GREAT AGRICULTURAL CHALLENGES

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MISSION STATEMENT

To deliver solutions to great agricultural challenges

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AGRICULTURE IS...

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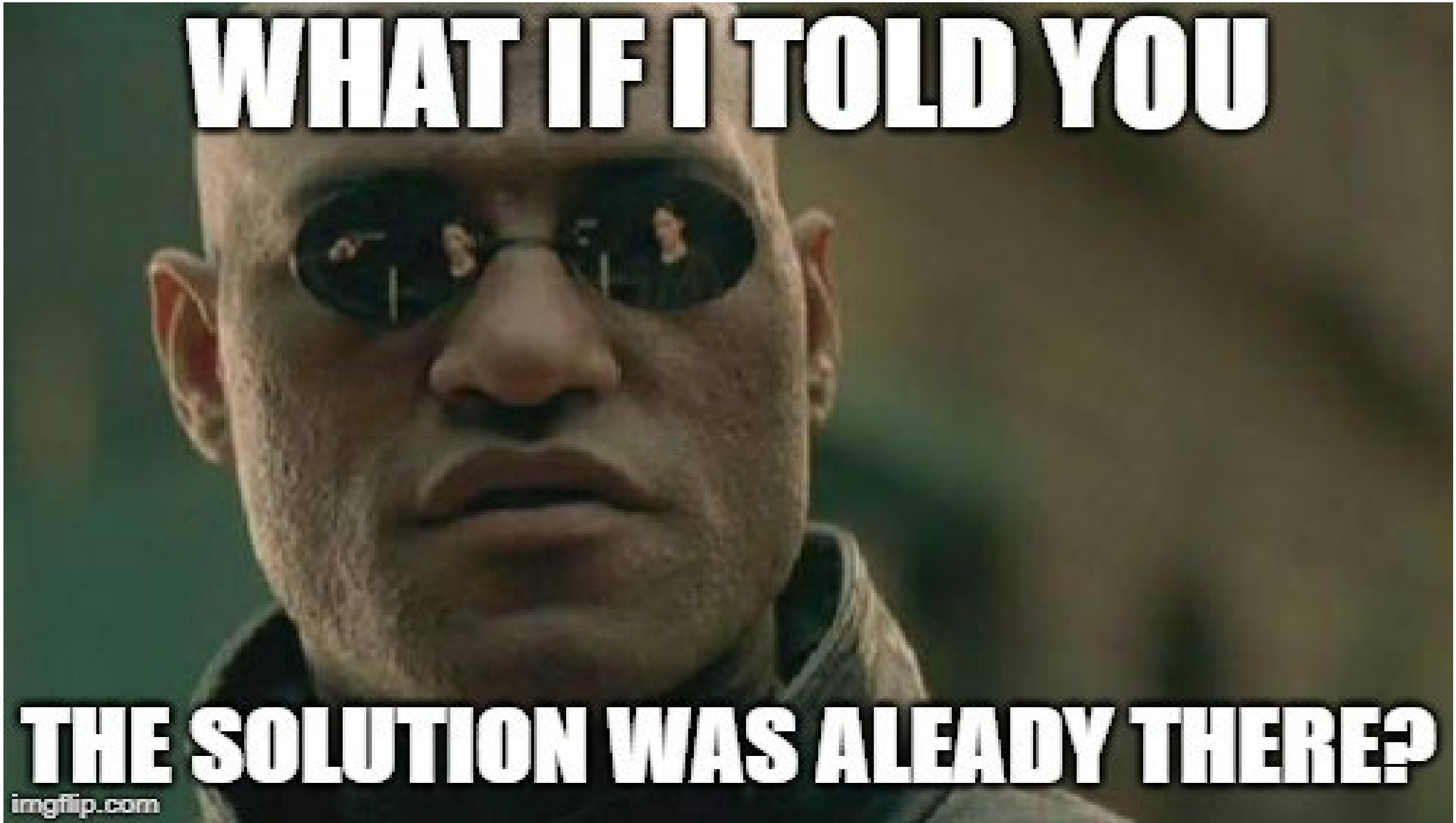
A Service Provider


WHAT IF I TOLD YOU
THE SOLUTION WAS ALEADY THERE?
imgflip.com

National Gap Analysis Program (GAP) | Land Cover Data Viewer

GAP HOME LAND COVER HOME Contact Us

Build a Map

Select a Land Cover Area

State: Oklahoma

County: [all counties]

- or -

LCC: [select an LCC]

Select NVC Level or Land Use Class

- Class
- Formation
- Macrogroup
- Ecological System

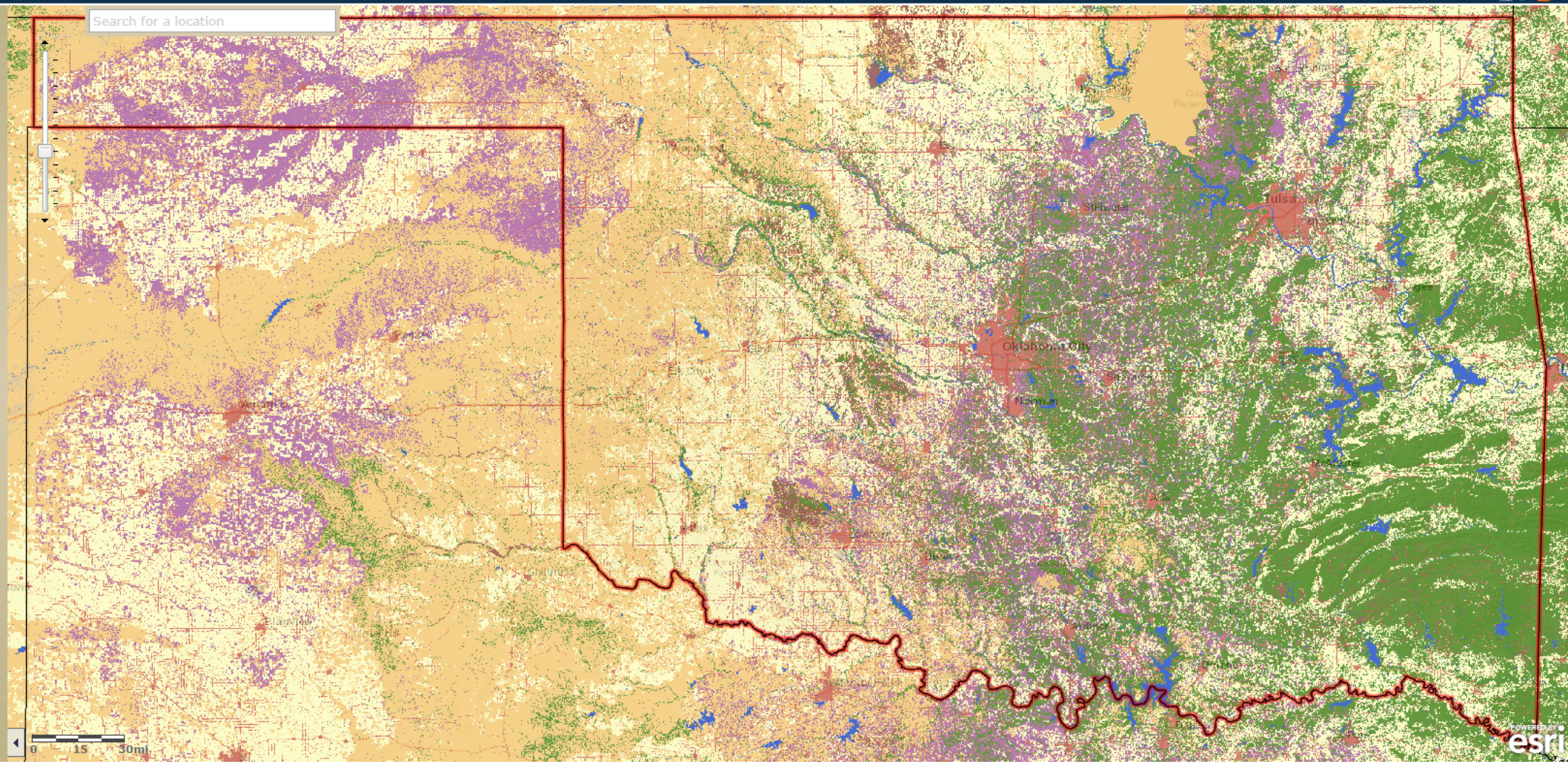
Please select a state or LCC to view Macrogroups and Ecological Systems.

Legend

- Forest & Woodland
- Shrubland & Grassland
- Semi-Desert
- Nonvascular & Sparse Vascular Rock Vegetation
- Agricultural Vegetation
- Developed & Other Human Use
- Introduced & Semi Natural Vegetation
- Recently Disturbed or Modified
- Open Water

Select a Base Map

- Streets
- Basic Reference
- Satellite
- USGS Topographic



Soil Health

what's underneath

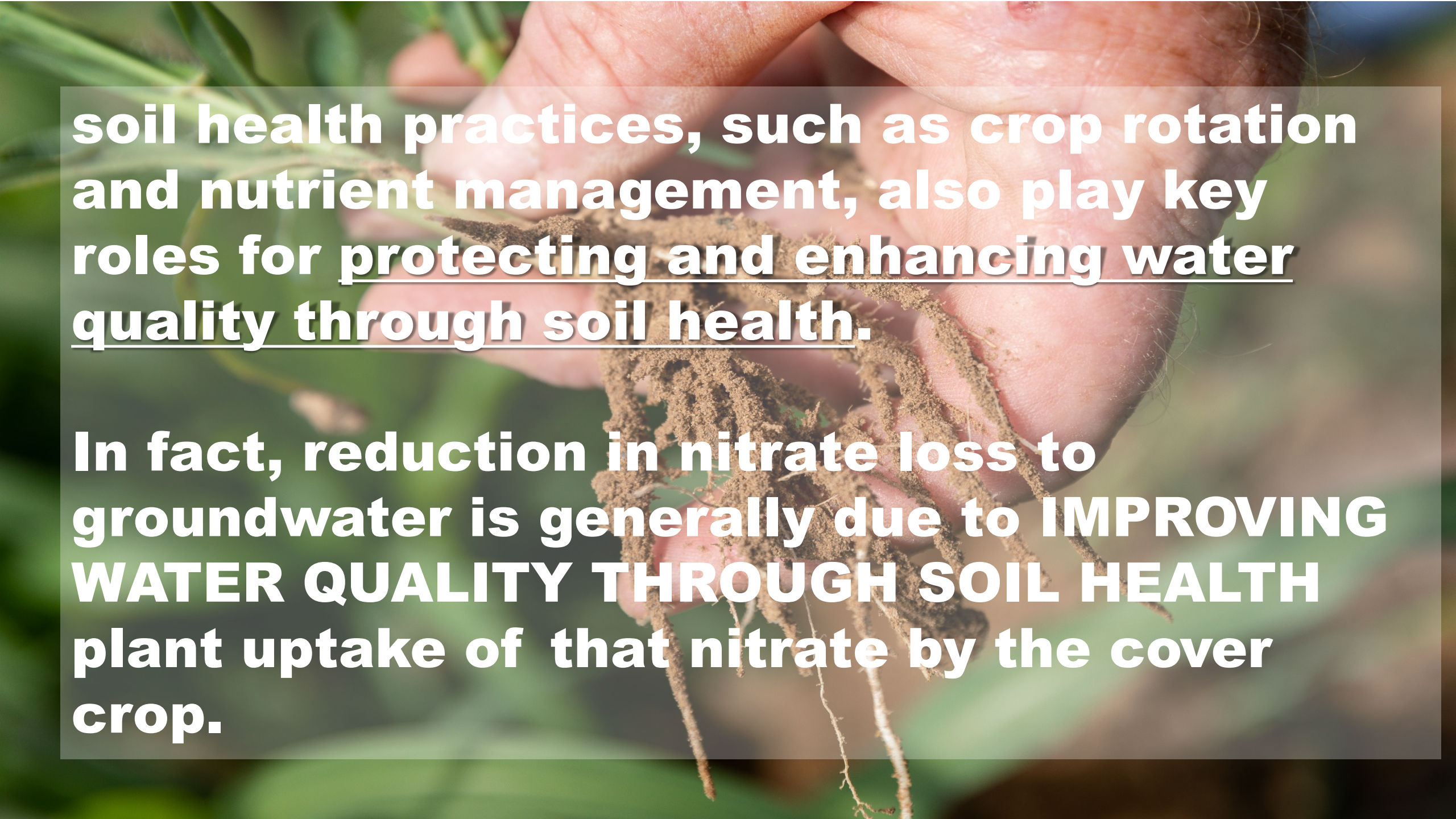
Healthy soil has amazing water-retention capacity.

Every **1%** increase in organic matter results in as much as **25,000** gal of available soil water per acre.

One teaspoon of healthy soil contains **100 million-1 billion** individual bacteria

All of the soil microbes in **1ac/ft** of soil weigh more than **2 cows**

Earthworm populations consume **2 tons** of dry matter per acre per year, partly digesting and mixing it with soil



soil health practices, such as crop rotation and nutrient management, also play key roles for protecting and enhancing water quality through soil health.

In fact, reduction in nitrate loss to groundwater is generally due to IMPROVING WATER QUALITY THROUGH SOIL HEALTH plant uptake of that nitrate by the cover crop.

what it does

Healthy soil is key to feeding **9 billion** by **2050**

Sources: Composition of soil: The Nature & Properties of Soils page 17 (Nyle Brady, Ray R Weil) | Water holding capacity: Kansas State Extension Agronomy e-Updates, Number 357, July 6, 2012 | Bacteria in a teaspoon: Soil Biology Primer page c-1 (Elaine Ingham, Andrew R. Moldenke, Clive Edwards) | Microbes weight:The Nature & Properties of Soil page 458 | Earthworm population consumption: Earthworms a Penn State publication by Sjoerd Duiker, Assoc. Prof. of Soil Management and Richard Stehouwer, Assoc. Prof environmental Soil Science | Feeding people: The United Nations | USDA is an equal opportunity provider and employer.

77,200 Farms/Ranches
34,000,000 acres

1%
850,000,000,000 available gallons today
ADD additional 8,500,000,000
THE SAMUEL ROBERTS
NOBLE
FOUNDATION
Noble Foundation
Attn: Ag Testing
2510 Sam Noble Pkwy,
Ardmore, OK 73401
NAME
ADDRESS

1.7
BILLION TONS OF TOPSOIL

lost to erosion each year in America

6
BILLION BENEFICIAL MICROORGANISMS

in a teaspoon of soil

1/5
OF GREENHOUSE GAS EMISSIONS

could be offset by global changes in farming practices

295
MILLION TONS OF SOIL PER YEAR

saved thanks to conservation programs in the Farm Bill

American Farmland Trust

System Resiliance

Strategies to address these opportunities:

SYSTEM RESILIENCE

- Increase drought resilience
- Increase temperature resilience
- Increase resistance to pests & pathogens
- Halt invasive species
- Develop more resilient soil/plant/animal Systems

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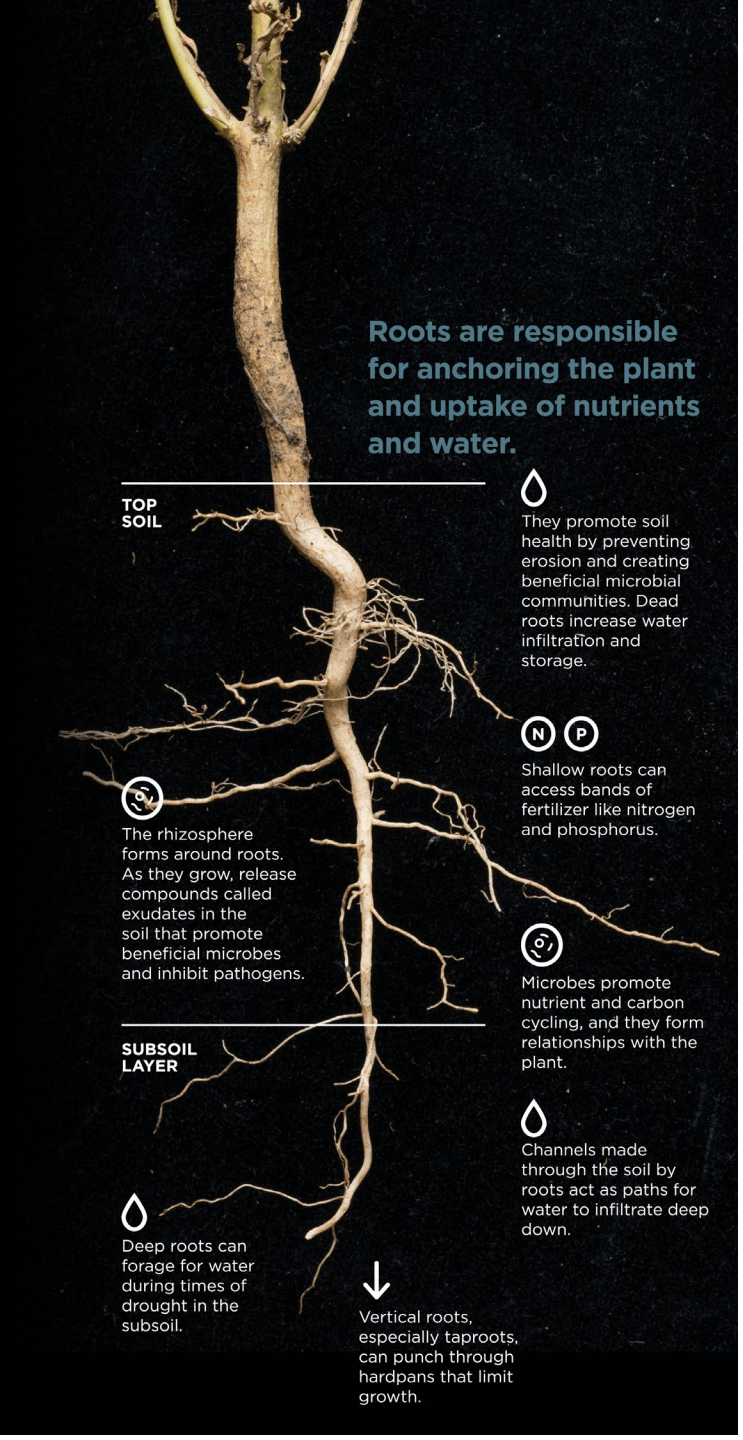
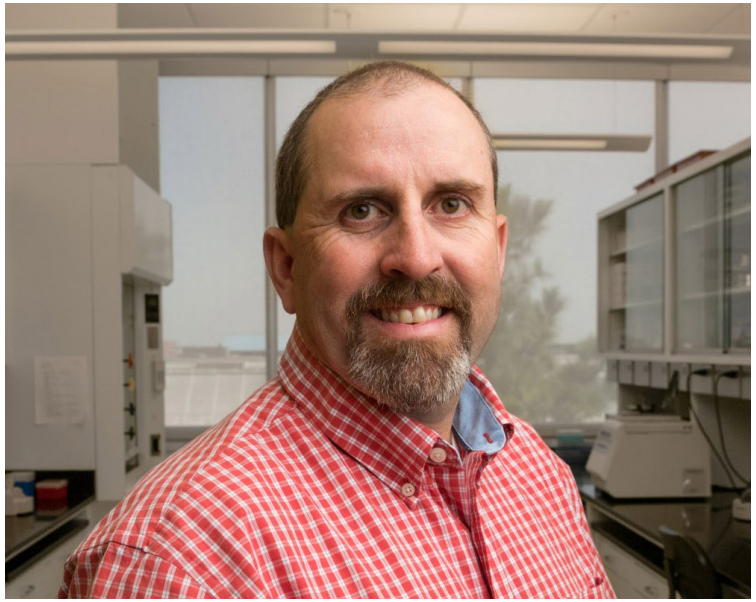
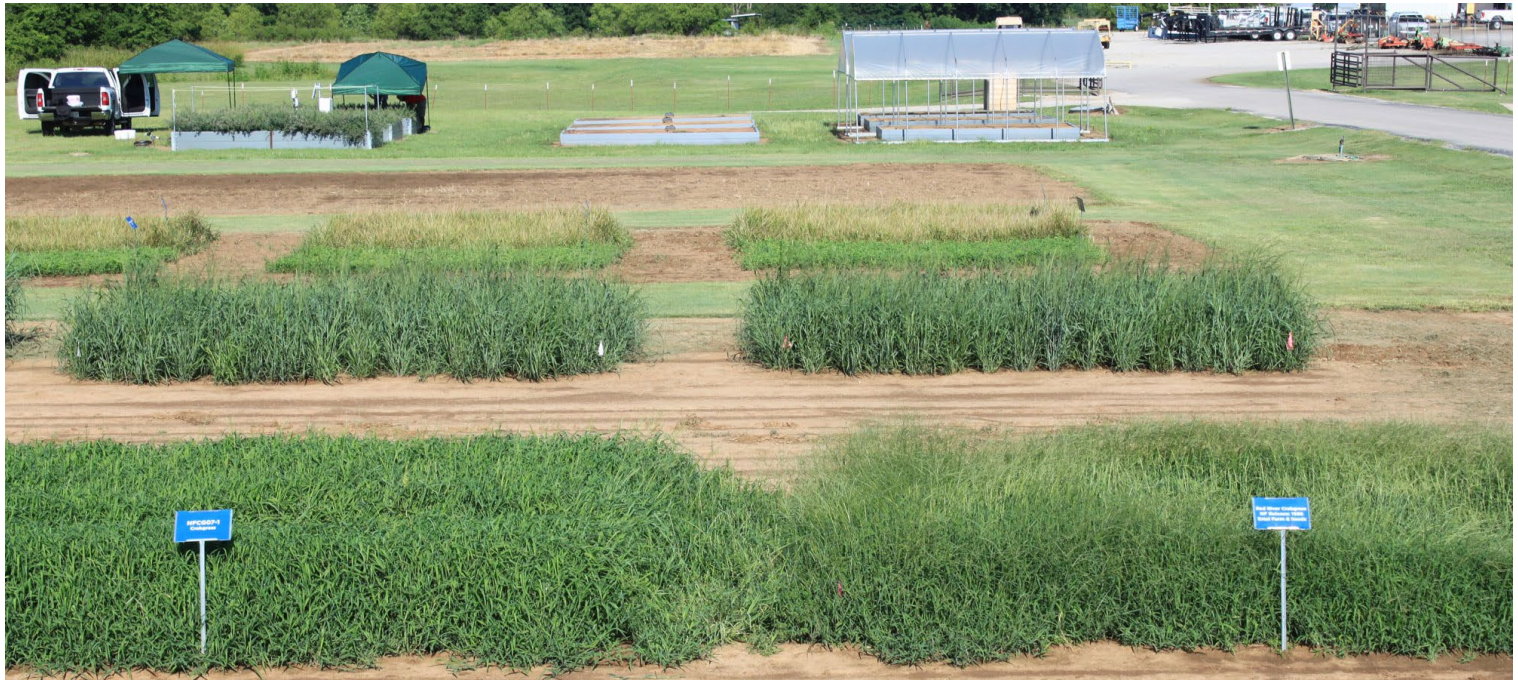
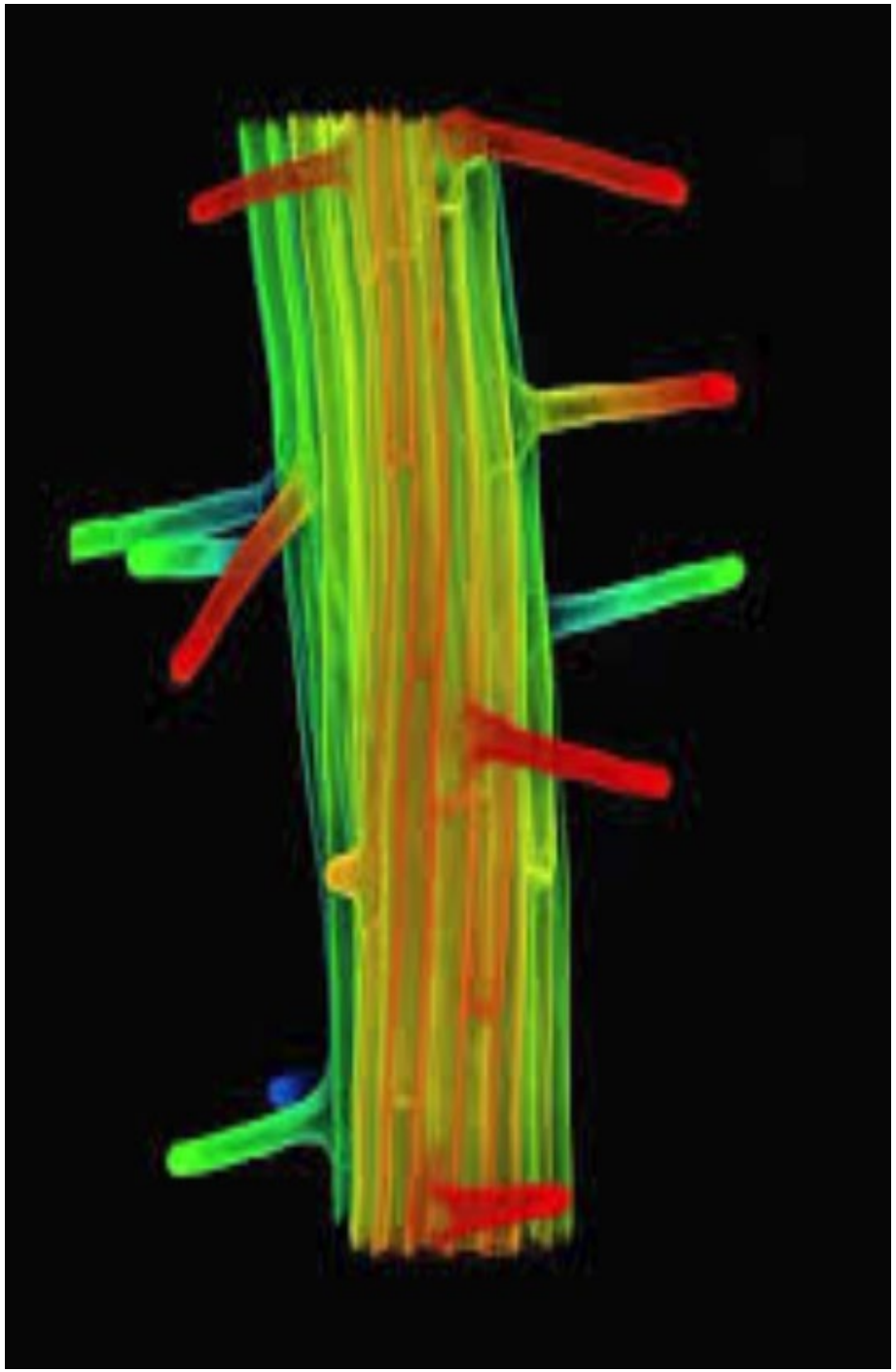


Larry York, Ph.D.
Assistant Professor

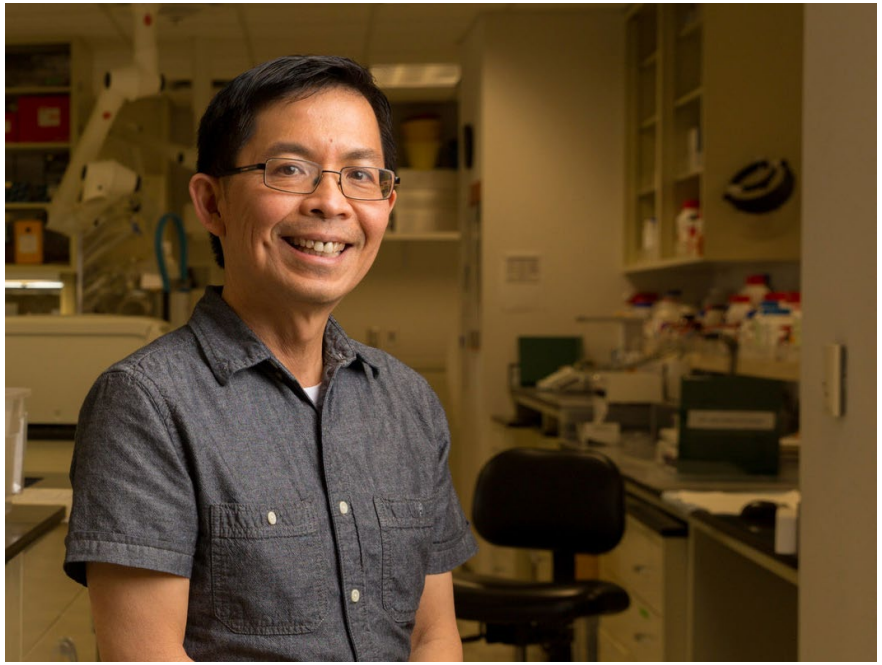
Mike Trammell
Senior Plant Breeder







Elison Blancaflor, Ph.D.
Professor



Cell Biology and Plant Development

Studies seek to learn more about the mechanisms that control root and shoot growth, seedling emergence, and light absorption for photosynthesis.

Learn more

Genomics

Programs encompass both the creation and use of a variety of research tools to explore and decipher the complexities of plant and microbe growth, development and function.

Learn more

Plant Breeding

A broad range of practices are used to create new varieties of plants with increased productivity or traits that provide value to agricultural production systems in the Southern Great Plains.

Learn more

Plant-Microbe Interactions

Researchers study viruses, fungal pathogens, endophytes and mycorrhizae, and how these microbes affect plant productivity, stress tolerance and disease resistance.

Learn more

Plant Nutrition

Studies seek a better understanding of the molecular and physiological mechanisms underlying how plants take up nutrients from the soil and use them to grow.

Learn more

Plant Physiology

Studies investigate the organism-scale biological processes crucial to plant growth and environmental response, a key to plant improvement.

Learn more

System Optimization

Strategies to address these opportunities:

SYSTEM OPTIMIZATION

- Improve management
- Enhance production efficiency
- Targeted livestock/forage systems
- Introduce technologies
- Diversify enterprises
- Test system components
- Combine components into systems
- Modeling for decision support
- Turn data into solutions

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