

# Impacts of Agriculture on Water Quality

Agriculture is the type of land use with the greatest impact on water quality and is the largest form of nonpoint source pollution.

3 Main Factors

1. Fertilizer
2. Livestock
3. Pesticides

## Fertilizer

Nutrients in fertilizers include nitrogen and phosphorus, primarily in the forms of ammonia, nitrates, and phosphates. When crops are sprayed shortly before a storm excess nutrients wash away and enter nearby waterways. This can result in:

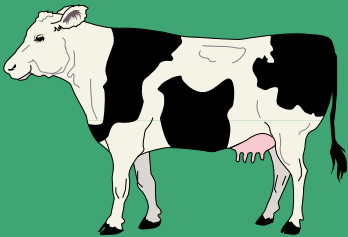
- **Eutrophication**, and the creation of **dead zones**, unsuitable for aquatic life.
- **Methemoglobinemia** (blue baby syndrome), a fatal disease in infants. Symptoms include weakness, nausea, elevated resting heart rate, and cyanosis.



## Livestock

Roughly 500 million tons of manure is generated each year from animal feeding operations

- Runoff from these areas can carry **pathogens** (bacteria, viruses, nutrients) to water sources impacting shellfish areas and water quality
- Groundwater can be contaminated by **waste seepage**
- Livestock can **overgraze**, increasing soil erosion, and damaging floodplain vegetation



## Pesticides

Includes insecticides, herbicides, and fungicides, all used to kill pests and protect crops.

- These chemicals kill fish and wildlife, harming communities, local ecosystems, and food web structure
- Pesticides contaminate drinking water
- Can lead to habitat loss when protective areas are destroyed or contaminated



# Best Management Practices (BMPs)

The common problem between each of the factors listed above is runoff. The pollutants are impacting water quality because they are reaching water ways. As a result, the solutions and best management practices are geared towards reducing chemical use and limiting runoff from agricultural areas.

## Crop Rotation

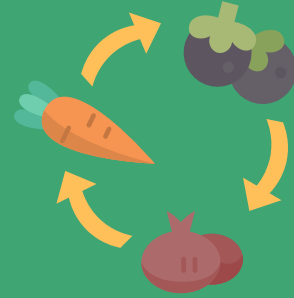
The practice of growing different crops in the same area through a sequence of growing seasons.

- It increases nutrient cycling and nutrient use efficiency, reducing the need for fertilizer
  - Decreases plant diseases and insect pests
  - Helps manage weeds
  - Increases soil health, reducing erosion

## Land Management

The following practices can be useful in minimizing soil erosion

- No-till farming
- Contour planting
- Grassed waterways
- Terracing soil
- Cover cropping



## Intercropping

A form of polyculture where multiple crops are grown in the same area. Specific crops are chosen that will grow well together because they have needs that compliment each other.

- Creates more resilient crops that are less affected by outside factors
- More economical because crop yields are higher
- Increased nutrient capture creates less runoff

## Livestock Management

Better management of livestock is needed to protect grazing areas and minimize manure and its pathogens entering nearby waterways. Practices include:

- Keeping animals out of sensitive areas and increasing intensity of grazing
- Increasing shady areas so grazing is more disbursed
- Prompt revegetation of affected area

## References

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