Bug BLASTer: Exploring insect diversity in the soybean field using DNA sequence analysis
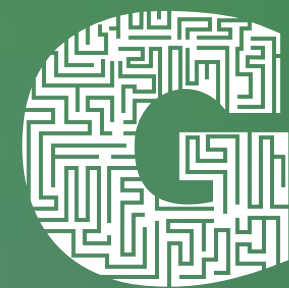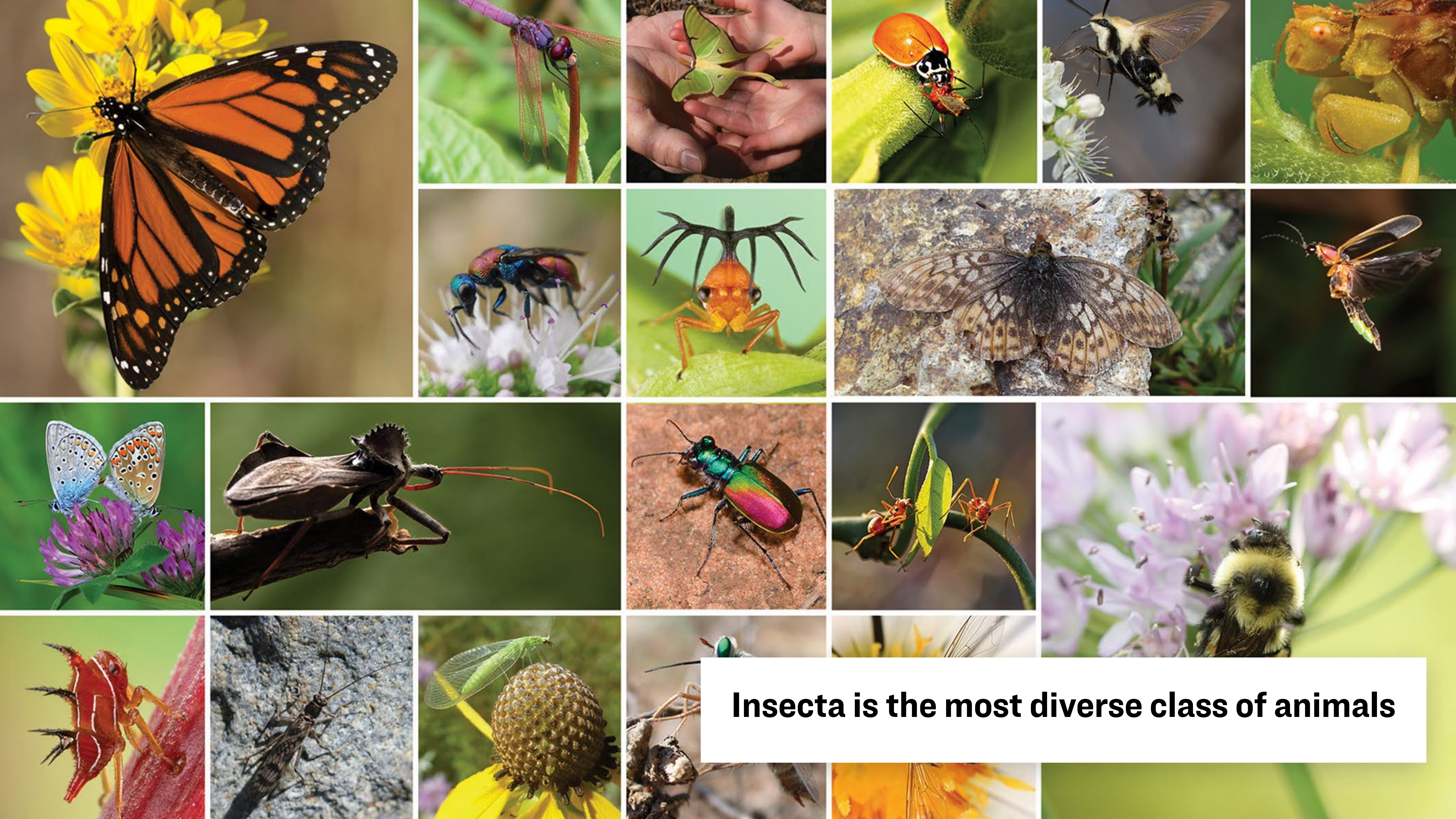
GROW NEXT GEN

Insecta is the most diverse class of animals

Insects are serious pests in agriculture

- Current yield loss due to insects is 20% worldwide

- Projected yield losses will increases 10–25% for every degree Celsius rise in average global temperature.

- Temperate zones will suffer the most.

science.org/doi/full/10.1126/science.aat3466

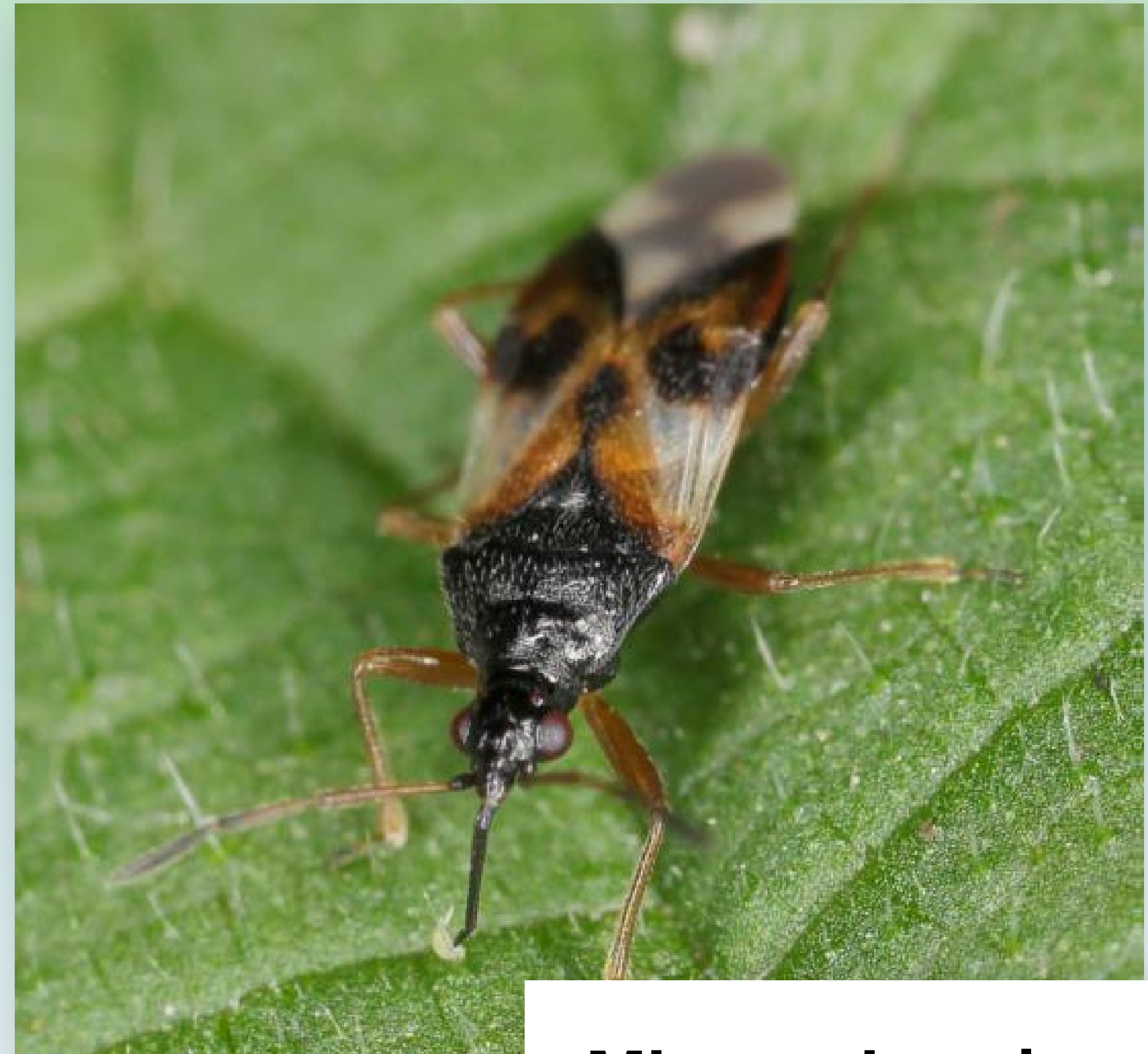# Harmful insects in soybean fields

Soybean aphids

Beneficial insects in soybean fields
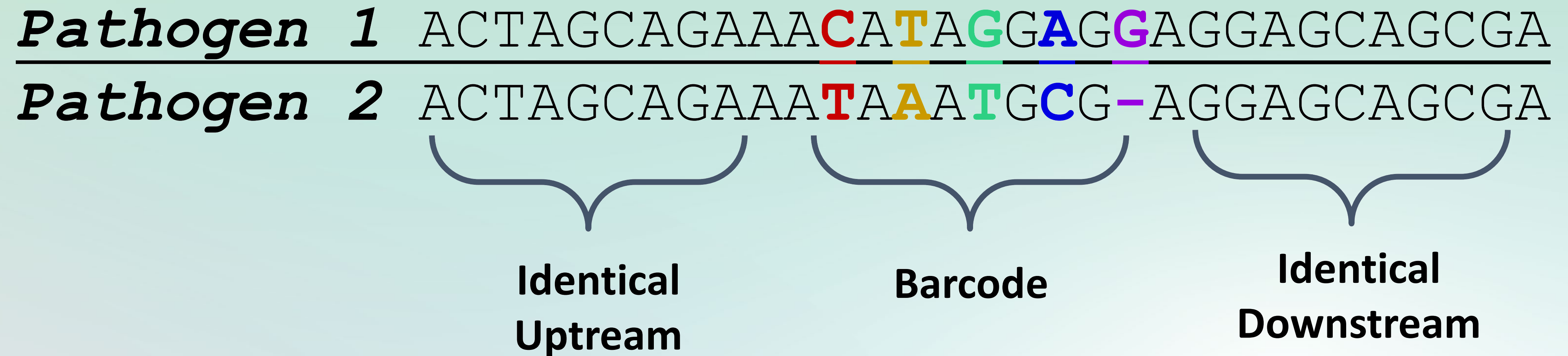

Lady bird beetle

Minute pirate bug
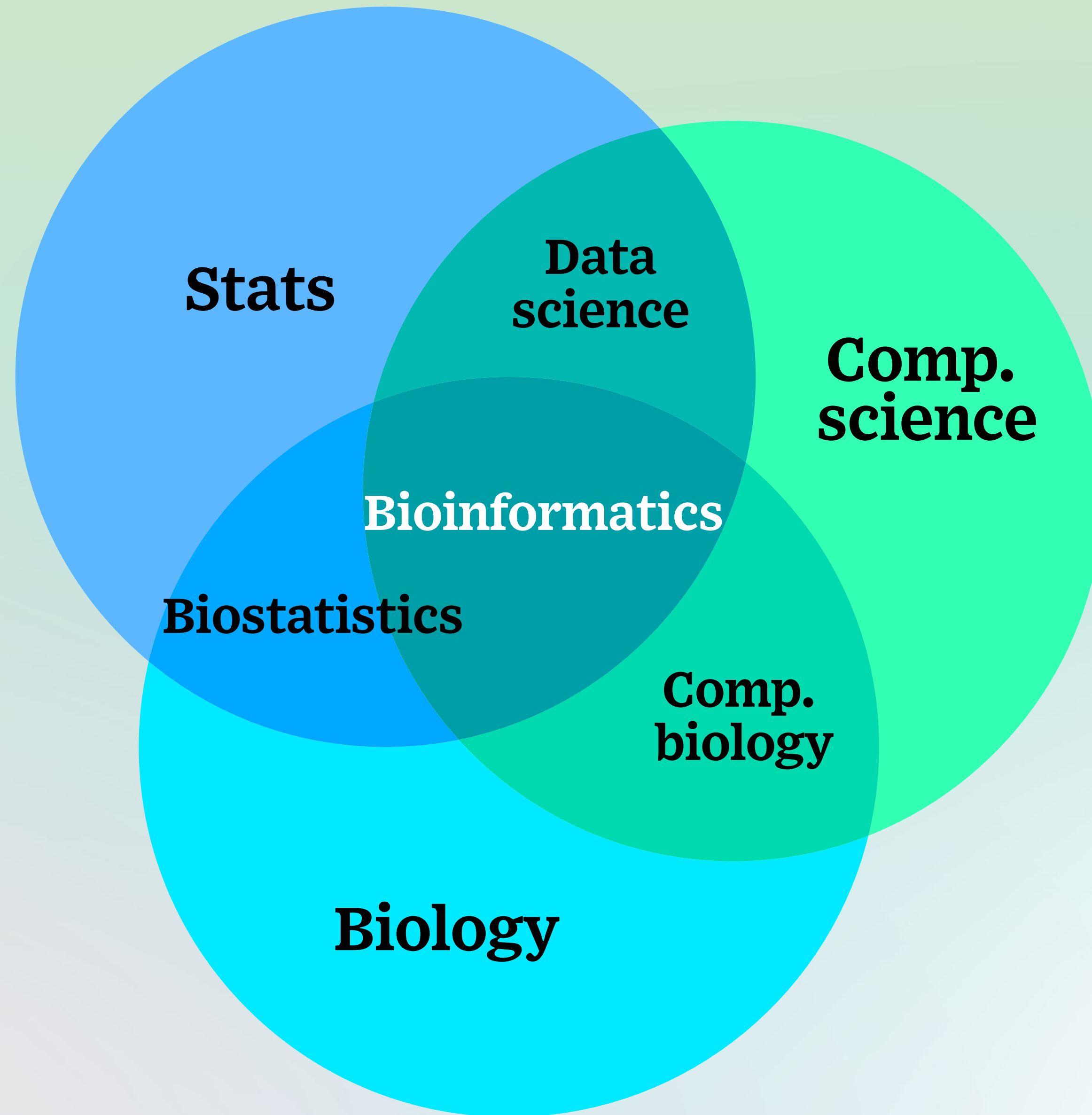
Barcodes

Linear lines that optical scanners (barcode readers) can determine a product based on lines of various widths.

0 36000 29145 2

9 87654 32109 8

Pasta 1

Pasta 2

Barcodes

Regions of DNA that differ between species.

Bioinformatics
aims to organize,
analyze,
and interpret
biological data.

Goals

- Describe the barcoding gene used for insect ID

- Use a public database to ID insects through genetic analysis

- Describe the impact of insects found at Crooked Lane Farm

Scenario

Crooked Lane Farm is having trouble with production of soybeans and scouting has revealed considerable insect damage in the field.

- Follow the steps within the activity to ID the insect(s) based on the assigned sequence(s)

- Answer questions related to the genetic analysis and how the farmer should respond to the identified insect(s)

Getting started

- NCBI website: **ncbi.nlm.nih.gov**

- Bug BLASTed sequences: **grownextgen.org/go/bugs**