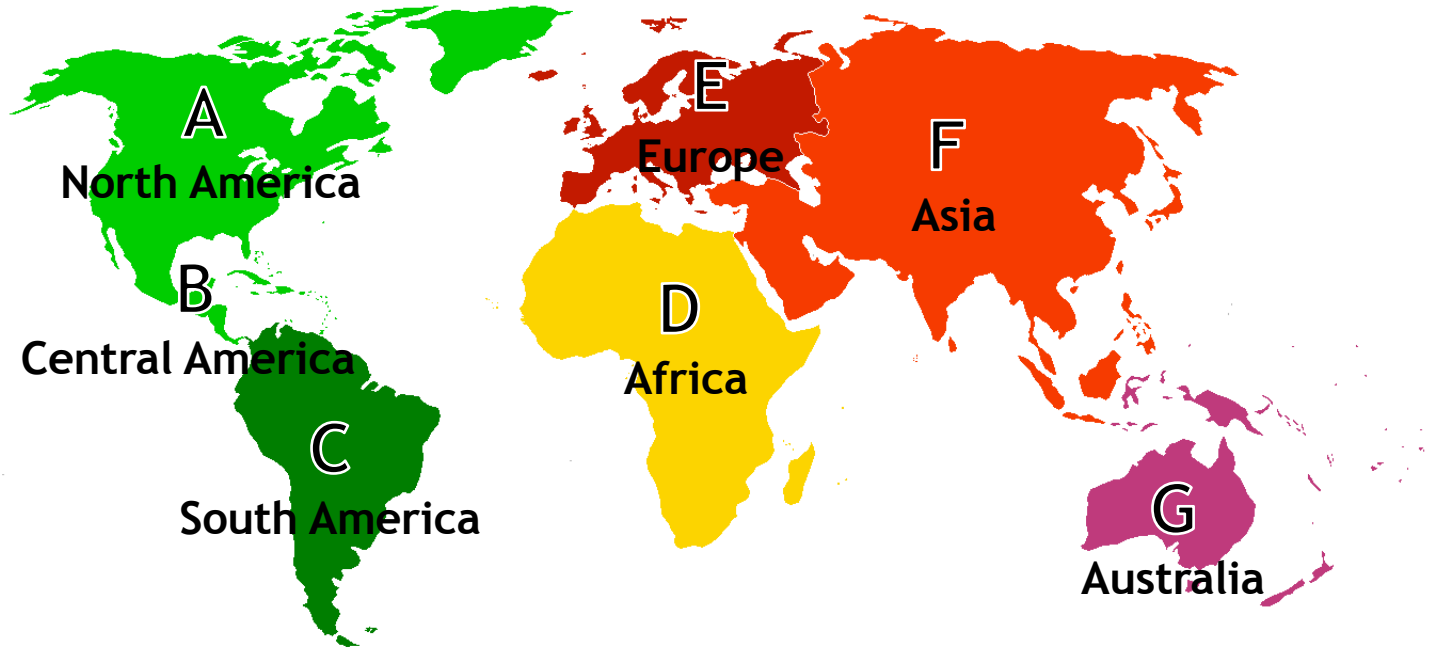
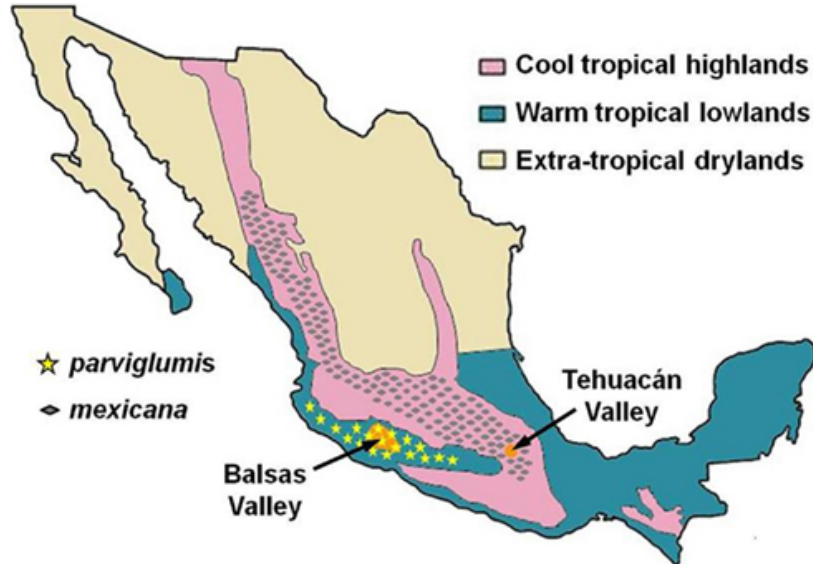


Where did maize originate?



B. Central America! Researchers agree that maize originated in Mexico before spreading to other parts of the world.



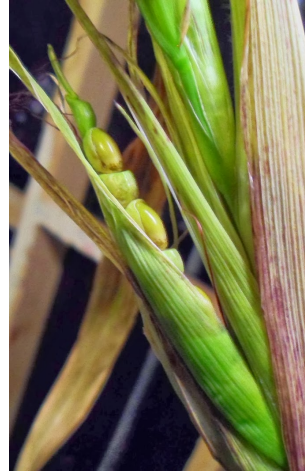
Which grain is the wild ancestor of maize?



A
wheat



B
sorghum



C
teosinte



D
millet

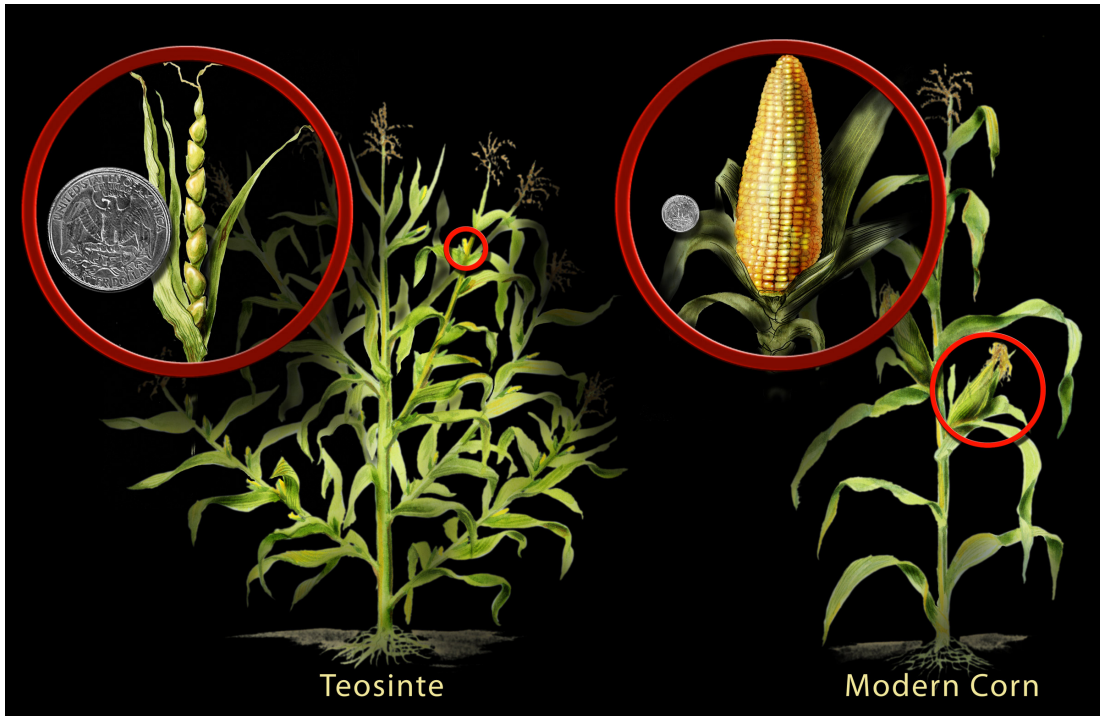


C. Teosinte!

The corn we know today was domesticated from wild teosinte between 7,000-10,000 years ago. Despite many differences in appearance, they are even in the same species, *Zea mays*!

Researchers compare maize and teosinte to better understand how humans have developed modern varieties of corn.

How many differences can you spot?

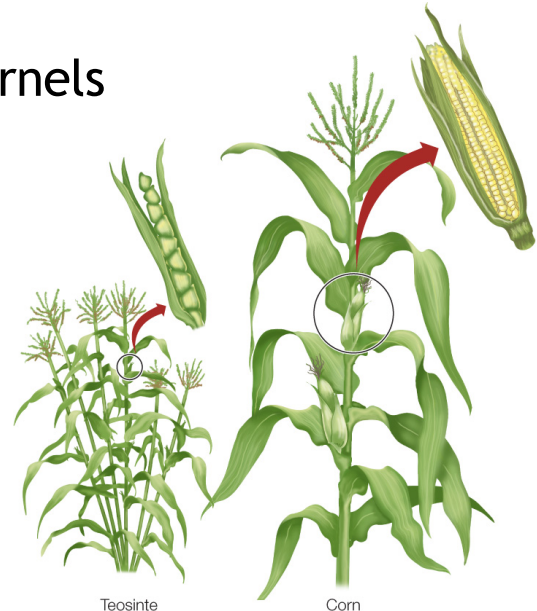


If you think these two plants look similar, you are correct!
Teosinte is the wild ancestor of maize.

Compared to teosinte, maize has:

- Larger ears with many rows of kernels
- Single vs. multiple stalks
- One vs. many tassels
- Kernels with no hard seed coat

Can you think of why these differences are important?



What color are maize kernels?



Almost any color!



Which picture shows a female maize flower?

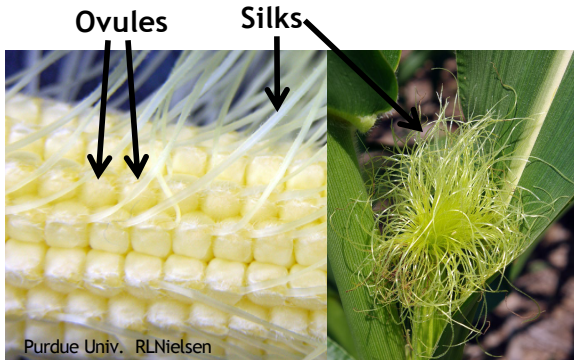


The flower on the **left** is the **female flower**, also known as the **ear**, and produces many **silks**.

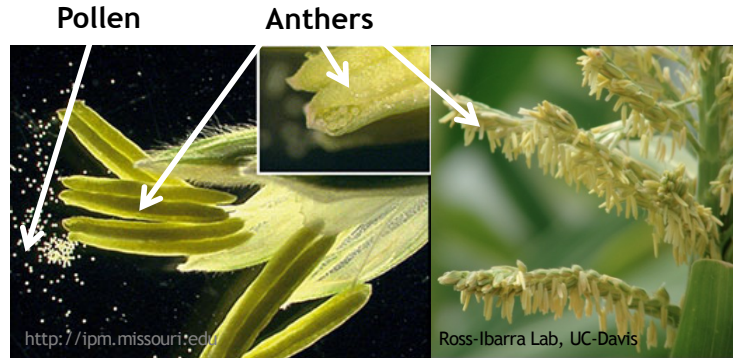
The flower on the **right** is the **male flower**, or **tassel**, and produces the **pollen**.

Kernels develop when pollen from the male flower lands on the silks of the female flower.

Ear (Female)



Tassel (Male)



How many **kernels** does a single silk produce?



- A. 1
- B. 10
- C. 50
- D. 100

A. 1



Once fertilized,
each silk produces
a single kernel!



What makes popcorn pop?

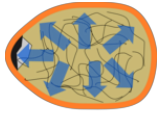


- A. Heat and pressure
- B. Microwaves
- C. Dynamite
- D. Magic

A. Heat and pressure!

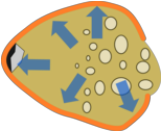


A popcorn kernel is mostly made up of **starch** and is surrounded by a strong outer coat called the **pericarp**.



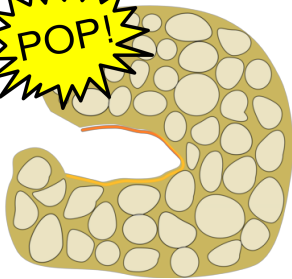
As you **heat** up the kernel, the moisture inside also gets hot and would like to turn into **steam**. However the pericarp prevents the water from expanding into steam.

↑ ↑
HEAT



As the kernel heats up, the **starch molecules** unwind in the water that is trapped inside to **form a jelly**.

POP!



At 180°C , the pressure inside the shell increases enormously, causing the shell to split and release the pressure.

Once the pressure drops, the water in the jelly-like starch boils and **expands by 1000-2000X**, converting the jelly into a **foam** which we call **popcorn**!

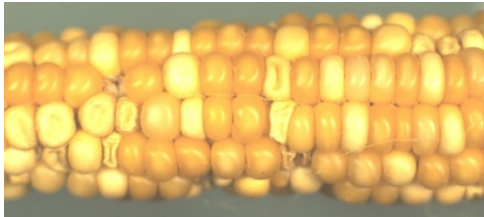
Why is sweet corn sweet?



- A. Artificial sweetener
- B. Mutations
- C. Increased starch
- D. It is a great unsolved mystery

B. Mutations! There are several mutations that **block starch synthesis**, resulting in an accumulation of sugar, which provides sweetness, and/or phytoglycogen, which gives sweet corn its creamy texture.

Different mutations have different effects on the flavor and texture of sweet corn. Two of the mutations, Shrunken2 and Sugary1, are described below. **Can you guess which kernels in the pictures below are mutants?**



Shrunken2 (sh2)

This mutation blocks all complex carbohydrates (starch and phytoglycogen), which causes accumulation of sugars.



Sugary1 (su1)

Mutations prevent the production of starch, and instead result in phytoglycogen.

Which of the foods below contain corn?



All of them!



Maize is one of the world's most popular food crops and is present in almost every food we eat. As a **staple crop**, corn also provides a large proportion of our nutritional needs.

Can you match the pictures to the type of corn?

1)



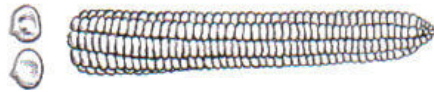
A. Flint

2)



B. Sweet

3)



C. Dent

Can you match the pictures to the type of corn?

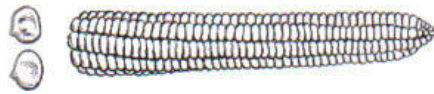
1)



2)



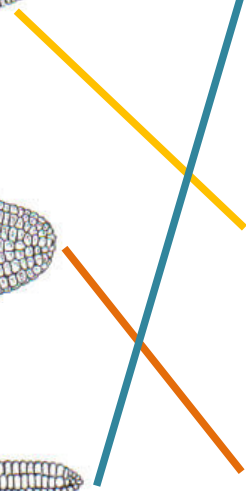
3)



A. Flint

B. Sweet

C. Dent



Which state produces the most corn?



A

Wisconsin



B

Nebraska



C

Iowa



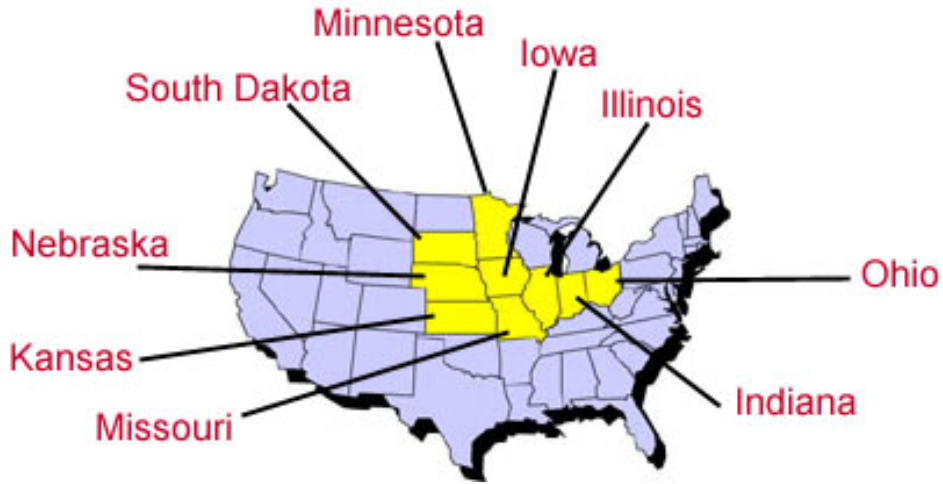
D

Illinois



E

Missouri



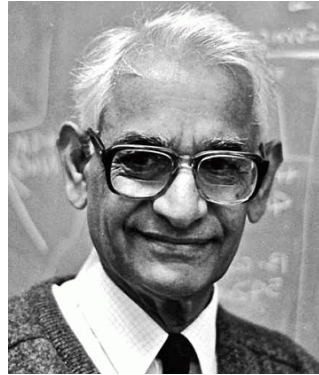
C. Iowa accounts for 18% of corn production in the United States, followed by other states in the **corn belt** such as Illinois, Nebraska, Minnesota, and Indiana. In 2016, twenty states, including Missouri, produced over **100 million bushels of corn!**

Which famous scientist and Nobel Prize Laureate discovered “**jumping genes**” in corn?



A

Barbara
McClintock



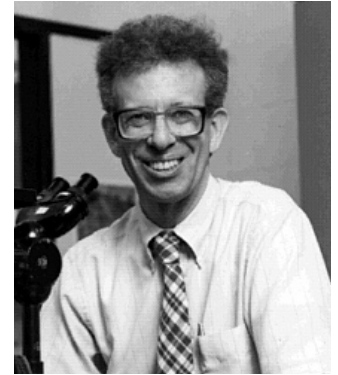
B

Har Gobind
Khorana



C

Rosalind
Franklin



D

Howard
Temin

A. Barbara McClintock made the groundbreaking discovery of “**jumping genes**”, also known as **transposons**, in 1948 by carefully observing color patterns in maize kernels.



Transposons are called “**jumping genes**” because they can change position in the genome, for example causing different coloration patterns in maize kernels. Jumping genes are found in most living organisms - they even make up **50% of the human genome!**