



Garden of Temptation

Are GMOs the key
to solving the food
industry?

How can GMOs affect
the impact of global
climate change

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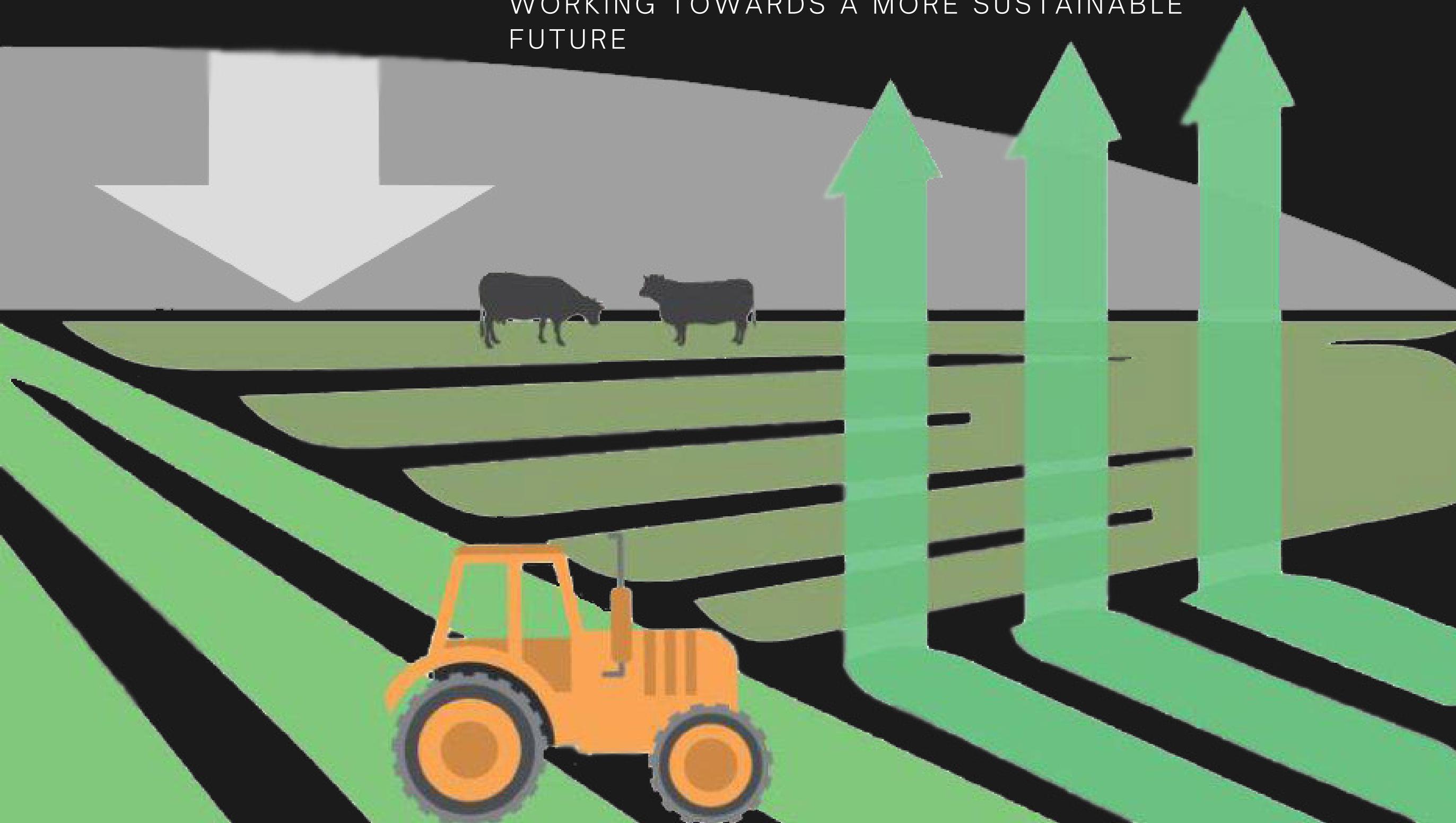
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Agricultural Emissions

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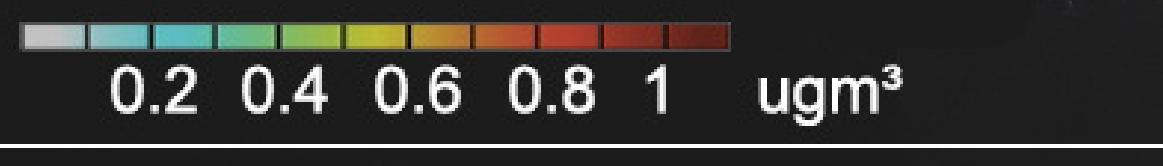
WORKING TOWARDS A MORE SUSTAINABLE FUTURE



Emissions
Tied to
Agriculture

MAP OF PARTICULATE MATTER (microgram per cubic meter)

Agriculture accounts for over 90% of all of the worlds ammonia emissions.

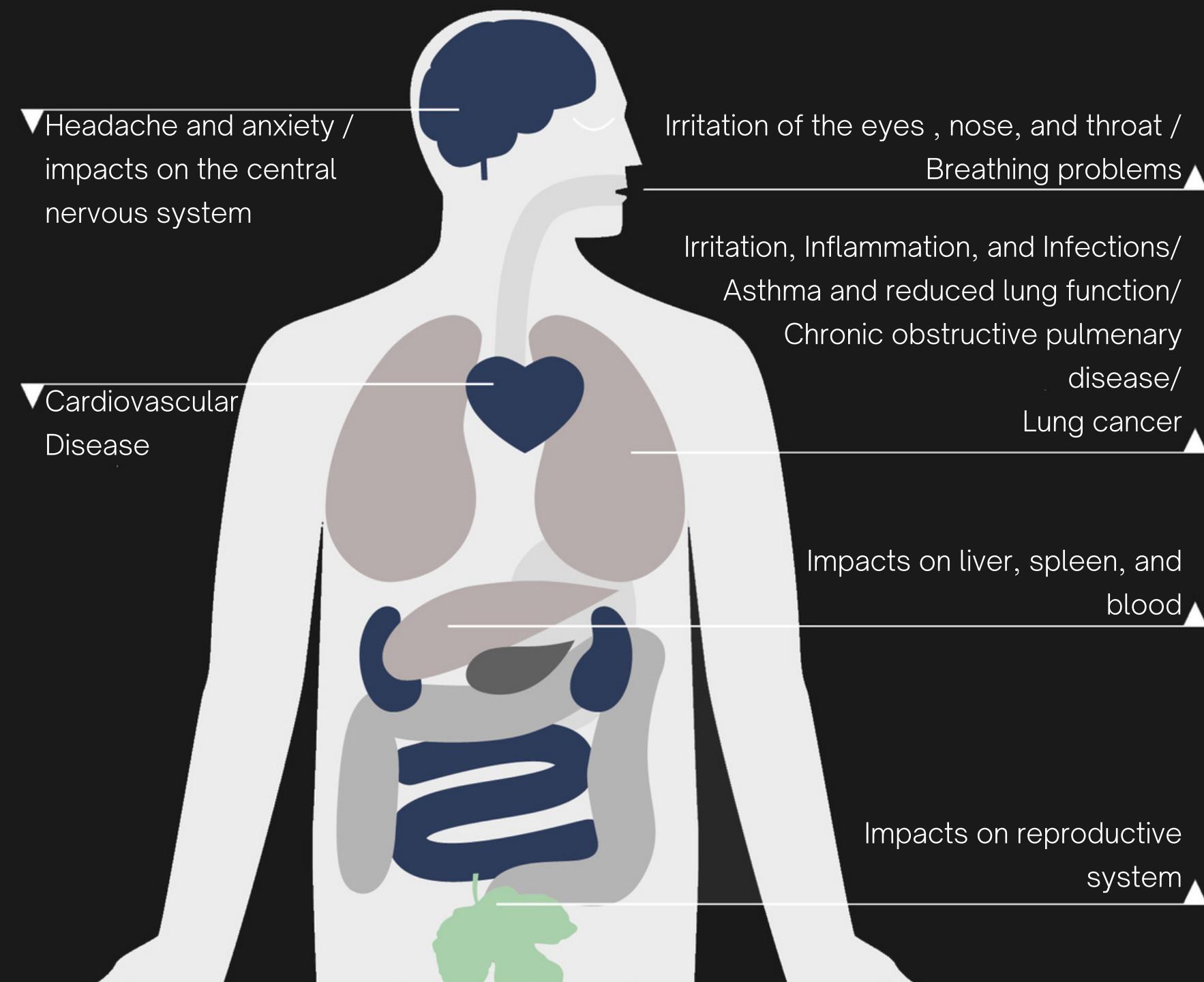
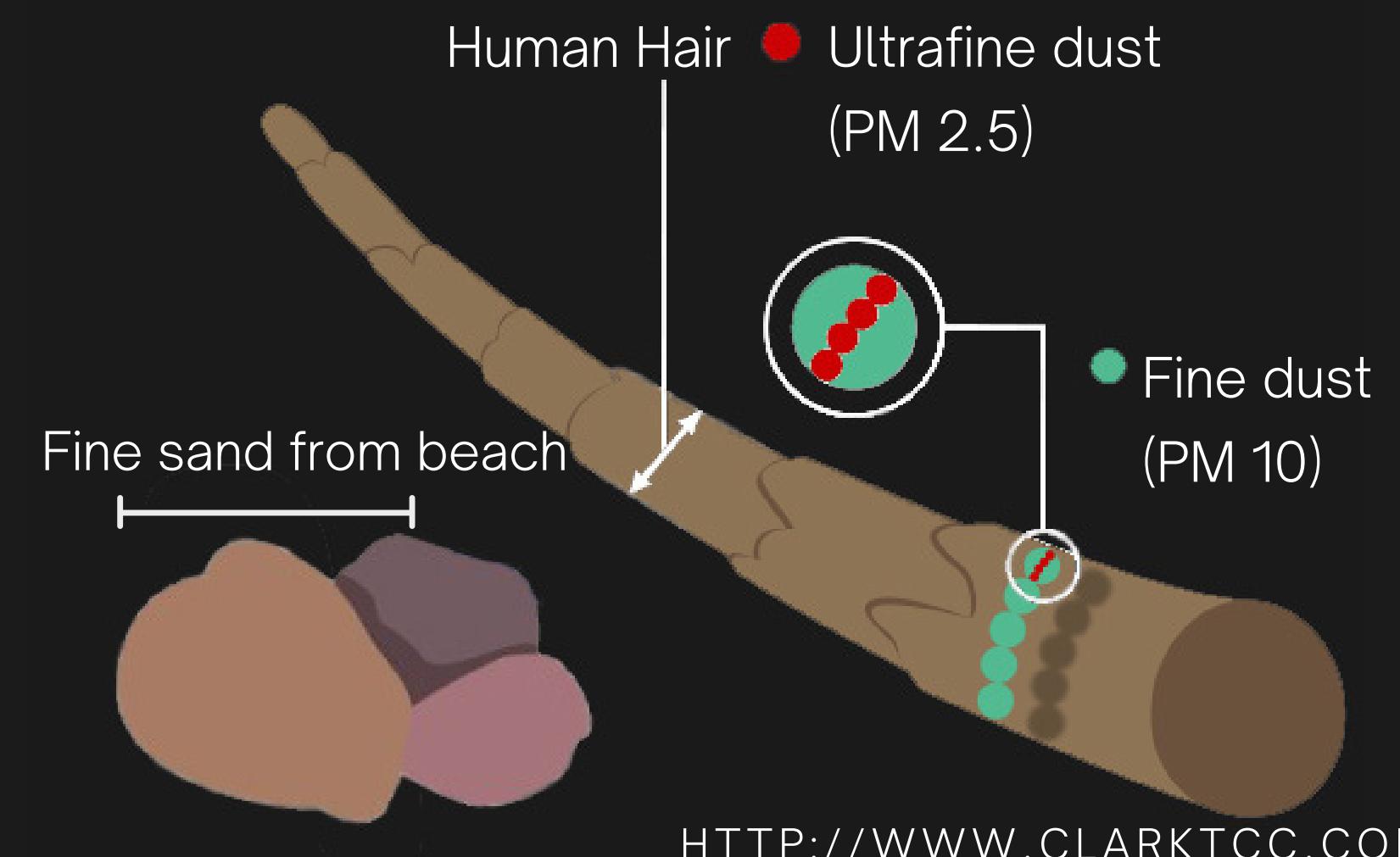


The map shows increase in annual mean surface concentration of particulate matter resulting from ammonia emissions associated with food export. Populated states in the Northeast and Great Lakes region, where particulate matter formation is promoted by upwind ammonia sources, carry most of the cost.

Emissions
Tied to
Agriculture

Particulate Matter & Agriculture

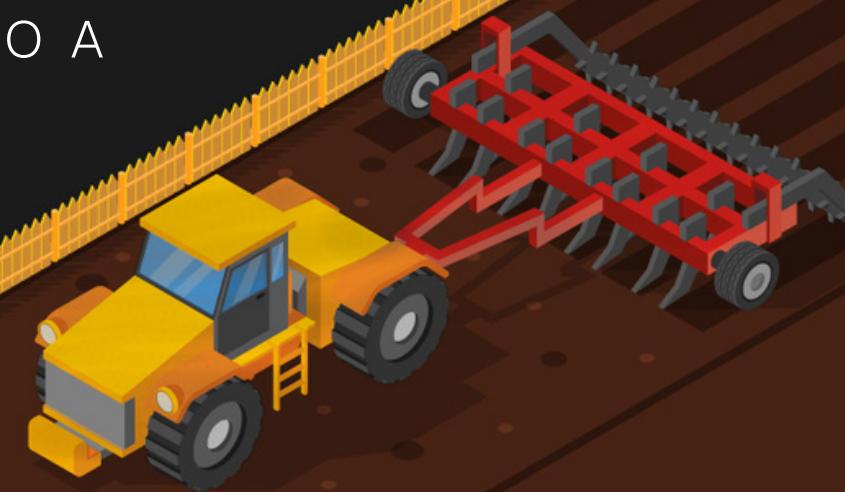
Ammonia reacts in the atmosphere to produce particulate matter (PM) which has significant impacts such as cardiovascular and respiratory disease.



Better Crops

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IT IS WIDELY ACCEPTED THAT INCREASES IN ATMOSPHERIC LEVELS OF GREENHOUSE GASES SUCH AS AMMONIA CARBON DIOXIDE, METHANE AND NITROUS OXIDE ARE DETRIMENTAL TO THE GLOBAL ENVIRONMENT. THEREFORE, IF THE ADOPTION OF CROP BIOTECHNOLOGY CONTRIBUTES TO A REDUCTION IN THE LEVEL OF GREENHOUSE GAS EMISSIONS FROM AGRICULTURE, THIS REPRESENTS A POSITIVE DEVELOPMENT FOR THE WORLD.



Herbicide tolerant crops enables farmers to till - or turn over and break up the soil - less often. This has increased nutrient rich matter up to 1,800 pounds per acre per year.



Less Tilling =



Emissions
Tied to
Agriculture

These crops reduce the volatilization of soil, greatly reducing the amount of ammonia released into the atmosphere

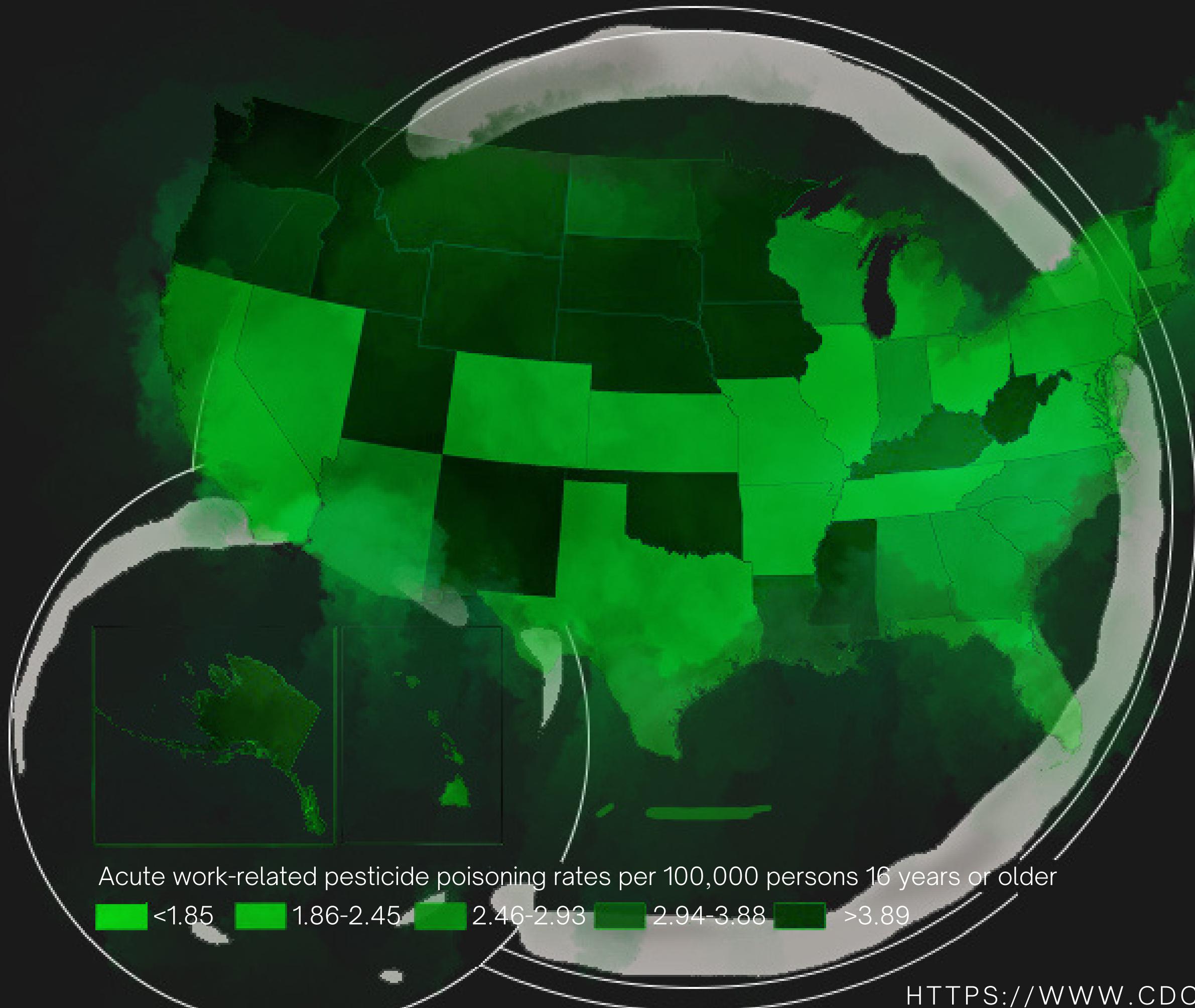
What dangers do
pesticides pose
towards human
health?



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Pesticides

PESTICIDES & HUMAN HEALTH



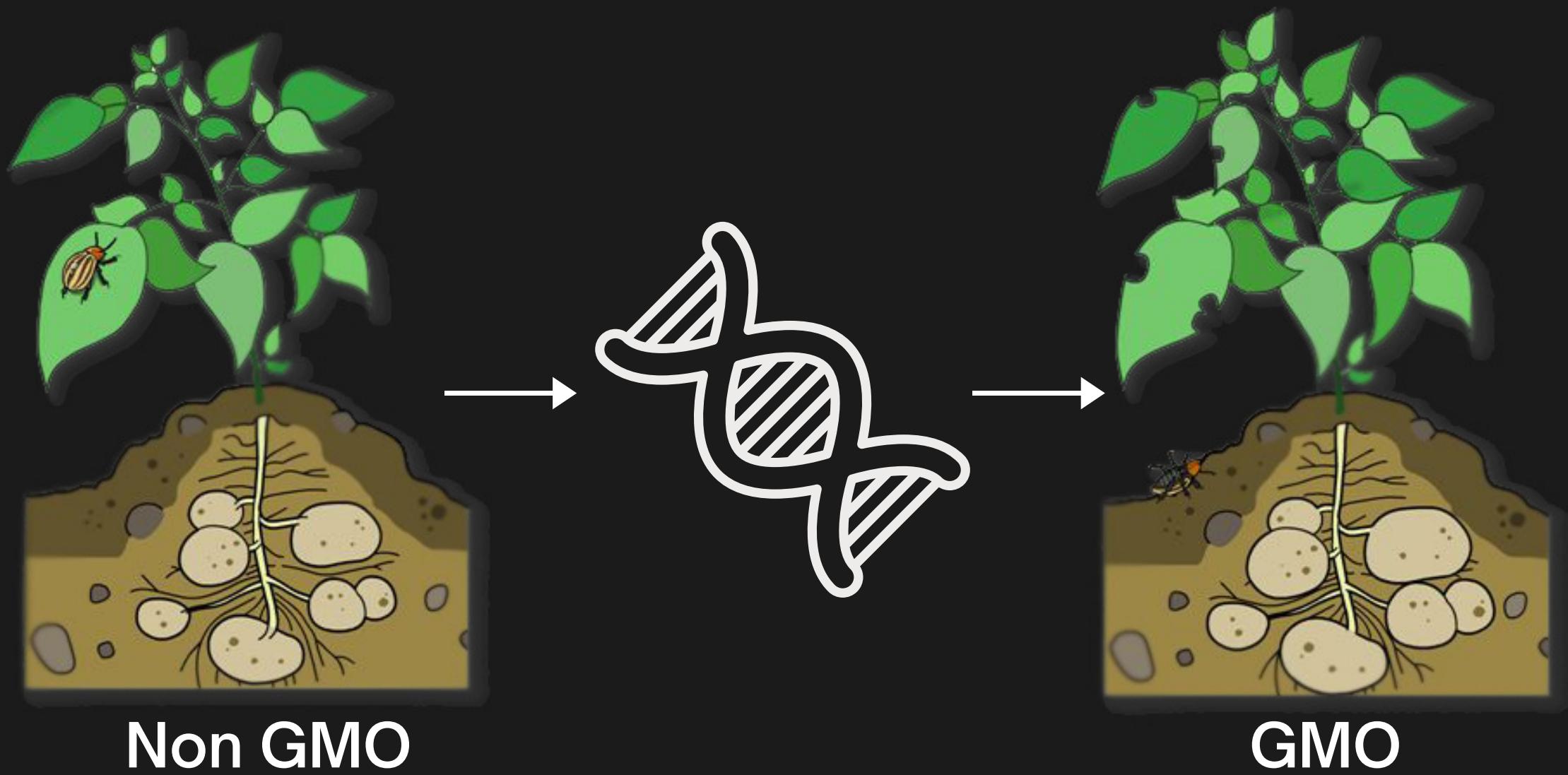
[HTTPS://WWW.CDC.GOV/](https://www.cdc.gov/)

PESTICIDES CAN CAUSE SHORT-TERM ADVERSE HEALTH EFFECTS, CALLED ACUTE EFFECTS, AS WELL AS CHRONIC ADVERSE EFFECTS THAT CAN OCCUR MONTHS OR YEARS AFTER EXPOSURE. EXAMPLES OF ACUTE HEALTH EFFECTS INCLUDE STINGING EYES, RASHES, BLISTERS, BLINDNESS, NAUSEA, DIZZINESS, DIARRHEA AND DEATH. EXAMPLES OF KNOWN CHRONIC EFFECTS ARE CANCERS, BIRTH DEFECTS, REPRODUCTIVE HARM, NEUROLOGICAL AND DEVELOPMENTAL TOXICITY, IMMUNOTOXICITY, AND DISRUPTION OF THE ENDOCRINE SYSTEM.

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Pest-resistant Crops

Potatoes can be genetically modified so that they are toxic to pests such as beetles, negating the need for harmful pesticides.



Pesticides

The potatoes remain non-toxic for human consumption and are deemed safe to consume by the USDA.

How can GMOs aid in the fight against Climate Change?



As our climate continues to heat up and the impacts of that warming grow more frequent and severe, farmers and farm communities around the world will be increasingly challenged.

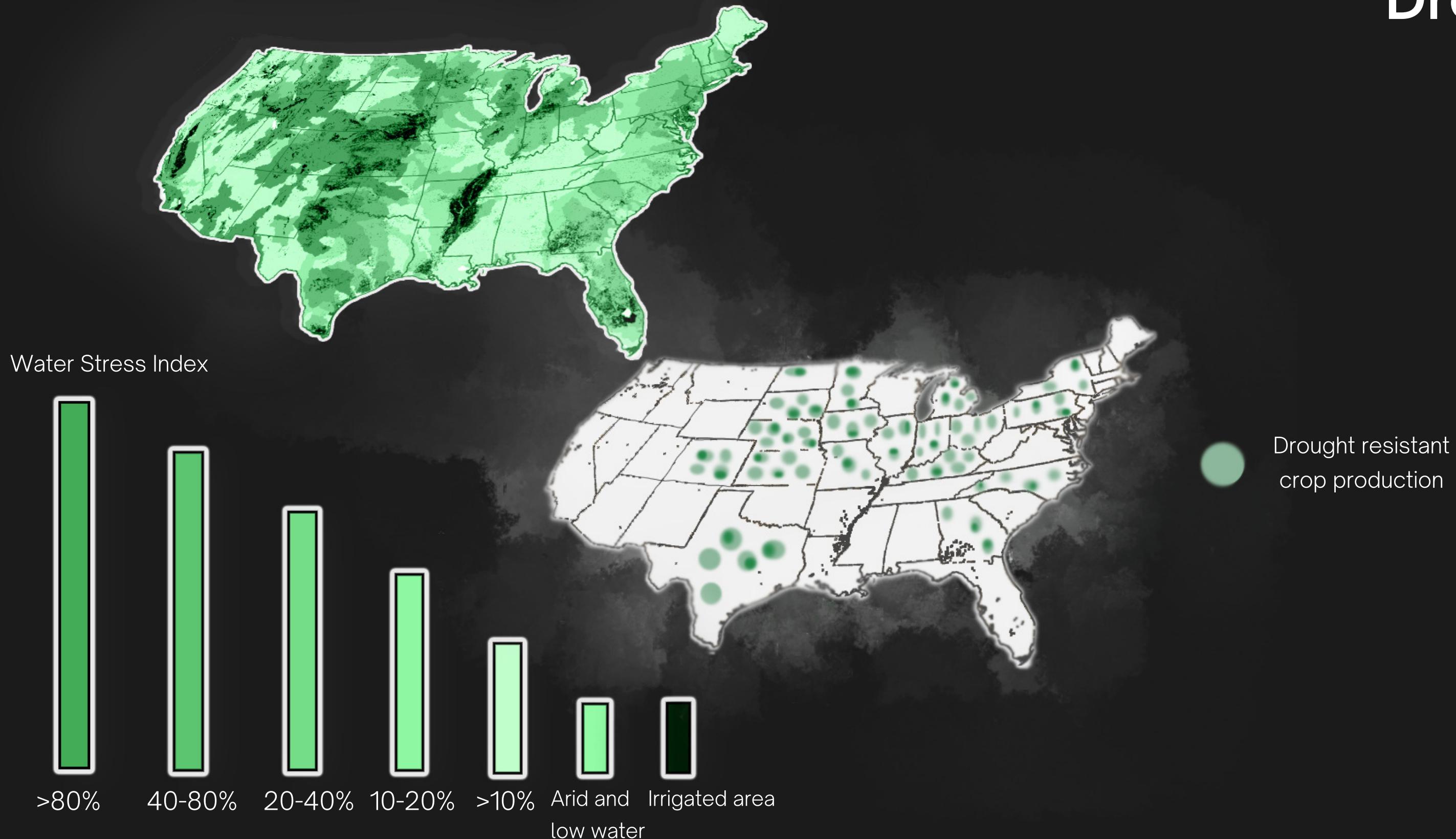
And US farmers won't be spared the damage that climate change is already beginning to inflict.



Combating
Climate
Change

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Drought-resistant Crops

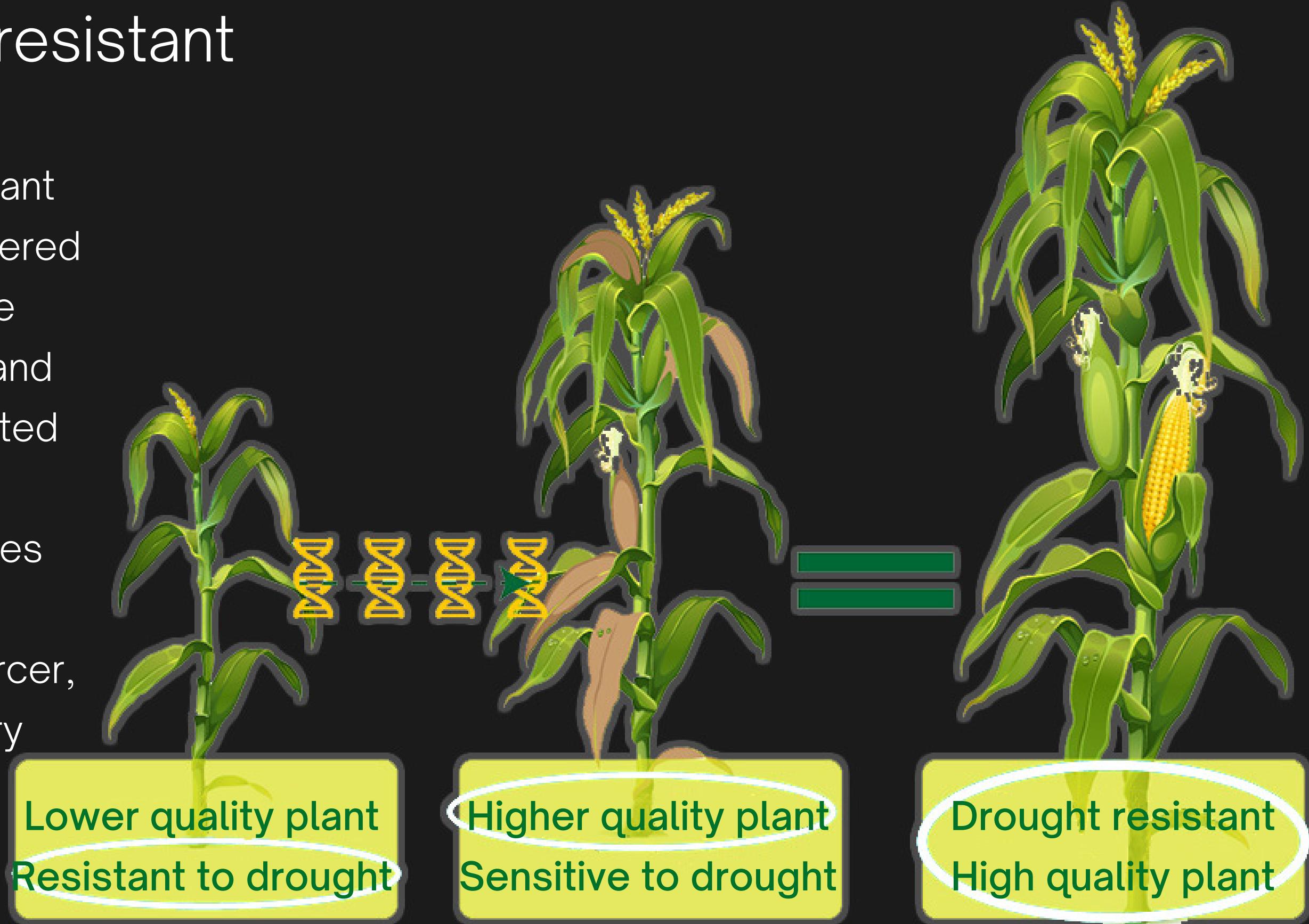


New technologies or management practices to avert or reduce the drought damages that lead to lower profitability would increase the resiliency of U.S. agricultural production, while also reducing farmers' reliance on Federal financial assistance. Newly available drought-tolerant (DT) corn is one such technology.

Combating Climate Change

Drought-resistant Corn

Drought resistant corn is engineered and will enable corn to grow and thrive with limited water. As the climate changes and water becomes scarcer, this will be very important to this major world crop.



Combating
Climate
Change

Frost Resistant Crops

Crops can be genetically modified so they are resistant to adverse environmental conditions.

For example, lettuces could be genetically modified to be resistant to frost.



GMO

Non-GMO

How much food is wasted?



On average, 1,160 pounds of food is lost to the garbage pail each year by an American family of four due to unreasonable cosmetic standards.

Food Waste

In the United States alone, 40 percent of food gets tossed every year—and that amounts to \$162 billion in waste annually, according to the Natural Resources Defense Council. This can serve 58,064,516,129 meals using the national average amount spent on a meal, \$2.79.

Density of food redistribution centers

GROCERY WASTE

6.76% 11.34%

MEAL WASTE

5.58% 8.95%

[HTTPS://WWW.REFED.COM/](https://www.refed.com/)
[HTTPS://WWW.HUFFPOST.COM/](https://www.huffpost.com/)

Americans throw away almost as much food as they eat because of a “cult of perfection”, deepening hunger and poverty, and inflicting a heavy toll on the environment. Vast quantities of fresh produce grown in the US are left in the field to rot, fed to livestock or hauled directly from the field to landfill, because of unrealistic and unyielding cosmetic standards.

Using biotechnology, we now have GMO apples, limes, and other fruits that have been approved for consumption that are non-browning and non-bruising, eliminating the cosmetic issues that often cause people to throw them away. There are also GMO potatoes that are also less prone to browning, bruising and black spots, meaning fewer will end up in landfills.



GMO

NON GMO

THE AESTHETIC DILEMMA

| Food Waste

Organic or Overpriced?



| Food
Insecurity

Food Insecurity



Of the 318.9 million people in the United States, an estimated 49.1 million (or one in seven) were food insecure according to the United States Department of Agriculture.

Price difference between GMO and costlier organic food.