



South Dakota  
Soil Health Coalition

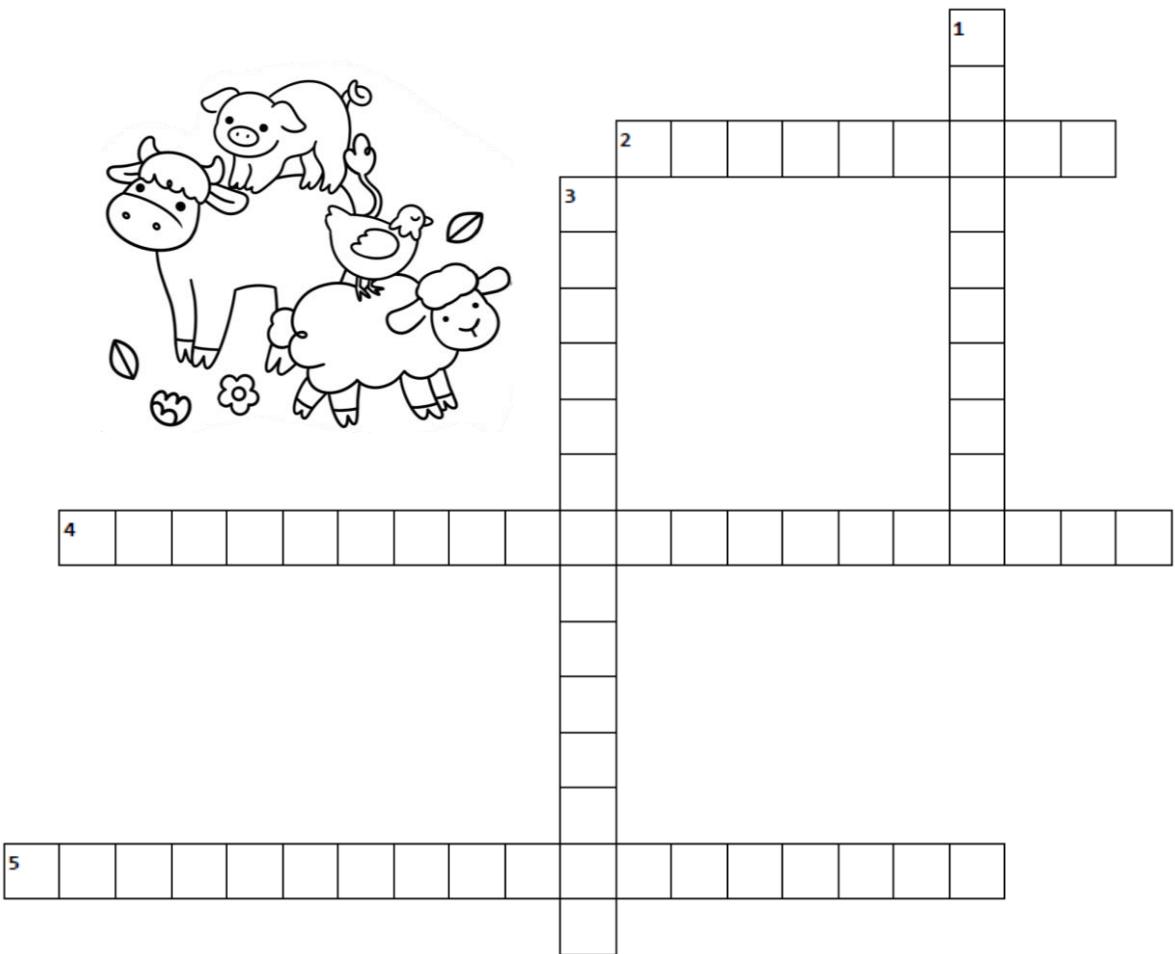
# SOIL HEALTH

## MIDDLE SCHOOL ACTIVITIES BOOKLET



# SOIL HEALTH PRINCIPLES

## CROSSWORD PUZZLE



**SOIL COVER**  
**LIMITED DISTURBANCE**  
**LIVING ROOTS**  
**PLANT DIVERSITY**  
**LIVESTOCK INTEGRATION**

# SOIL HEALTH PRINCIPLES

## CROSSWORD PUZZLE

### HINTS

#### ACROSS

**2**

Keeping plant residues  
on the soil surface to  
minimize erosion

**4**

Grazing of fall/winter  
cover crops to increase  
livestock nutrition,  
increase soil biological  
activity on cropland, and  
improve nutrient cycling

**5**

Minimizing physical,  
chemical, and biological  
disturbance to build soil  
aggregates, pore spaces,  
soil biology, and organic  
matter

#### DOWN

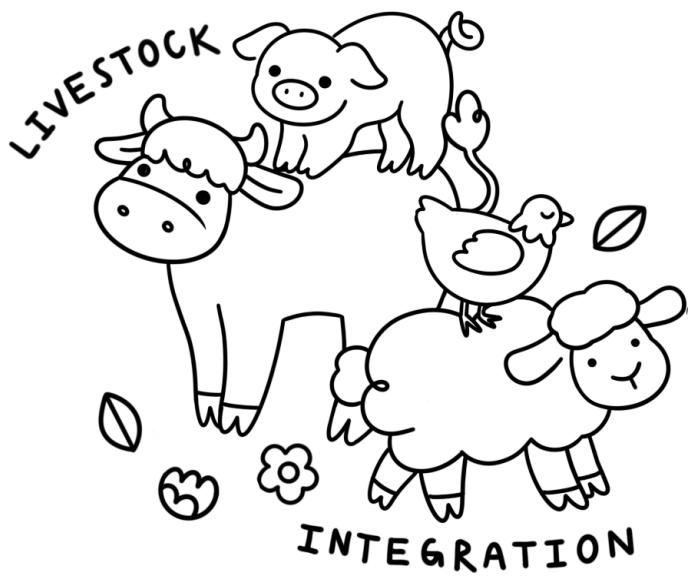
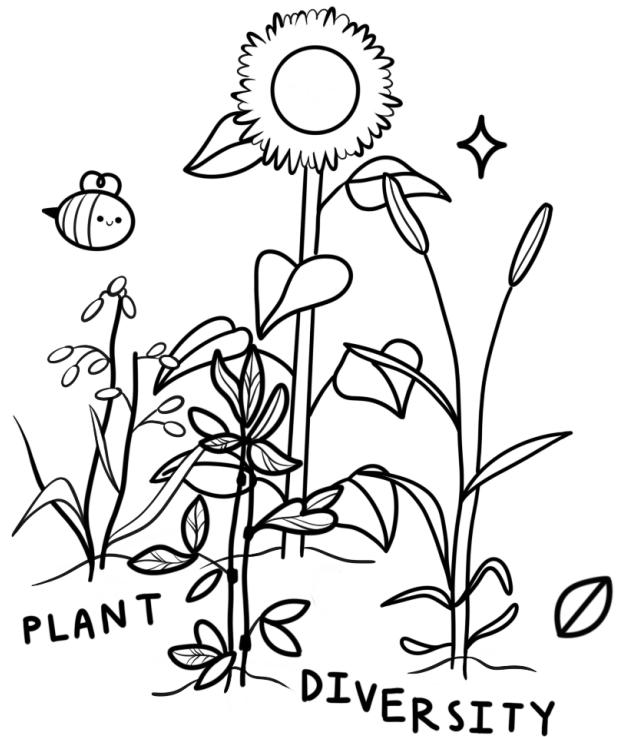
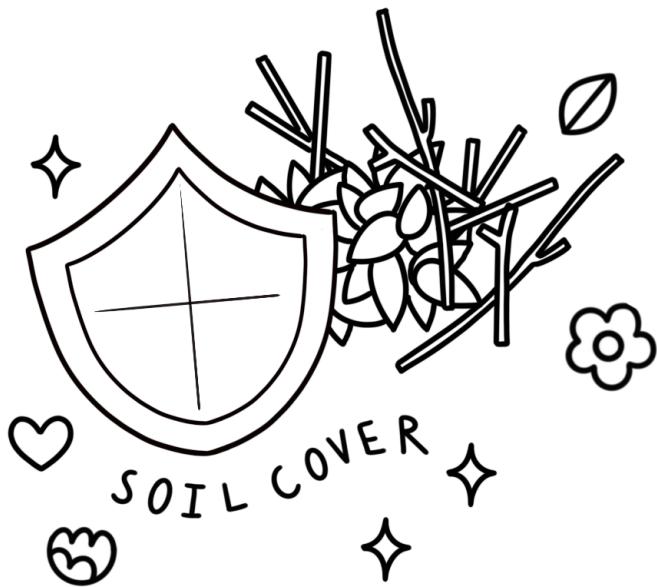
**1**

Keeping plants growing  
throughout the year to  
sequester carbon and  
feed the soil

**3**

Using cool and warm  
season grasses and  
three or more crops and  
cover crops in rotation  
to mimic nature

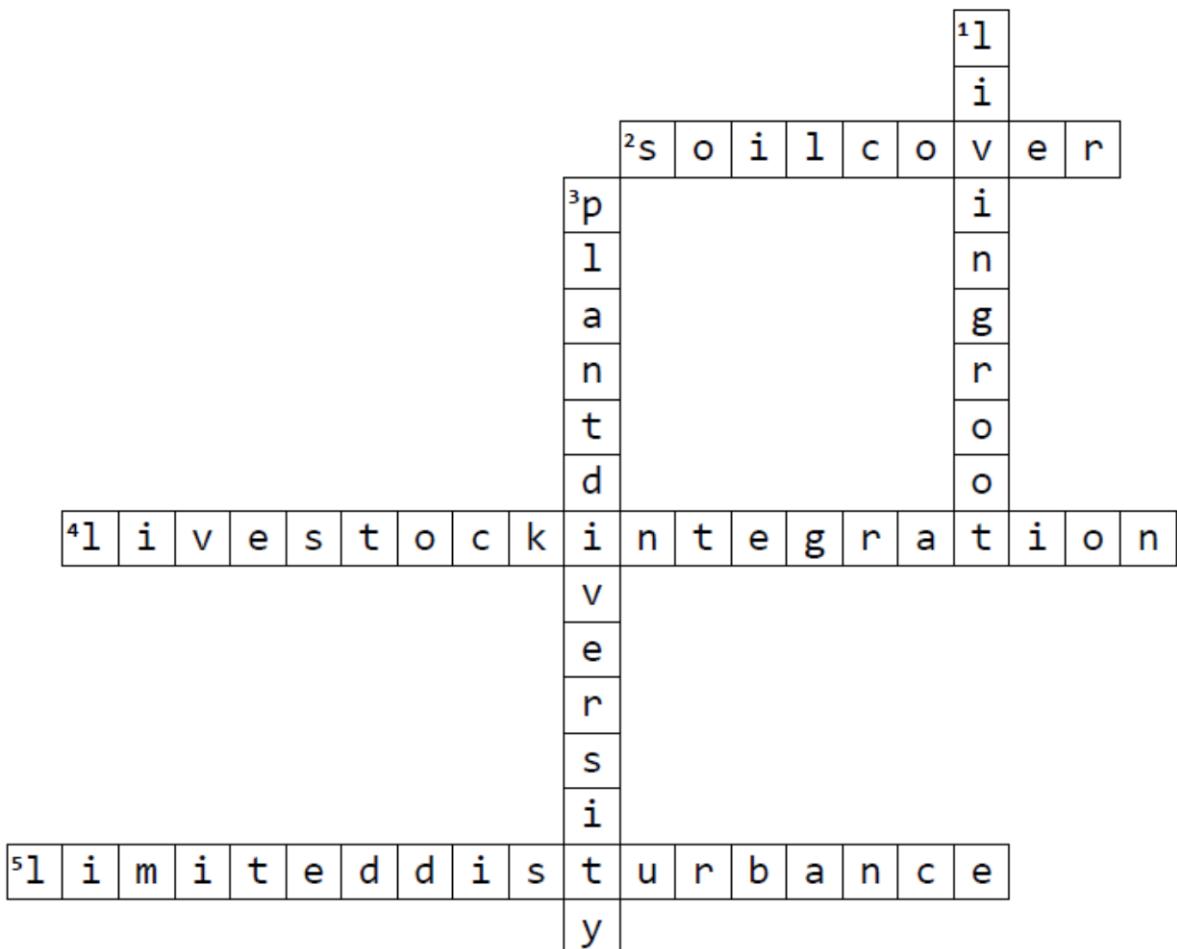
# SOIL HEALTH PRINCIPLES



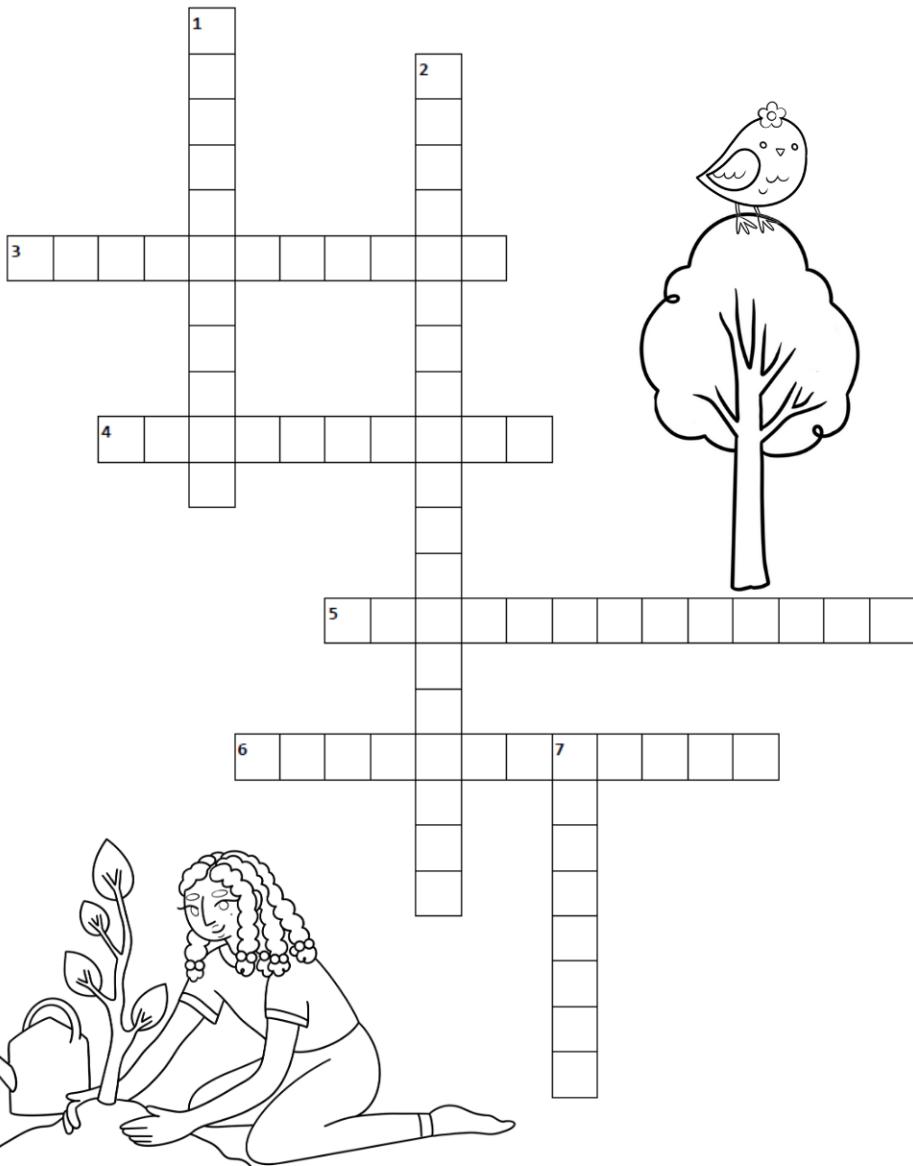
# SOIL HEALTH PRINCIPLES

## CROSSWORD PUZZLE

ANSWER KEY



# AGRONOMY CAREERS CROSSWORD PUZZLE



FARM MANAGER   FOREST SOIL SCIENTIST  
SEED ANALYST   CLIMATOLOGIST  
ENGINEER        PLANT BREEDER  
SPECIALIST

# AGRONOMY CAREERS CROSSWORD PUZZLE

## ACROSS

**3**

Evaluates seed samples for purity, variety, and germination

**4**

There are several types including Crop Production, Fertilizer, and Soil Management

**5**

Studies climate change, climate variability, and the effects of climate on the biosphere and makes predictions using computer models

**6**

Studies seed characteristics and works to improve the characteristics that are most desirable for a plant

## DOWN

**1**

Runs complex agricultural businesses and uses market condition, disease, and soil to decide how to raise crops

**2**

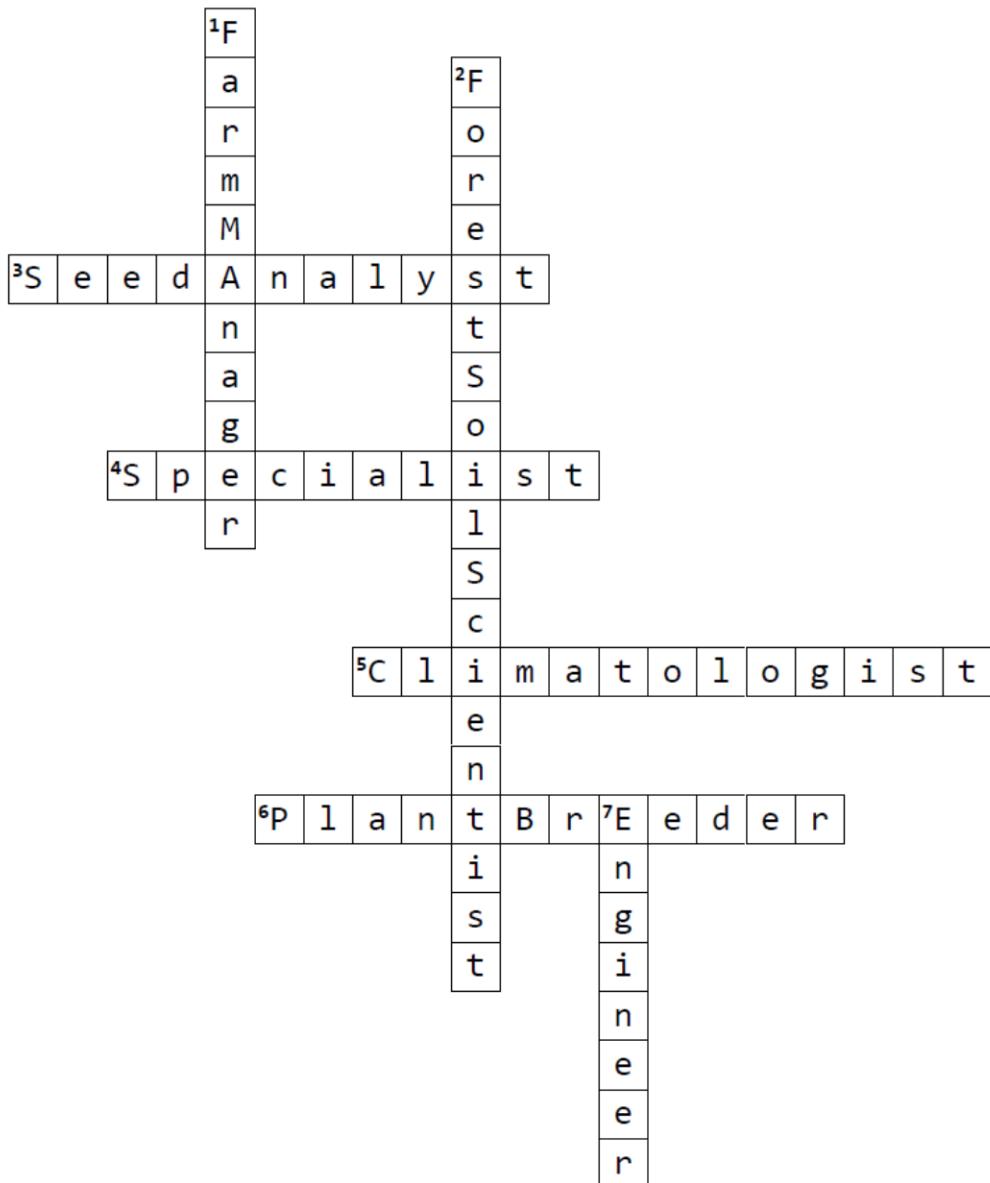
Analyzes characteristics of forest soil and researches the ability to survive in differentiated conditions.

**7**

There are several types related to agronomy including Biological, Environmental, and Agricultural

# AGRONOMY CAREERS CROSSWORD PUZZLE

## ANSWER KEY

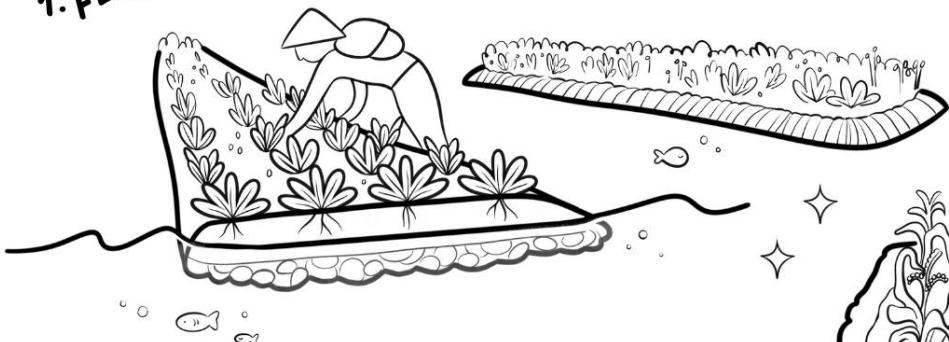


# INDIGENOUS FARMING PRACTICES

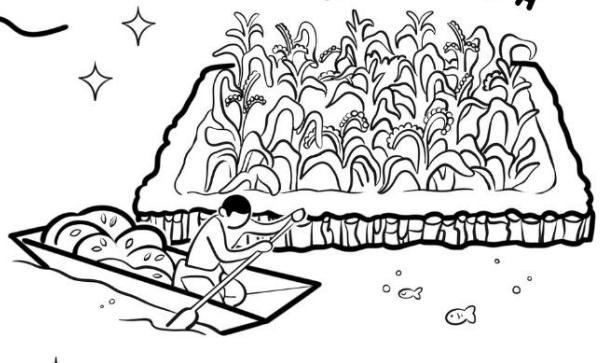
**LABEL THE DESCRIPTIONS BELOW WITH THE CORRECT NUMBER**

- A technique used in mountainous regions, such as the Andes Mountains in Peru. Indigenous peoples built these along steep slopes to create flat areas for cultivation. They help prevent soil erosion, retain water, and maximize arable land. Potatoes, quinoa, and maize were commonly grown using this method.
- A farming system practiced in Mesoamerica, including Mexico and Central America. It involves intercropping *the three sisters*: maize, beans, and squash. Maize provides a structure for the beans to climb, beans fix nitrogen in the soil, and squash provides ground cover to suppress weeds and retain moisture.
- An approach practiced in the Amazon Rainforest that involves growing multiple crops together in a diverse and integrated system. Fruit trees, medicinal plants, and root vegetables are planted together to promote ecological resilience, soil fertility, and pest control.
- Artificial islands or floating gardens built on shallow lakes and wetlands, primarily used for agriculture by the Aztec civilization in ancient Mexico. These were constructed by weaving together layers of aquatic plants and soil to create fertile beds for growing crops.
- A terracing technique used in the Mediterranean region of Europe where farmers built stone walls on hilly or rocky terrain to help retain soil, prevent erosion, and create microclimates for cultivating crops like olives, grapes, and citrus fruits. They also serve as habitat for biodiversity and cultural landmarks.
- A traditional rice cultivation approach used in Southeast Asia, such as the Philippines, Indonesia, and Thailand, that is adapted to local landscapes and water systems. It was developed to optimize water management, soil fertility, and crop resilience in diverse environments.

### 1. FLOATING RICE



### 2. CHINAMPA



### 3. TERRACE FARMING



### 4. MILPA AGRICULTURE



### 5. DRY STONE WALLING



### 6. POLYCULTURE & AGROFORESTRY



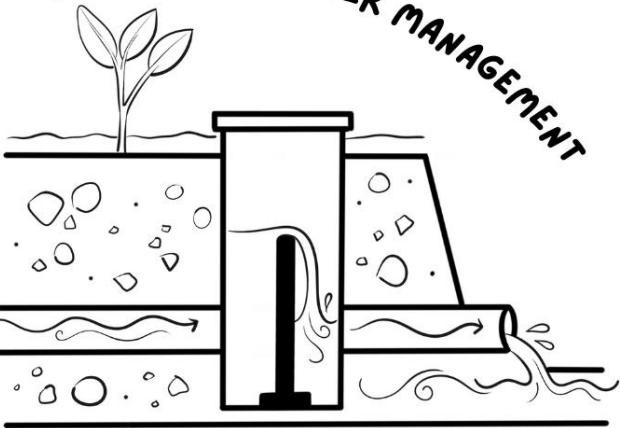
# SOIL CONSERVATION PRACTICES

**LABEL THE DESCRIPTIONS BELOW WITH THE CORRECT NUMBER**

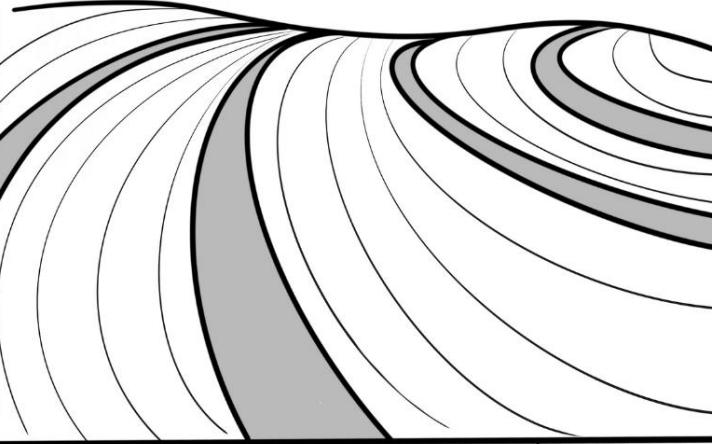
- Shallow pools that filter sediment, nitrate, and other nutrients and also provide flood mitigation and habitat benefits. They can be specifically designed to intercept drainage tiles to treat water before releasing it back into a tile line, ditch, or stream.
- A line of prairie plants planted in-between row crop or along streams and waterbodies that aids in reducing erosion and nutrient runoff, increasing habitat and food sources for wildlife, and stabilizing stream banks
- A practice that provides living roots throughout much of the year which absorbs nutrients and prevents loss. They are planted in addition to a cash crop in order to gain environmental and economic benefits.
- A technology where water control structures are added to existing tile networks to raise or lower the water table to a desired elevation depending on crop needs and helps farmers control the amount and timing of water leaving fields.
- An edge of field practice that filters drainage tile water through woodchips to remove nutrients and protect water quality. This removes nitrate-nitrogen from tile water and does not impact in-field management.
- A technology that allows farmers to pass drainage tile water through perennial vegetation to reduce nutrient loss to local waterbodies. It does not impact cash crops, takes very little land out of production, and has water quality and habitat benefits.



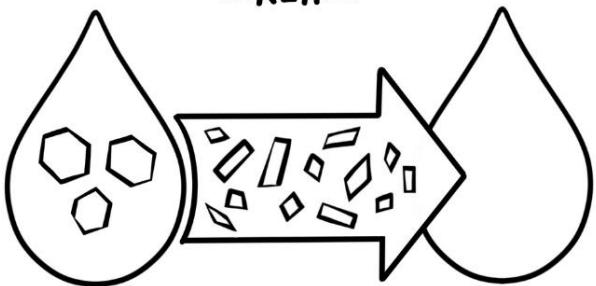
2. DRAINAGE WATER MANAGEMENT



4. PRAIRIE STRIPS



5. BIOREACTORS



6. WETLANDS

