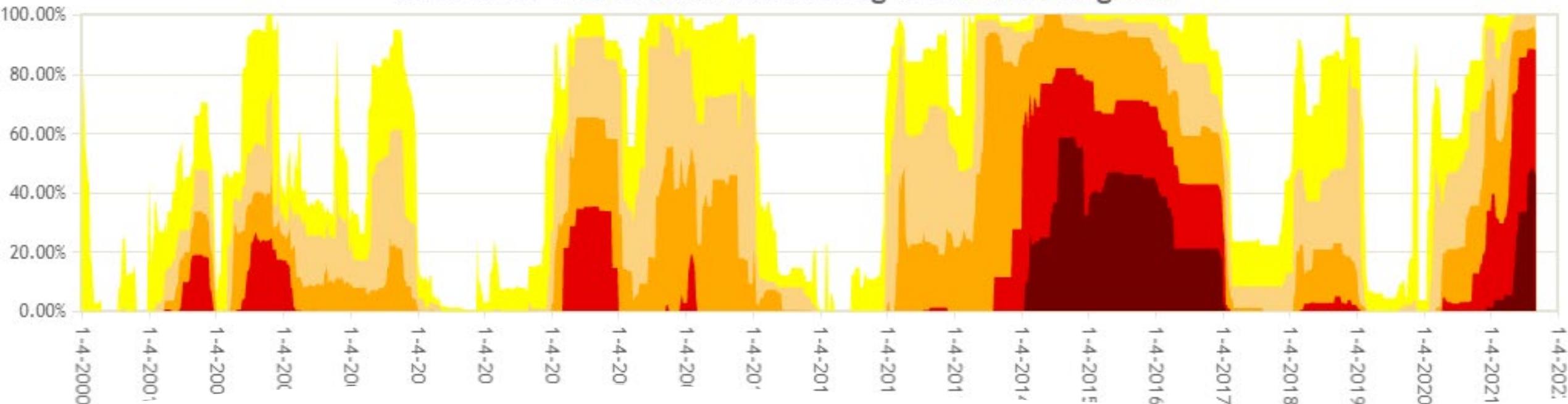


Understanding the Impact of Drought

How are **Botanists**
Using Science to
Provide Solutions?



California Percent Area in U.S. Drought Monitor Categories



Why Is this Important?
California is Experiencing an Extended Period of Drought

- Throughout its history, California has experienced many [droughts](#).
- During the last ten-plus years the state has experienced an increase in the frequency of droughts.
- **As the most populous state in the nation and a major agricultural producer, drought in California can have a severe economic and environmental impact.**

Botanists are Scientists Who Specialize in Plant Biology

Botanists conduct scientific research on plant life.

- **They study plant life as it relates to:**
- agriculture,
- nutrition,
- medicine,
- the environment and
- environmental policy





Botany: Plant Biology

Plant biology studies the chemistry of a plant including its [genetic](#) coding. The goal of plant biology is to determine how a plant functions, and how and why it evolved to be the way it is.

Genetics, Plants and Botanist Gregor Mendel

- Botanist Gregor Mendel is called the “Father of Genetics” and earned his fame by working with plants.
- His famous pea plant experiments in the 1850s and 1860s established many rules of genetics.
- His science work demonstrated that certain genes are retained through generations of plants, and that genes determine flower colors, seed size, plant height, and more.

[Video](#)



Plants Respond to Water Shortages In Very Complex Ways

All plant responses are directly controlled by the plant's genes.

- These responses can include changes in a plant's growth and in its ability to protect itself against toxic chemicals that build up in the plant during dry periods.
- If we can understand the genes that are involved in protecting plants against drought, in the future we might be able to develop crops that can tolerate global climate changes.



Meet a Botanist: Jill Farrant

- Professor in the Department of Molecular and Cell Biology in the Plant Stress Lab at the University of Cape Town
- Her focus is genetic research related to developing drought-resistant plants.
- She received the L’Oreal-UNESCO award in Life Sciences (2012)



Searching For Drought-Resistant Genes In Plants

Botanist Jill Farrant discusses her genetic research with resurrection plants.

- Resurrection plants aren't dead; they just look dead. But add a little water, and these plants completely transform.
- There are 135 species in the world that can do this, and plant biologist Jill Farrant believes these plants could be the answer to developing drought resistance in all plants.

[Video](#)



Drought-Busting Crops Are Already Taking Root!

Grow Ancient Plants For Food

Many ancient plants grown for food are drought resistant and can still be grown today. Some examples are:

- [Amaranth](#)
- [Cassava](#)
- [Chia](#)
- [Cowpeas](#)
- [Pearl Millet](#)
- [Quinoa](#)
- [Sorghum](#)

Would you grow and/or eat one of these ancient, drought resistant plants?

- Select a plant by clicking on its name to learn more about it.



Drought-Busting Plants Are Already Taking Root!

Grow Native Plants

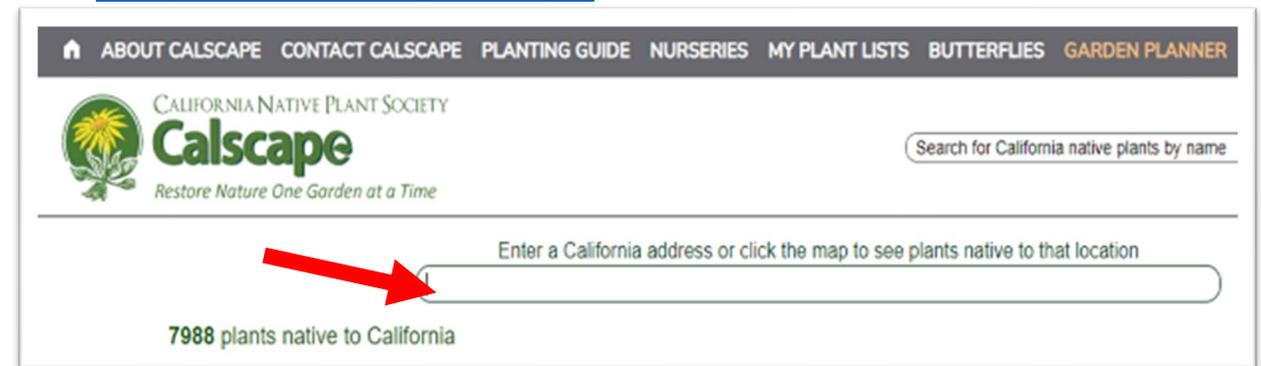
California has more than 6,000 types of native plants. That is more than any other state!

California native plants:

- Are drought tolerant.
- Provide plant diversity which helps support local ecosystems.
- Provide habitat for birds, butterflies and pollinators.

Learn more about native plants that grow in your area.

- Click on the California Native Plant link: <https://calscape.org/>



- Type in the name of your city, (you don't need to provide an address) then click on your choice of plant categories.

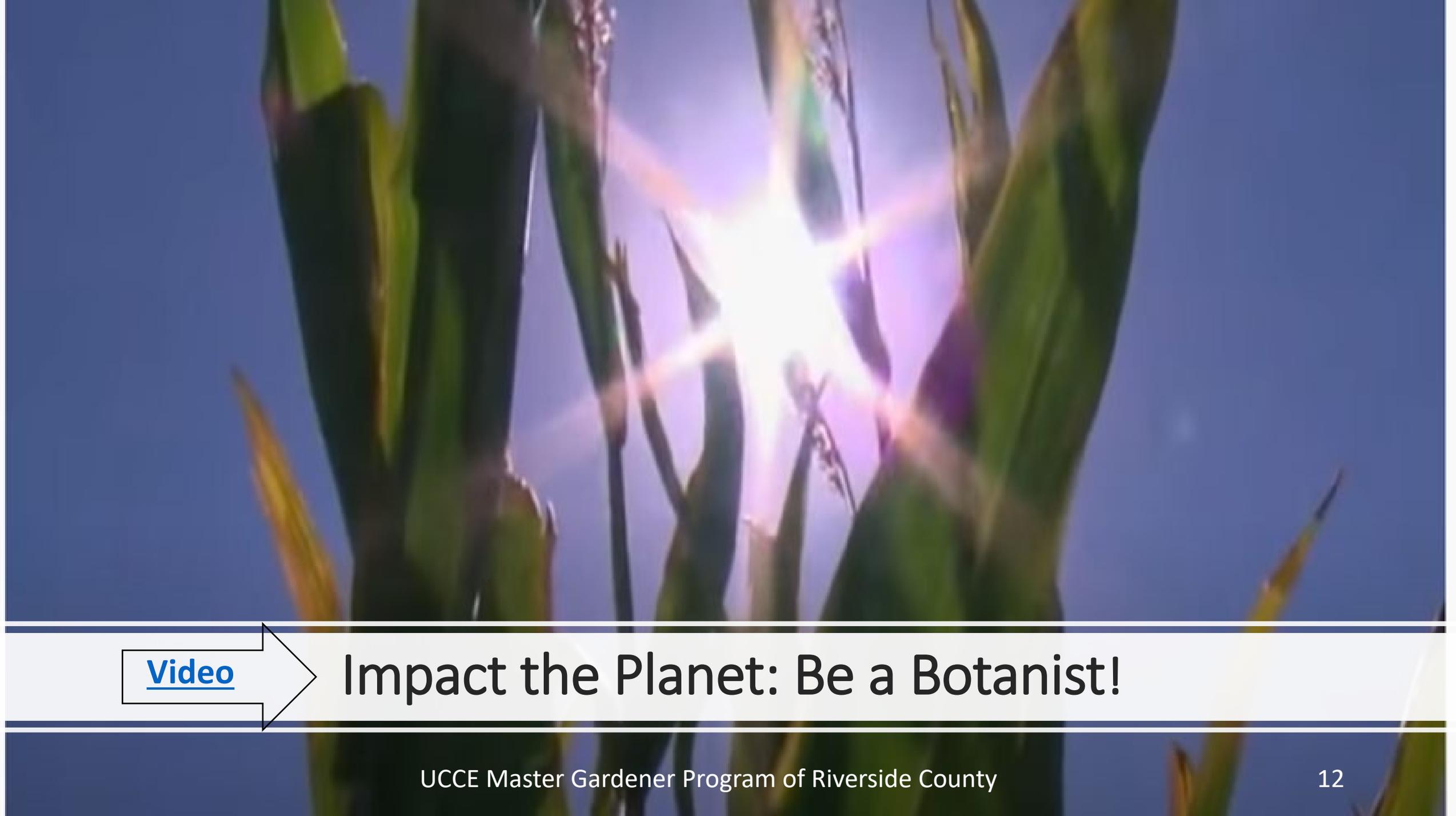
Drought-Busting Crops Are Already Taking Root!

Grow Newly-Developed Plant Varieties

Look for plants or seeds that are labeled “drought-tolerant,” “drought-resistant,” or “dry-farmed”.

- One example of this is Maize (corn) which is one of the world’s most important cereal crops.
- In the past decade, farmers - especially in sub-Saharan Africa - have tried new varieties that can withstand drought, allowing crops to grow when there is little or no rain.
- Check out this list of drought-busting crops: [UCCE Drought-Resistant Varieties](#)





[Video](#)

Impact the Planet: Be a Botanist!

Learn More About The Impact of Drought

Explore how Agronomists are using science to tackle drought or gain a deeper understanding about the importance of water for plants.

To access a science pathway, close this PowerPoint lesson and open your choice of the Agronomist or Water is Essential PowerPoints.

