



Faça parte da
maior escola
online de
tecnologia do
Brasil

Saiba

Alura

ABOUT ▾

RESEARCH ▾

BLOGS ▾

VIDEOS ▾

STEM EDUCATION ▾

BOOKSTORE

SWAG SHOP

DONATE

VOLUNTEER

SUBSCRIBE



Ecology New Technologies



BIOTECH & DIGITAL AGRICULTURE: THE SMART FARMING REVOLUTION

MARCH 29, 2023

SCIENCE CONNECTED

AGRICULTURE, BIOTECH, DIGITAL, GMO,
MONITORING, SENSORS



Digital agriculture uses emerging technologies—including sensors, drones, and artificial intelligence—to collect crop data that can be used to enhance agricultural outcomes.

BY GABRIELLE LEAL

Still relatively unknown to the general public, digital agriculture is becoming increasingly important in the global agriculture sector. This novel approach aims to improve farm and crop management by maximizing efficiency and increasing productivity through the use of cutting-edge technologies. Sensors, drones, artificial intelligence, and automation are among the technologies used to monitor soil conditions, climate, irrigation, and other variables critical to successful agricultural production.

MORE DATA MAKES BETTER FARMING

Digital agriculture technologies have the potential to significantly alter current agricultural practices. Digital agriculture is an interdisciplinary approach that includes knowledge from engineering, information technology, agronomy, and, of course, biotechnology. Although they may require a steep learning curve, digital agriculture's tools can greatly aid in production when used properly.

Information and communication technology developments have enabled greater system integration and real-time data collection, allowing for more precise and efficient decision-making. Sensors, drones, and other tools allow farmers to continuously monitor [soil](#), water, and weather conditions, as well as plant growth.

BECOME A SUPPORTER

If each person reading Science Connected Magazine donated just \$1 a year, all of our not-for-profit programs would be fully funded.

Monthly

One Time

\$25

\$50

\$100

\$250

\$

USD

♥ Dedicate This Gift

Donate with

[or choose another payment method](#)

Get Your Free
Weekly Digest

SUBSCRIBE

Producers can now obtain accurate and detailed information about growing conditions in real time, allowing them to make more informed decisions about when to plant, water, and fertilize their crops. By monitoring soil and water conditions, farmers can adjust the amount of nutrients and water provided to plants based on the plants’ specific needs; this practice helps to reduce waste, save money, and increase plant productivity.

Loja Online Natura

Corretivo Cobertura Extrema 24h Medio 22 Una - 8ml

Additionally, data collection helps farmers identify problems at an early stage, allowing them to take corrective action before challenges become larger. Another advantage of data collection is the capacity to foresee changes in weather and soil conditions in advance, which helps farmers take preventive actions to avoid losses and limit hazards connected with inclement weather.

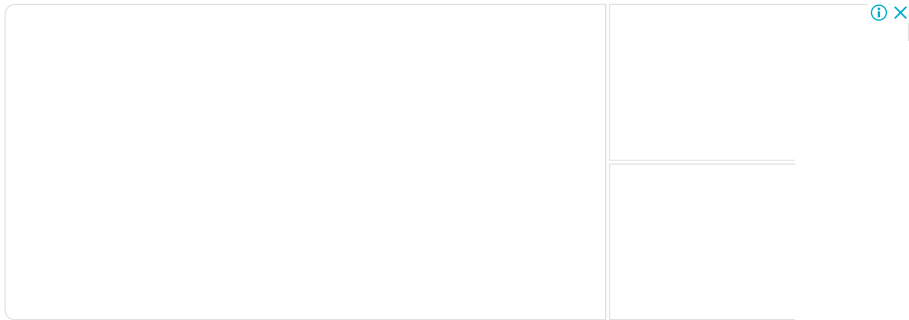
Digital agriculture and biotechnology have a lot in common and complement one another well. Producers may develop more adaptable crops with larger yields in less time by combining these two tools. Biotechnology enables the development of plants that are more resistant to climate change and disease, whereas digital agriculture enables farmers to monitor and manage their crops more precisely and efficiently.

Digital agriculture can be an incredible resource in the production of genetically modified organisms (GMOs), allowing farmers to monitor and control plants in real time. It is possible to evaluate plant performance, identify potential problems, and take corrective action more promptly. Furthermore, digital agriculture enables GMO monitoring, assisting farmers in meeting government laws and guaranteeing that their crops are safe and of high quality. Real-time data collection also helps to improve GMO production efficiency and productivity by allowing farmers to utilize fewer inputs and resources while increasing output.

To summarize, digital agriculture is an innovative strategy that provides enhanced [agricultural productivity and efficiency](#). Sensors, drones, and other equipment capture data in real time, allowing farmers to make more precise decisions. When combined with biotechnology, digital agriculture encourages the development of crops that are more resilient, adaptive, efficient, and productive.

REFERENCES

Clapp, J., & Ruder, S. L. (2020). Precision technologies for agriculture: Digital farming, gene-edited crops, and the politics of sustainability. *Global Environmental Politics*, 20(3), 49-69.

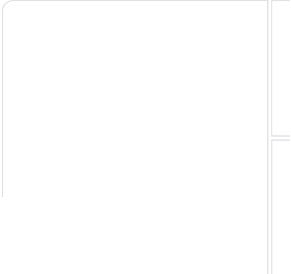


Mês do Consumidor
Natura Online

DÖRR, Jörg; NACHTMANN, Matthias. **Handbook Digital Farming**. 2022.

Husby, J. (2007). Definitions of GMO/LMO and modern biotechnology. *Biosafety First: Holistic Approaches to Risk and Uncertainty in Genetic Engineering and Genetically Modified Organisms*, 569-581.

Sarker, M. N. I., Islam, M. S., Murmu, H., & Rozario, E. (2020). Role of big data on digital farming. *International Journal of Scientific & Technology Research*, 9(4), 1222-1225.



a Online Natura
ira

T: ENVIRONMENT



WATER QUALITY
MONITORING BY
BACTERIAL BIOSENSORS

MARCH 20, 2023

SCIENCE CONNECTED

BACTERIA, HEAVY
METALS, WATER
CONTAMINATION, WATER
POLLUTION, WATER TESTING



BACTERIA HAS NATURAL
CAPACITY TO RECYCLE
PLASTICS

MARCH 10, 2023

SCIENCE CONNECTED

BACTERIA, PLASTIC
POLLUTION, RECYCLING



SUNLIGHT POWERS
RECYCLING OF CARBON
DIOXIDE AND PLASTIC

FEBRUARY 15, 2023

SCIENCE CONNECTED

BIOFUEL, CARBON
DIOXIDE, PLASTIC
POLLUTION, RECYCLING,
SOLAR POWER

HOW BROWN ALGAE
MUCUS COMBATS CARBON
DIOXIDE

FEBRUARY 10, 2023

SCIENCE CONNECTED

ALGAE, CARBON
DIOXIDE, CARBON FIXING,
CLIMATE CHANGE,
SEAWATER

BIOENERGY SORGHUM:
THE GREEN CROP OF THE
FUTURE

FEBRUARY 8, 2023

SCIENCE CONNECTED

AGRICULTURE,
ENVIRONMENTAL
PROTECTION, GREEN
ENERGY, SOIL HEALTH

HUMAN MIGRATION
TRENDS TOWARD
WILDFIRE HOT SPOTS

JANUARY 27, 2023

SCIENCE CONNECTED

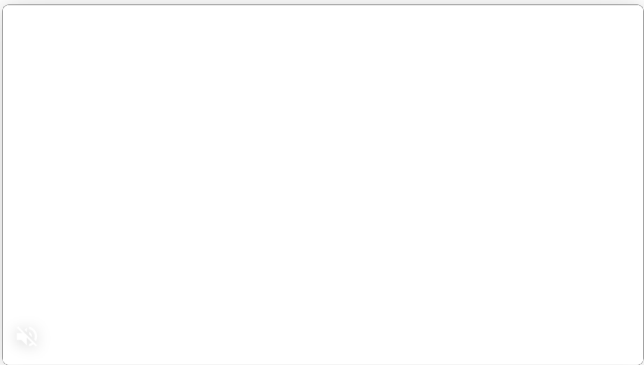
CLIMATE CHANGE,
EXTREME WEATHER, HEAT
WAVE, HEAT WAVES,
MIGRATION, WILDFIRES

Shang, L., Heckelei, T., Gerullis, M. K., Börner, J., & Rasch, S. (2021). Adoption and diffusion of digital farming technologies-integrating farm-level evidence and system interaction. *Agricultural systems*, 190, 103074.

Parekh, S. R. (Ed.). (2004). *The GMO handbook: genetically modified animals, microbes, and plants in biotechnology*. Springer Science & Business Media.

ABOUT THE AUTHOR

Biotechnologist Gabrielle Leal has over ten years of lab experience and a master’s degree in the field. Microbiology, industrial bioprocesses, and intellectual property are among her areas of expertise. She is fascinated by the research and advancement of biotechnological approaches for various applications.



a Online Natura
ira

« How Children Learn Language

How the Placebo Effect “Tricks” the Brain »

RECOMMENDED FOR YOU

Botany Climate
Change Environment

Biology Botany Sustainable
Living

Botany Climate Change

BIOENERGY SORGHUM:
THE GREEN CROP OF THE
FUTURE

📅 FEBRUARY 8, 2023
👤 SCIENCE CONNECTED
| 🌱 AGRICULTURE,
ENVIRONMENTAL
PROTECTION, GREEN
ENERGY, SOIL HEALTH
Bioenergy sorghum
hybrids can restore
carbon levels in soil,
improve soil fertility,
provide biomass for
biofuel...

HIDDEN HELPERS:
BACTERIA IN LEAVES

📅 NOVEMBER 16,
2022
👤 SCIENCE CONNECTED
| 🌱 AGRICULTURE,
BACTERIA, FERTILIZERS,
PLANTS
New research shows
that bacteria found
inside plant leaves
can transfer their
nitrogen and might
eliminate...

ETHANOL MAY HELP
CROPS SURVIVE
DROUGHTS

📅 SEPTEMBER 21,
2022
👤 SCIENCE CONNECTED
| 🌱 AGRICULTURE,
BIOCHEMISTRY, BOTANY,
CLIMATE CHANGE,
DROUGHT
Droughts can wreak
havoc on food supply
and crop production,
but a new study
shows that...



Science Connected Magazine is an editorially independent, non-profit newsroom producing open-access science journalism and scientific fact-checking for the global public. We work to increase science literacy and public access to reliable information. We are published by

- Contact
- Terms of Use
- Privacy Policy
- Style Guide

Science Connected, a registered 501(c)(3) ScienceConnected.Org
nonprofit organization headquartered in
San Francisco, California. Science
Connected does not endorse products or
services. Advertising revenue helps to
support our programs.