

## Indonesia's BRIN developing green biopesticides to drive sustainable horticulture

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Indonesia's National Research and Innovation Agency (BRIN) is developing eco-friendly biopesticides to support the growth of sustainable horticulture in the country.

"Since using synthetic pesticides pollutes the soil, spoils beneficial organisms, and disrupts the ecosystem as a whole, we are in need of environmentally friendly solutions," Head of BRIN's Food and Agricultural Research Organization Puji Lestari stated.

Lestari said the agency had placed focus on research aimed at inventing natural pesticides using plants, microbes, and minerals. Lestari expressed hope that the efforts invested by BRIN would help Indonesia promote sustainable cultivation of vegetables, fruits, and decorative plants on over 110 million hectares of existing horticultural land.

Meanwhile, Rasiska Tarigan, a researcher at BRIN's Center for Horticultural Research, emphasized the importance of using microbes, such as bacteria, fungi, and protozoa, as materials for making biopesticides.

"Microbes living around plant roots can help improve soil structure, provide nutrients, and protect plants from pests," she explained.

Tarigan stated that fungi and bacteria, as antagonistic microbes, can also be used as effective biofungicides and bioinsecticides. She said bioinsecticides, made from entomopathogenic microbes, can effectively safeguard plants from invasive insects without leaving chemical residues.

"Rhizosphere microorganisms, or microbes living around plant roots, can also play a role in the absorption of essential nutrients, such as nitrogen and iron, while supporting photosynthetic processes," she added.

Bearing all that in mind, the researcher emphasized that BRIN would continue making efforts to develop microbe-based products to help the government provide domestic farmers with solutions to pests and plant diseases.

"We hope that our research will result in products effective for dealing with plant diseases caused by different factors, including climate change, across the country," she remarked.