineering has created SmartFarm - a self-contained farming system which uses a new hydrogel as its main technology. The team members are (from right) Dr Zhang Xueping, Ms Yang Jiachen and Mr Qu Hao. So far, the NUS team has successfully grown kangkong in its prototype SmartFarm. PHOTO: NATIONAL UNIVERSITY OF SINGAPORE



Ng Wei Kai

PUBLISHED APR 14, 2021, 5:00 AM SGT

Imagine being able to grow your plants with moisture from the air rather than from a tap.

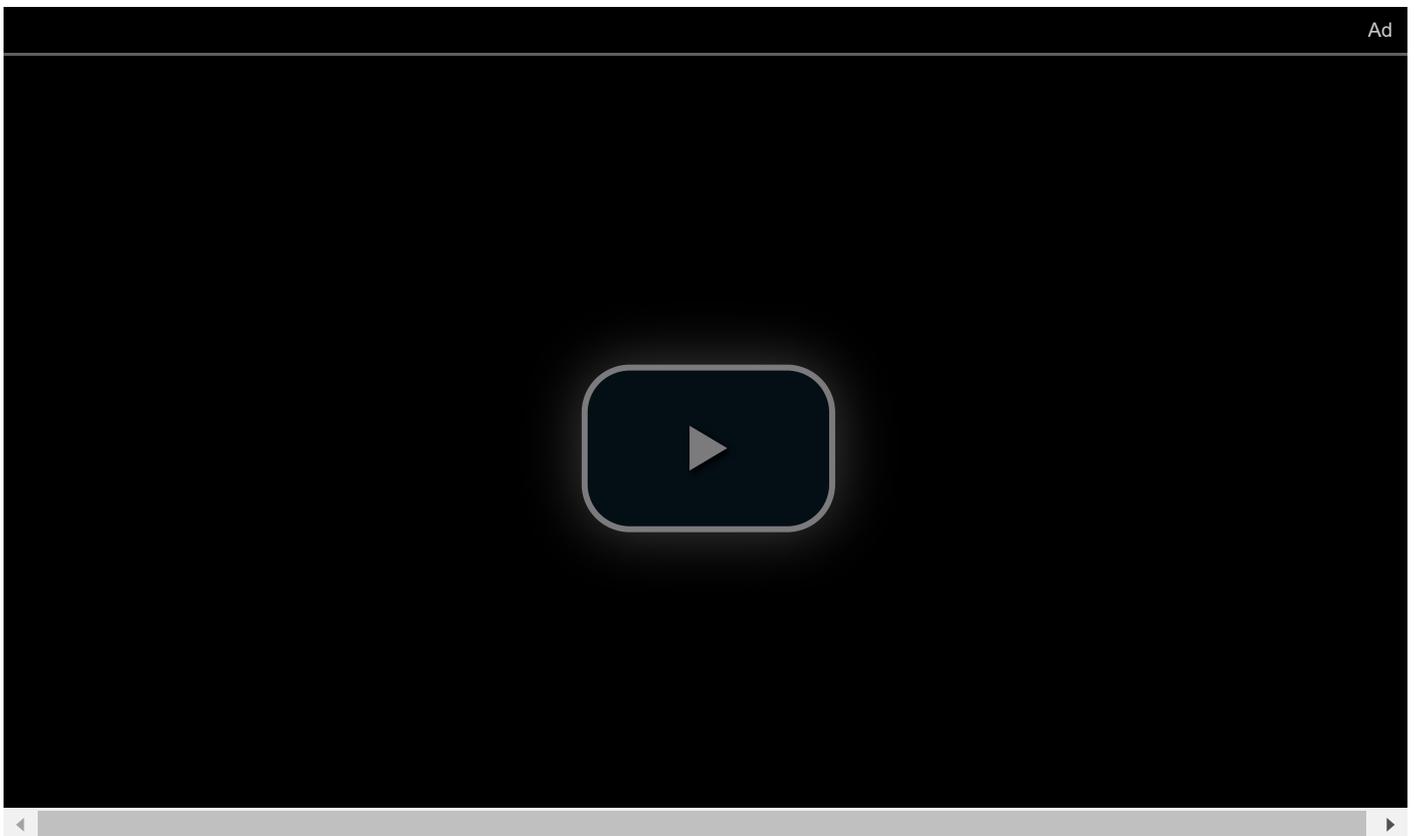
Researchers from the National University of Singapore (NUS) have created a prototype device known as a SmartFarm - a self-contained farming system which uses a new hydrogel as its main technology.

The solar-powered, fully automated SmartFarm looks like a large fish tank. At night, the top cover opens to allow the hydrogel to trap moisture in the air.

After sunrise, at a pre-set time, the top cover closes to confine the water vapour, forcing it to condense on the surface of the enclosure. This is then wiped off the surface and onto the soil to irrigate the plants.

So far, the NUS team has successfully grown kangkong in its prototype SmartFarm.

Researchers say the technology is aimed at utilising a large, untapped source of fresh water - moisture in the air - which could address two of the world's biggest problems: water scarcity and food shortages.

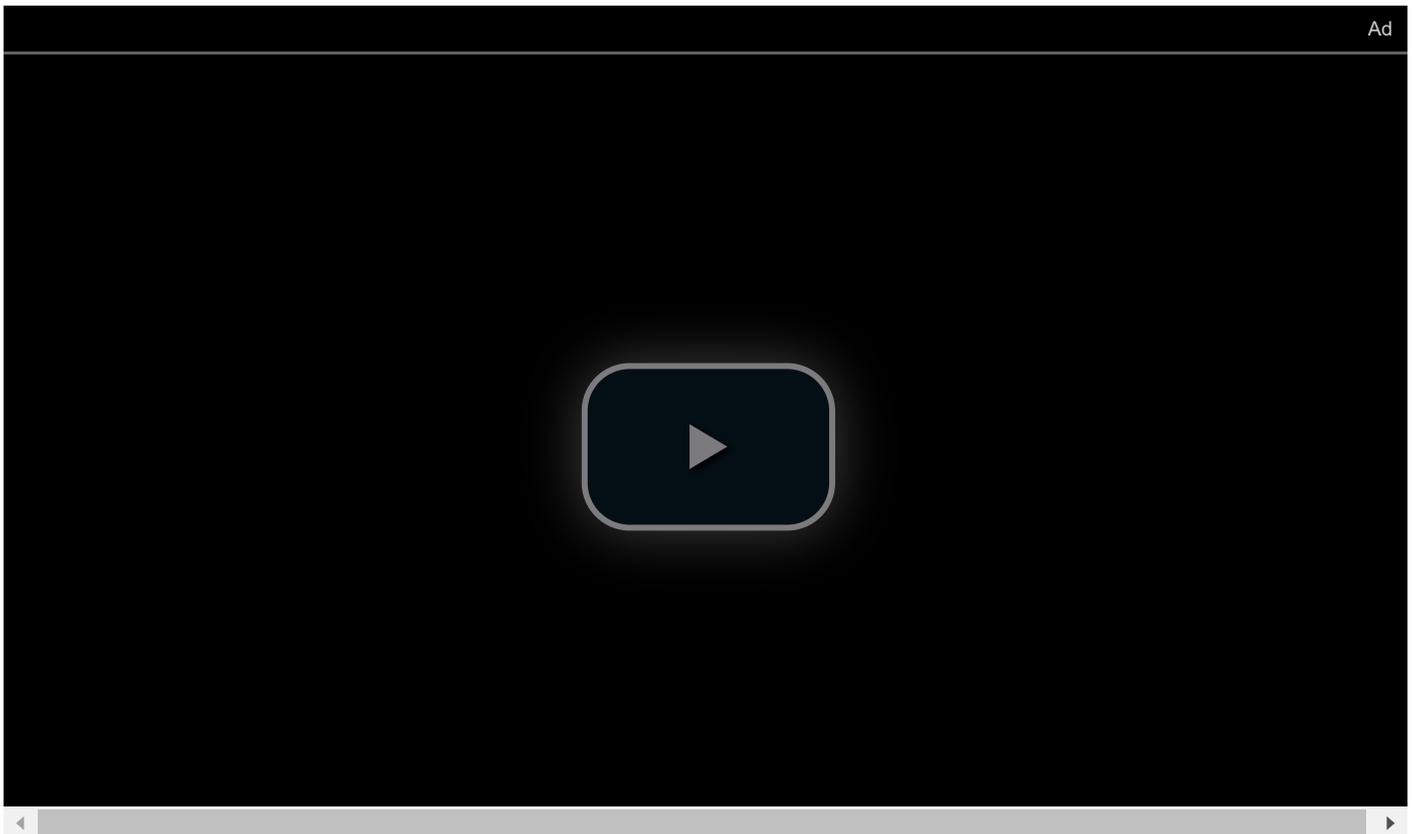


"Atmospheric humidity is a huge source of fresh water but it has remained relatively unexplored," said SmartFarm's project leader, Assistant Professor Tan Swee Ching, from NUS' Department of Materials Science and Engineering.

He added that Singapore's humidity levels - which are usually well over 80 per cent - are uniquely suited for the hydrogel technology.

Prof Tan, who spent many years working and studying in more temperate climates, initially began work on hydrogels to solve a different problem: Singapore's often uncomfortable heat.

"A lot of the heat we experience is actually due to Singapore's humidity. It is so humid that moisture - our perspiration - cannot evaporate off our skin, which is how we usually lose heat," he said.



The copper-based gel, which researchers began work on in late 2019, is non-toxic and is extremely absorbent, capable of holding up to 300 per cent or three times of its own weight in water.

By comparison, current commercially used drying materials like silica gels can hold only up to 30 per cent of their own weight in water.

\$20

Cost to make a kilogram of the new hydrogel. The researchers expect the cost to fall when demand rises.

A kilogram of the new gel costs about \$20 to make but the researchers expect the cost to fall when demand rises.

The NUS team is currently in talks with industry partners to explore commercialisation options.

The hydrogel's applications stretch far beyond farming.

It has been used to simulate farming at the Hawaii Space Exploration Analog and Simulation, a habitat created for human spaceflight to Mars.

The hydrogel was also used to control humidity in small experimental greenhouses to grow and sustain crops in Selene II, a simulated Moon mission from November to December last year.

Join ST's Telegram channel here and get the latest breaking news delivered to you.

RECOMMENDED



Australia's vaccine roll-out setbacks take shine off its Covid-19...

Apr 16, 2021



6-year-old taken to hospital unconscious after car...

Apr 16, 2021



An SUTD student shares how she's blown away by Finland

SUTD



[Pics] Canal Drained For First Time And They Find This...

<http://articlesmansion.c...>



Domino's Signature Top Secret Sauce Pizzas Now with Limited...

Domino's Pizza Singapo...



The future of engineering and architecture – where AI and...

Branded Content



You're Overpaying For Your Phone Bill: Here's 130GB for \$18

tpgmobile.sg



Shorter Microsoft Teams meetings and a brand new...

Branded Content



sponsored by **DBS**

Unsecured Loans. Find the right one for you.

Pick me for **immediate cash access** in emergencies

CASHLINE

Cashline - 0.06% interest per day

[Learn More](#)

Pick me for **fixed repayments** over a few years

PERSONAL LOAN

Personal Loan - Get low interest rates

[Learn More](#)

I'm a flexible, **short-term solution** to manage your finance

BALANCE TRANSFER

Balance Transfer - At 0% interes

[Learn More](#)



Subscribe today

Get unlimited access to exclusive stories and analyses by the ST newsroom

Choose your plan

 E-paper

 Facebook

 Instagram

 Twitter

 Podcasts

 RSS Feed

 Telegram

 Youtube

- SINGAPORE
- ASIA
- WORLD
- OPINION
- LIFE
- BUSINESS

- TECH
- SPORT
- VIDEOS
- PODCASTS
- MULTIMEDIA

[Terms & Conditions](#)

[Data Protection Policy](#)

[Need help? Reach us here.](#)

[Advertise with us](#)

Sign up for our daily newsletter

More [newsletters](#)

By registering, you agree to our T&C and Privacy Policy.

SPH Digital News / Copyright © 2021 Singapore Press Holdings Ltd. Co. Regn. No. 198402868E. All rights reserved