BEES ARE IMPORTANT TO THE SUSTAINABILITY OF AGRICULTURAL AND ECOLOGICAL SYSTEMS

Almost all flowering plants, such as food crops, depend on pollinators.

At least 1/3 of what we eat relies on animal pollinators, such as honeybees.

MYSTERIOUSLY VANISHING BEES

Clint is a commercial beekeeper with healthy beehives. He offers the beehives' services as pollinators to growers of a variety of crops across the United States. While his honeybees were pollinating cotton fields in Texas, they 'collapsed' mysteriously—the bees abandoned their beehives and did not return.

As the mysterious collapses persisted and intensified, bee researched termed it 'colony collapse disorder' or CCD. By 2006, beekeepers (commercial and recreational) in the United States had lost between 15% to 75% of their beehives due to CCD.

THE CCD CONTROVERSY

Stakeholders, including as researchers, beekeepers, crop growers, government regulators, and agrochemical companies, have different understandings of what CCD is, what causes it, and what should be done about it. Most agree that we do not understand why beehives become susceptible to CCD in the first place.

GAME: CREATE YOUR OWN EXPERIMENT

You are a honeybee scientist. You are interested in investigating the link between newer systemic pesticides and CCD. You need to design your next experiment.

Test **one direct causal factor or test **multiple** indirect factors?**
one
You chose one.

Testing a direct, causal effect emphasizes precision and control, rather than reflecting nature's complexity. Now, you need to decide the level of pesticides you will expose the bees to.

Test a **high or **low** dose of pesticide?**
low
You chose low.

Low doses model the likely exposure bees have on agricultural fields. You may perform your study in a laboratory setting or in fields and bee yards.

Will the experiment take place in a **lab or **field**?**
field
You chose field.

While field studies may provide more realistic conditions, you will need to seek experimental control of all potentially confounding environmental variables. For example, consider how you might keep the honeybees in your control plot from traveling to the treated plot?

Type **next**
next
You chose next.

Experiment Results: no effects were observed in bee colonies exposed to field-realistic (low) dosages
Critique From Stakeholders: skeptical of reliability since bees experience a vast amount of environment variability in field studies

Do you want to **end or **restart** game?**
end
You chose end.

Game over.
Here are your methodological choices:

['one', 'low', 'field', 'next', 'end']

This game was based on and inspired by the book 'Vanishing Bees: Science, Politics, and Honeybee Health' by Suryanarayanan and Kleinman.