Agriculture and Climate Change

Points of View...

Background:

The livestock that we raise for meat contribute to our carbon footprint. Cattle, sheep, and goats all have a unique ruminant digestive system that allows them to gain nutrition from grasses and other forage plants that humans or other monogastric animals cannot digest. The ruminant digestive system emits methane, a greenhouse gas into the atmosphere. Methane is shorter lived than carbon dioxide, but 28 times more potent. With the escalating effects of climate change, some urge the public to eat less beef.

THE CHALLENGE

Meat, particularly red meat, has a higher carbon footprint than most plant-based foods.

ONE PERSPECTIVE...

The consumption of meat should be significantly decreased or eliminated for the health of our planet.

ANOTHER PERSPECTIVE...

Meat can be consumed in moderation (following dietary guidelines) while still protecting the environment and promoting sustainability.

Why or Why Not?

Would a vegetarian or vegan diet improve the health of our climate?

Can GHG emissions from livestock be decreased through diet or other factors?

Does technology and the agricultural practices of each country impact their individual GHG emissions from livestock?

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Background:

When fossil fuels are burned, they release large amounts of carbon dioxide into the air. Carbon dioxide represents 79% of all greenhouse gas emissions in the U.S. (EPA) When greenhouse gases are trapped in our atmosphere, it causes global warming. Sea levels rise, extreme weather events become more prevalent, biodiversity is diminished, and poverty can increase as food security is challenged.

THE CHALLENGE

Fossil fuels are used to power vehicles (cars, trucks, semis, tractors), airplanes, and trains. Fossil fuels also heat and cool buildings, create electricity, and much more.

ONE PERSPECTIVE...

We should transition to using more electric vehicles to decrease the use of traditional gasoline/diesel fuel.

ANOTHER PERSPECTIVE...

The infrastructure to manage electric cars and the economics to purchase them doesn't exist. The electricity to charge them and the ability to produce the batteries counteracts the environmental benefit.

Why or Why Not?

Could electric trucks and tractors be used on farms?

Is biofuel a climate-smart solution for traditional gas/diesel engines?

Do electric vehicles have less greenhouse gas emissions than traditional gas-powered vehicles?

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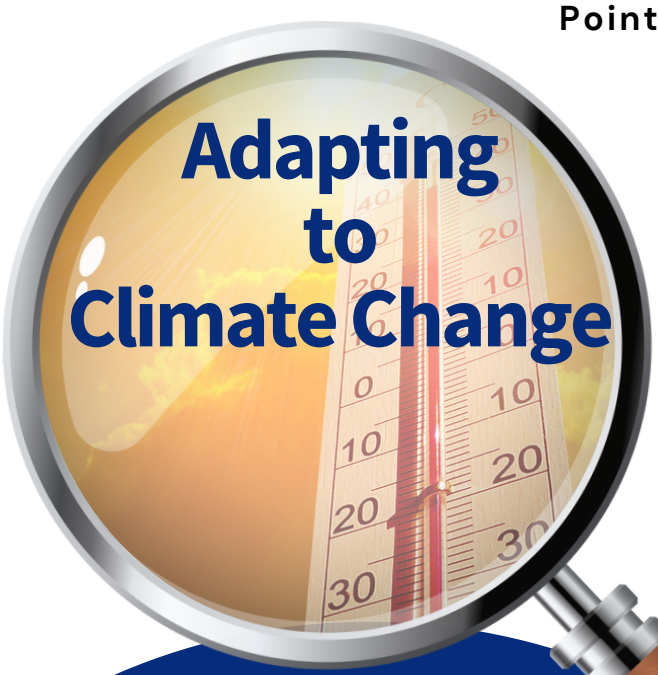
Points of View...



Background:

Adaptations are actions we can take to prepare for the impacts of climate change. Examples of adaptation include selecting plant varieties better suited for warmer weather patterns, increasing storm draining in cities to prepare for flooding, or planting trees along rivers and streams to provide more shade and cooler water temperatures.

THE CHALLENGE

Some effects of human activities on Earth's climate are irreversible in the timescale of humans that are alive today. Some adaptations must be made to live and produce food in a climate that is changing.

ONE PERSPECTIVE...

We need to use technology to develop crop varieties that are more resilient to warmer temperatures, use less water, resist pests and are generally more hardy in extreme weather events.

ANOTHER PERSPECTIVE...

We should limit technological innovations and move to more habitable areas as the globe warms.

Why or Why Not?

Can we adapt to a changing climate?

Is technological innovation key to adapting to a changing climate?

Could we simply move to cooler areas as the globe warms?

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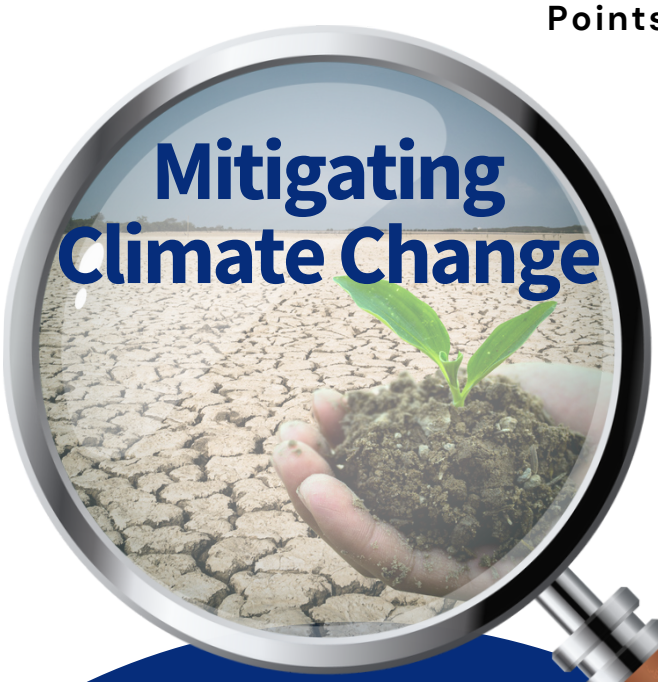
Points of View...



Background:

Mitigations refer to the steps we take to slow the rate of climate change by reducing greenhouse gases in our atmosphere. "Climate-smart" is a term often used to represent an improved practice that will decrease carbon emissions. Many scientists are dedicated to finding climate-smart farming practices and everyday solutions to decrease our carbon emissions.

THE CHALLENGE

Many everyday activities and agricultural practices release greenhouse gases that contribute to climate change.

ONE PERSPECTIVE...

Innovations in agriculture can significantly reduce greenhouse gas emissions. New technology and research are key to future sustainability.

ANOTHER PERSPECTIVE...

The only way to mitigate climate change is to scale back— fewer livestock, stop converting land to agricultural land, etc.

Why or Why Not?

Climate-smart farming practices can make a positive difference to our environment.

The best mitigations involve reducing or eliminating activities that emit the most greenhouse gases.

Mitigation will not be effective in my lifetime.

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Points of View...

Background:

Oceans and other water bodies cover 75% of our Earth, leaving 25% land. One third of the land is inhospitable (polar regions, deserts, etc.). One third of our land is habitable, but covered in houses, cities, and roads. The remaining one third of land is what we use to produce our food. Land has competing demands and multiple uses. For example, many public lands are used for both recreation and agricultural grazing. Livestock commonly graze on "marginal" lands that are unsuitable for crops due to limitations on water, climate, or soil.

THE CHALLENGE

Our population is growing, creating more demand for food and other necessities. Arable land to produce our food is limited.

ONE PERSPECTIVE...

Land should not be used to feed livestock. All arable land should be used to grow food for direct human consumption.

ANOTHER PERSPECTIVE...

Our land resources are managed and utilized best with both plant and animal source foods.

Why or Why Not?

We shouldn't dedicate two thirds of our agricultural land to feeding livestock.

Public lands should be used for grazing.

The agricultural lands currently being used to grow livestock feed (grain) should be converted to grow food for direct human consumption.

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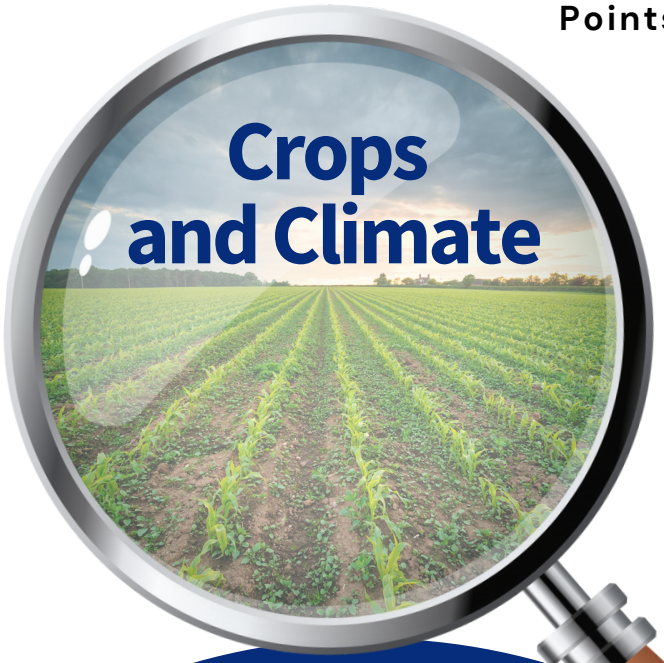
Points of View...



Background:

All crops require specific climate conditions to grow. Some crops prefer cooler temperatures and others require hot/tropical climates or specific soil conditions. Climate and geography are very critical to the successful growth and harvest of a crop. In addition to global warming, climate change also leads to more severe weather events such as flooding, extreme drought, or extreme temperatures that can lead to crop loss and food insecurity.

THE CHALLENGE

As the globe warms and changes, crop growth could be challenged.

ONE PERSPECTIVE...

Genetic engineering is critical to plant breeding. We need new GMO crop varieties that grow in a changing climate with less water and more resistance to pests and disease.

ANOTHER PERSPECTIVE...

As the climate warms, we should move crops to more suitable growing areas and possibly shift our diets to include crops suited to the growing conditions we have.

Why or Why Not?

Consumers should support scientists working to bioengineer seed varieties that can withstand the effects of climate change.

Our diets should shift to the foods most suited to our local climates.

Traditional selective breeding strategies are sufficient (without bioengineering technology) to improve our seed varieties.