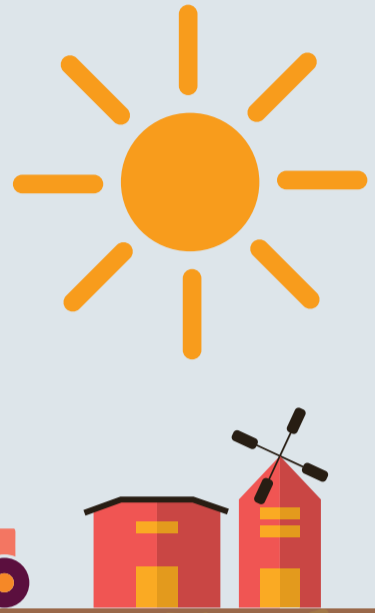


# HOW DOES CLIMATE CHANGE IMPACT AGRICULTURE?

Climate change causes erratic weather patterns, extreme temperatures and changes in natural resources, threatening farmers' ability to sustainably produce and maintain quality crops.

## EXCESSIVE HEAT

- Reduces surface water and depletes aquifers.
- Disrupts flowering and pollination of crops.
- Increases weed, insect and disease pressures.



## LOSS OF NATURAL RESOURCES

- Removes habitats and food for beneficial insects.
- Dries up water sources.



## DROUGHT

Causes crop failures and loss of arable land.

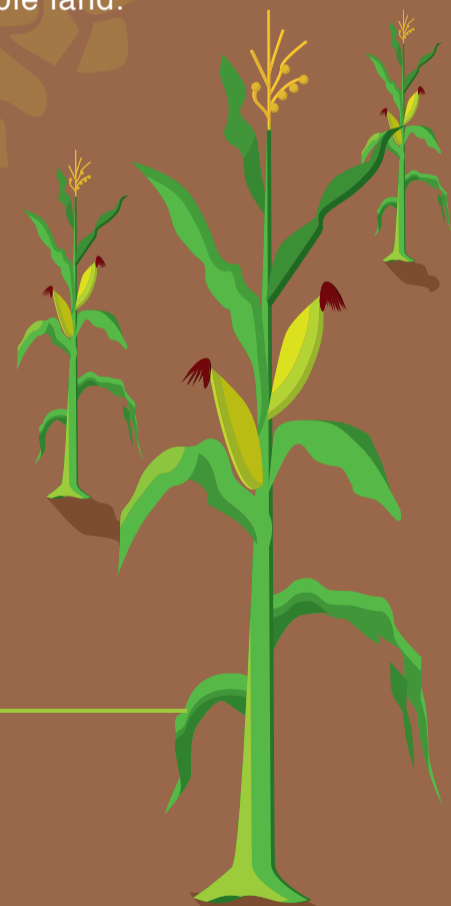
## EXCESSIVE PRECIPITATION

- Increases difficulty of planting.
- Raises flood risk.
- Damages crops.



## NEW PESTS AND DISEASE PRESSURES

- More competition for soil and water resources.
- Greater damage to crops



## FLOODING

- Removes topsoil
- Drowns crops

# HOW CAN FARMERS MITIGATE AND ADAPT TO CLIMATE CHANGE?

A full suite of crop protection and plant biotech products can help farmers:



Farmers need access to the best mix of technologies to look after our planet, feed a growing population and progress their communities.

## TODAY'S TECHNOLOGIES

### NO-TILL AGRICULTURE

Farmers remove yield-robbing weeds using herbicide-tolerant varieties and crop protection products instead of tillage practices.

Increase yields **67%**

No-till can increase global maize yields on irrigated hectares.



Drought tolerance can increase yields nearly **15% - 20%**

in times of severe drought for these key regions in 2050.



UNITED STATES



CHINA



EAST AFRICA

### DROUGHT TOLERANCE

Plant science researchers are developing plants that are droughttolerant and water-efficient.

### PLANT BIOTECHNOLOGY

In 2012, biotech crops helped slow the advance of climate change by **REDUCING CARBON EMISSIONS 27 BILLION KG**, equivalent to 11.9 million cars off the road for a year, due to less tillage, less fuel use and more carbon capture.

**REDUCING**  
carbon emissions  
27 billion kg



### Insecticides, Herbicides, Fungicides

### CROP PROTECTION

Crop protection products prevent nearly 40% of global rice and maize harvests from being lost every year.

Plant science researchers are developing products that could revolutionize agriculture in

# 2050

## NITROGEN-USE EFFICIENT VARIETIES

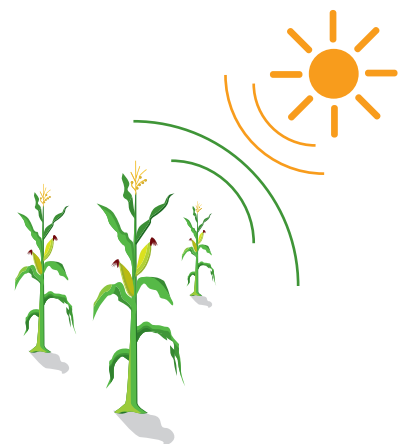
Enable a crop to better absorb and utilize nitrogen fertilizers, reducing carbon footprints and enabling a good harvest even in a volatile climate.

Biotech varieties are currently in development that could nearly double yields in Africa and Latin America when combined with irrigation.



## HEAT-TOLERANT VARIETIES

Are in development for rice and wheat. If successfully created, they could cut global wheat and rice prices by approximately 10%.



## GREATER YIELD STABILITY IN ERRATIC WEATHER

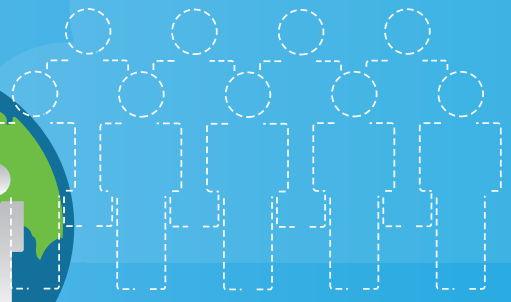
Long-term studies of biotech crops find significant reductions in risk and yield volatility after adoption. As new varieties reach the market, farmers will continue to build their resilience to climate change.

## GREATER CONTROL OF INSECTS, WEEDS AND DISEASES THROUGH NEW CROP PROTECTION PRODUCTS

Could improve global staple crop yields 20-30% and African maize yields by nearly 50% in 2050.

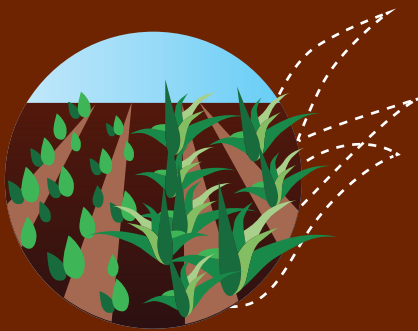
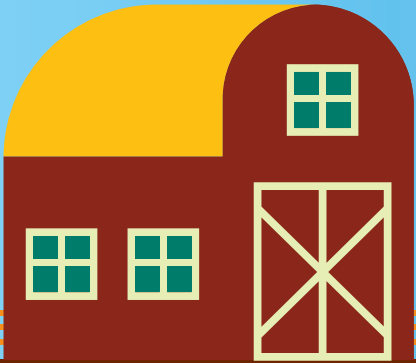


# BY 2050



our world's  
population  
will surpass.

## 9 billion



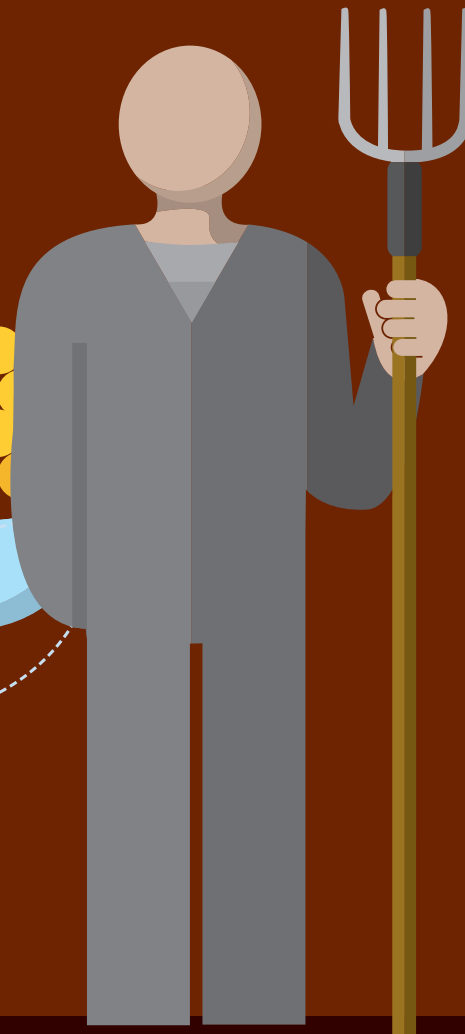
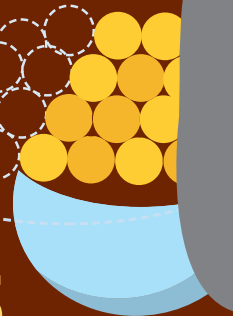
### TOO MEET OUR NEEDS GROWERS WILL

Need to produce more food — as much as 70% more than today — while reducing farming's footprint.

### HOWEVER, OUR WORLD'S CLIMATE IS CHANGING

Rapidly and as droughts, floods and unpredictable weather become more common, it is becoming harder for farmers to grow our food.

70%  
MORE  
FOOD



### WE NEED NEW AGRICULTURAL TECHNOLOGIES

That can help our farmers adapt, become more resilient and meet the growing challenges our world will hand to them in the decades ahead.

