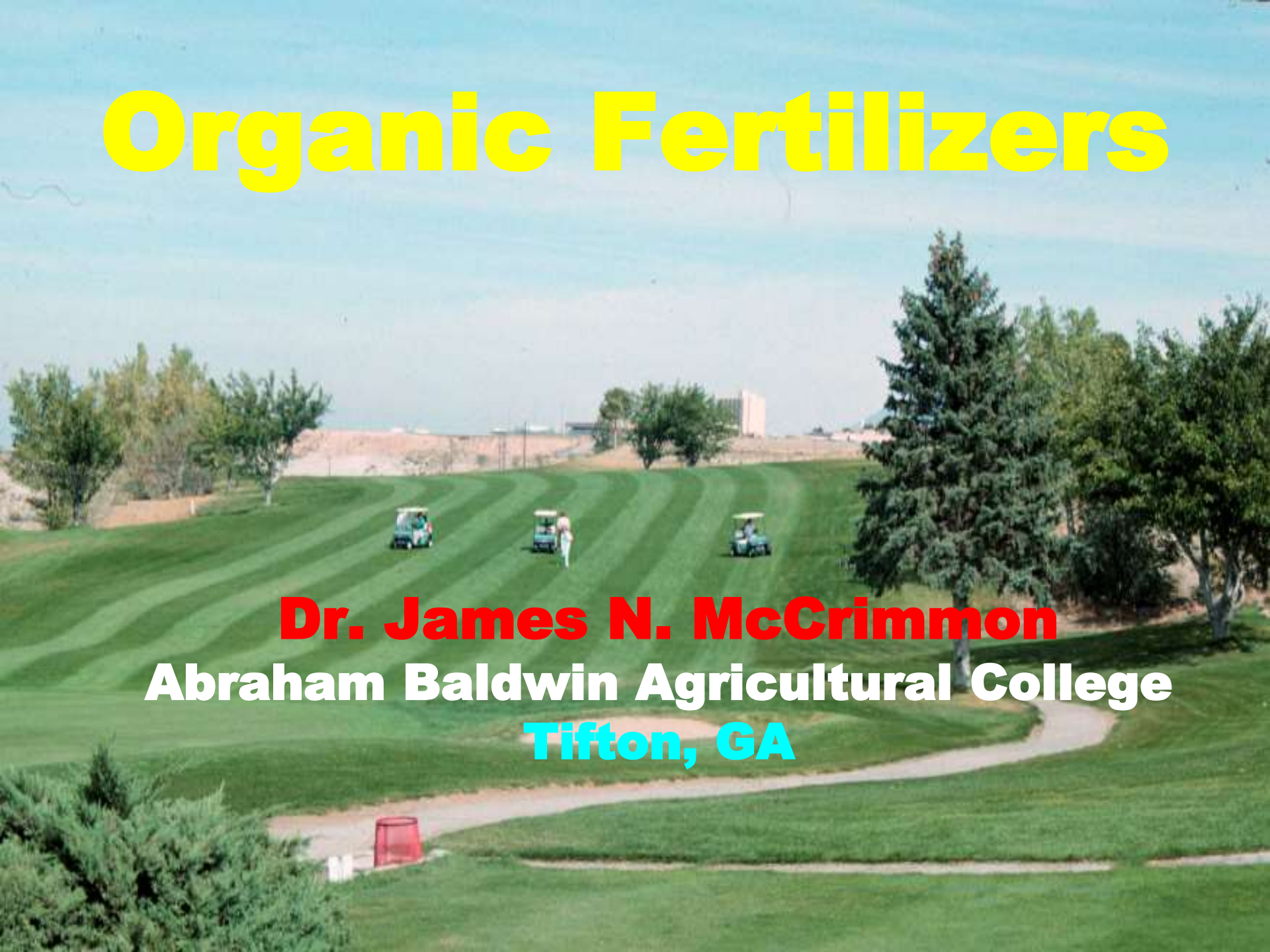
Organic Fertilizers



Dr. James N. McCrimmon

Abraham Baldwin Agricultural College

Tifton, GA

Why do we Fertilize?

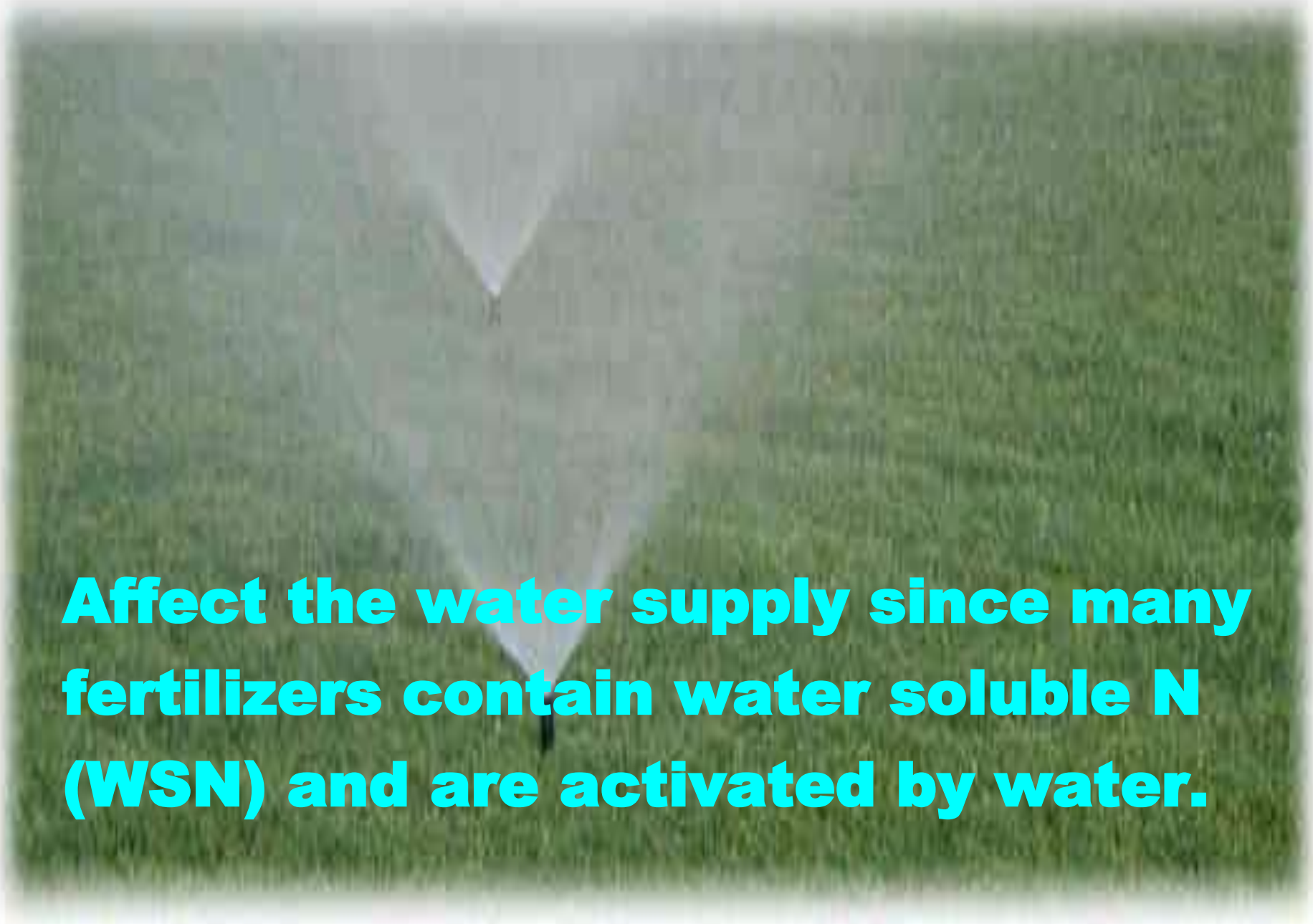
- To supply the essential nutrients to the turfgrass system.
- Usually not enough nutrients in the soil to provide good quality and healthy turf.
- To replace nutrients that have been depleted or lost.

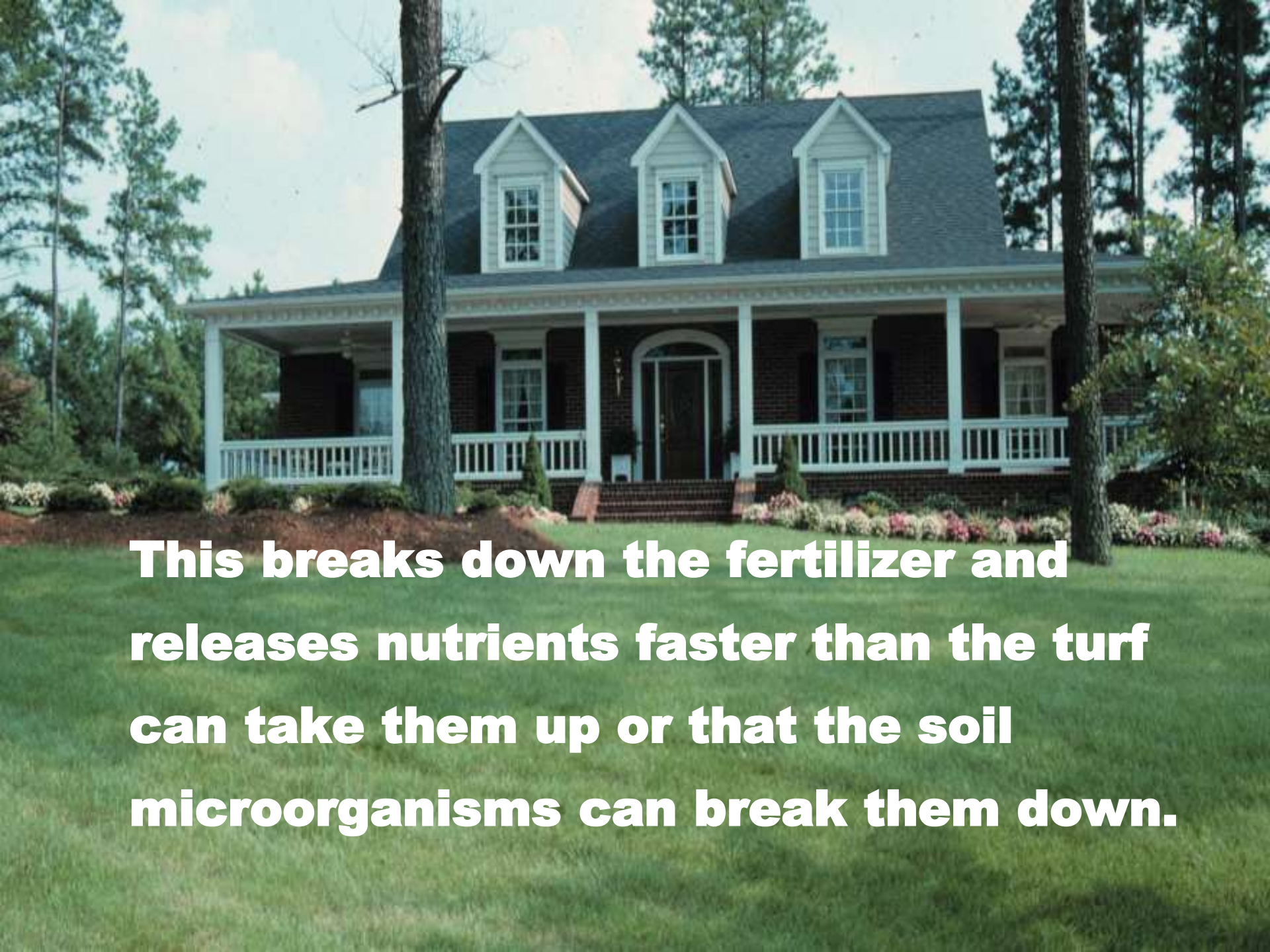
Fertilizers

- Concern over the use of synthetic or chemical fertilizers.

Fertilizers

They affect the health of pets, people, and the environment.


Affect the water supply since many fertilizers contain water soluble N (WSN) and are activated by water.


This breaks down the fertilizer and releases nutrients faster than the turf can take them up or that the soil microorganisms can break them down.


Leaching
Run off
Salts in soil

Organic Fertilizers

The materials of living organisms are composed of organic substances, carbon-containing compounds.

What does organic mean?

- Technically, organic refers to any substance that contains carbon.
- Both naturally occurring and man-made fertilizers may be organic.
- Natural refers to a product that is derived from animal, plant, or mineral sources (not man-made).

Fertilizer Sources

Organics

- Plant materials
- Animal materials
- Processed organics
- Synthetic organics

Inorganics

- Super phosphate
- Ammonium nitrate
- Ammonium sulfate
- Ammonium phosphate

Organic Fertilizers

Advantages

- Soil tilth improvement.
- Water holding capacity increased.
- Cation exchange capacity increased.
- Adds OM to the soil.

Disadvantages

- Low concentration of nutrients.
- More fertilizer required to apply certain amounts of nutrients.
- Some are expensive.

Inorganic Fertilizers

Advantages

- Higher nutrient concentrations.
- Smaller amount of fertilizer needed per nutrient provided.
- Ability to determine exact amount of nutrient provided.

Disadvantages

- Some are expensive.
- May burn turf if not used correctly.
- Leaching of nitrates into groundwater.
- May be toxic to people who apply them.

Organic fertilizer

Therefore, organic fertilizers generally refer to those that are derived from plant sources, animal sources, or treated sewage sludge.

Plant Materials

- Seed meals
  - Cotton
  - Soybean
- Green manures
  - Mustard
  - Vetch
  - Peas
- Straws
  - Cereals
  - Beans
- Forest products
  - Barks
  - Sawdust
  - Humus

Animal Materials

- Blood meal
- Bone meal
- Meat meal
- Fish meal
- Feather meal
- Poultry litter
- Tankage
- Hoofs and horns
- Manure
  - Solid
  - Liquid

Processed Organics

- Sewage sludge
- Processed crop residues
- Cannery wastes

Synthetic Organics

- Urea
- Urea formaldehyde
- Biuret
- Sulfur-coated urea


Types of organics
• Constructed
• Fortified
• Composted
• Activated sewage sludge

Constructed

- Feed grade quality meals (blood, bone, feather, fish, meat, and grain by-products).
- High in vitamins, minerals, sugars, starches, and carbohydrates which help stimulate soil microbes.
- Neutral pH, low salts, and high OM.

Fortified

- An organic fertilizer combined with a synthetic or chemical fertilizer.
- This offers a higher analysis than a natural organic fertilizer, alone.
- High amounts of WIN from the organic portion and high amounts of WSN from the synthetic portion.

Composted

- Contains animal manures and their bedding materials.
- Low analysis and high WIN product.
- N release is aided by soil microbes and adds OM to the soil.

Activated Sewage Sludge

- Contains human and/or industrial by-products.
- Uses screening, oxygenation, and very high temperatures to kill any pathogens.
- High in WIN; very low salt index; contains micronutrients such as Fe, Cu, and Zn.

Natural organic N carriers

Natural organic N carriers

Nitrogen contained in complex organic compounds that are not readily soluble in water (WIN).

Natural organic N carriers

Nitrogen release is dependent on soil:

microbes

temperature

moisture

Natural organic N carriers

- Low water solubility.
- Minimum foliar burn potential.
- Temperature-dependent; below 55° F (limited decomposition).

Natural organic N carriers

- Medium to slow release rate for N.
- Longer residual period of 4 to 8 weeks.

Natural organic N carriers

- High cost per unit of nitrogen.
- Minimal N loss by leaching and/or volatilization.

Natural organic N carriers

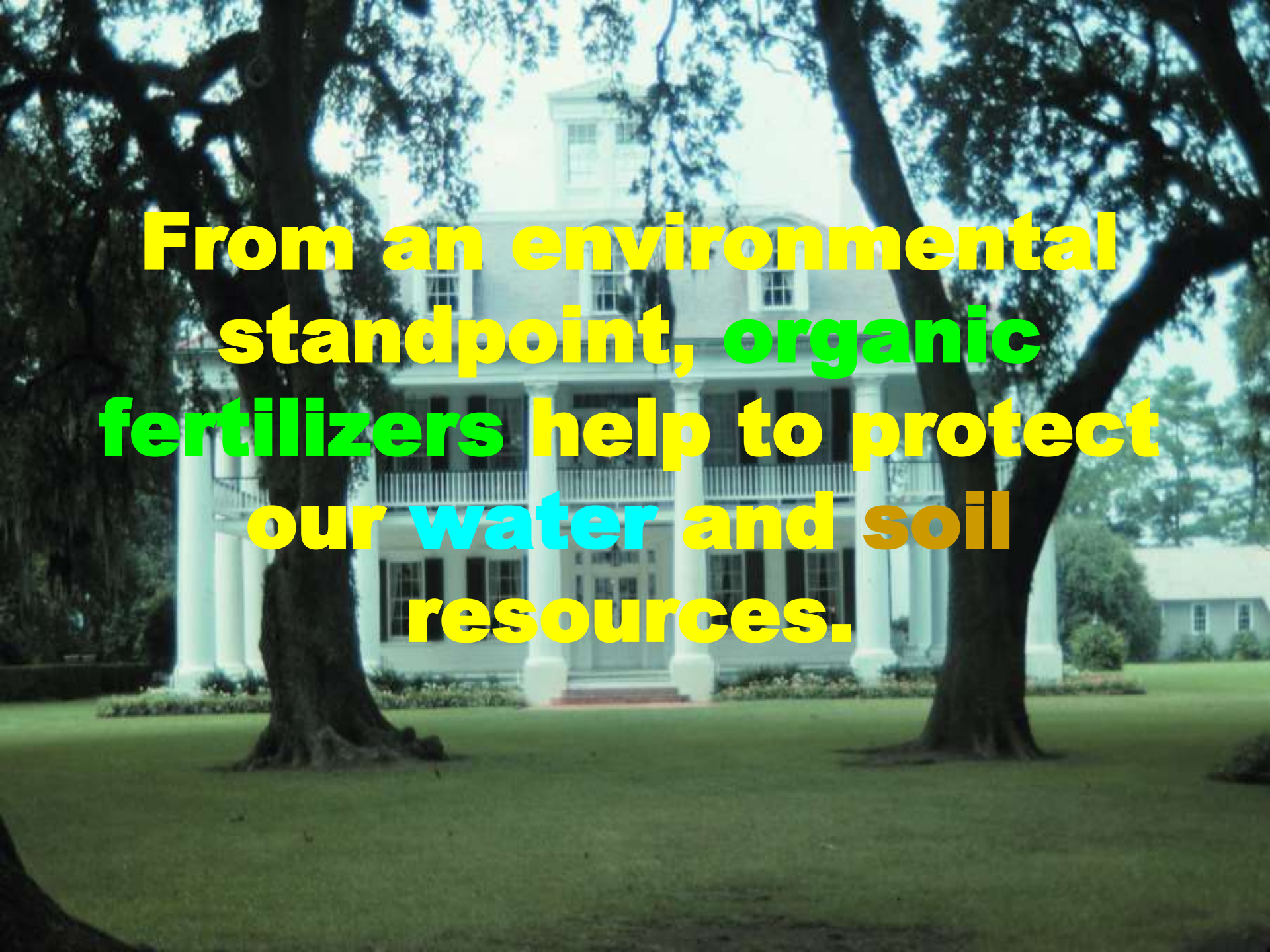
- WIN fertilizer that is slow release.
- Low salt index.
- May be used in hot weather.

Natural organic N carriers

- Most are enhanced with sugars, carbohydrates, fats, proteins, vitamins, and/or enzymes.
- These increase soil microbes.

Natural organic N carriers

- Contain organic matter which increases cation exchange capacity (CEC) and water holding capacity.


From an environmental standpoint, organic fertilizers help to protect our water and soil resources.

THE END

Fertilizers

They affect the health of pets, people, and the environment.