



# Plant-to-Plant Warning Signals

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## Why in News?

Recently, scientists have unveiled pivotal insights into **how plants perceive and respond to danger signals from neighboring plants.**

- **This discovery offers potential avenues for leveraging plant communication** to enhance agricultural pest control without resorting to [pesticides](#).

## How do Plants Warn Each Other of Danger?

- **Plant Communication and Coordination:** Plants are **not passive organisms that merely react to their environment.** They can communicate with each other and coordinate their responses to various threats.
  - They possess the **ability to intercept damage happening to other nearby plants.**
  - By mounting a defense response, **plants can make themselves less palatable or even indigestible** to the insect attackers.
- **Green Leaf Volatiles as Signaling Agents:** One of the ways that plants communicate is by **releasing and sensing airborne chemicals** called **Green leaf volatiles (GLVs).**
  - **GLVs**, emitted by plants when injured, **create the pleasant smell of fresh cut grass for humans.** However, to neighboring plants, **this scent functions as a warning signal, indicating potential danger.**
  - It is mediated by [calcium](#), a **common mediator of chemical and electrical signals** found throughout biology.
    - When insects nibble on plant leaves, calcium ions flood the cells, prompting them to **emit a glow.**
- **Response of Mutant Mustard Plant to GLVs:** Scientists recently **experimented mutant mustard plant**, designed to check if it could also react to GLVs.
  - When exposed to **air laden with GLVs, the plant exhibited a glowing response under the microscope**, signifying its ability to sense volatile components released by damaged plants.

## How Plant Communication Can be Utilized for Sustainable Agriculture?

- **Reduced Chemical Usage:** Leveraging plant defense mechanisms **may reduce the need for chemical interventions.** This could lead to a **decrease in pesticide application**, minimizing [environmental pollution](#) and promoting healthier ecosystems.
- **Enhanced Crop Resilience:** It can bolster **crop resilience against stressors.**
  - By implementing strategies that encourage communication between plants, such as **companion planting or intercropping**, farmers may improve overall crop health and resilience.
- **Genetic Engineering:** It can guide genetic engineering efforts. By enhancing plants' natural defense mechanisms through genetic modification, **scientists could develop crops that are more resistant to pests and diseases**, potentially reducing reliance on external interventions.

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