

**TITLE:** Introduction to Sustainable Agriculture and Food Systems

**OBJECTIVES:**

- To introduce the principles of sustainable agriculture and how they are used on the farm.
- To introduce the terms “industrial/global” and “sustainable/local” agriculture.

**TIME REQUIRED:** 1.5 - 2 hours

**PREPARATION:** Print out the Scavenger Hunt Station Cards. Attach each of these to a stake and place them around the farm in the appropriate spot (compost pile, cover crop, field where corn was grown last year, roots and greens field, field with a variety of weeds, field with insects).

**MATERIALS:** compost thermometer, cups for collecting insects, Scavenger Hunt station cards, stakes, pencils, flip chart, markers, answer sheets for Scavenger Hunt, Agricultural Terms and Soil Management Options sheets, Copies of Ag Workshops, Farm Description sheets.

**DIRECTIONS:**

Activity 1: Agricultural Terms and Soil Management Options (20 minutes)

Start by put the words “sustainable” and “conventional” methods on the flip chart. Brainstorm ideas then synthesize those that seem to fit the best.

Now introduce the terms “industrial/global” and “sustainable/local”. These terms represent food systems on opposite ends of the spectrum. While there are many configurations of food systems that exist between these two extremes (for instance local conventional or large-scale organic), we will focus on these because the costs and benefits are more easily delineated than when using the terms conventional or sustainable food system. Get agreement from the group on what these terms mean.

**List the terms from the Agricultural Terms and Soil Management Options** sheet on a flip chart. Ask the group to come up with a working definition of each. Ask someone to tell the group what are the benefits of each of the practices and what are the concerns. What are alternative practices used on industrial farms? Suggest that the leaders take notes because they may want to use them during the next activity.

Activity 2: Scavenger Hunt (30 minutes)

Divide participants into pairs and hand each pair an answer sheet, a pencil, and insect collecting cups. They have 15 minutes (they may need more depending on how far apart the stations are) to complete the scavenger hunt. The questions are all located on stakes at six stations placed throughout the farm. Send each group off in a different direction to begin. Ring the bell when time is up. Bring everyone back together and discuss the answers. Tie the results back in to the concepts on the definition sheet.

Activity 3: Soil Management Options (20 minutes)

Distribute an Agricultural Terms and Soil Management Options Sheet to everyone. Divide participants into three groups. Ask them to imagine that they are the owners and operators of three different farms. The success of each farm depends on the health of the soil. Using what they have learned in this workshop, what agricultural practices would they propose to use to manage the



health of their land. They should work in groups for 10 minutes and then report back to the larger group. Hand out one Farm Description sheet to each group.



## SCAVENGER HUNT STATION CARDS

### STATION 1

1. IDENTIFY 5 INGREDIENTS IN THE COMPOST PILE.
2. WHICH PART OF THE PILE IS THE HOTTEST? WHAT IS THE TEMPERATURE? WHY?
3. ON AN INDUSTRIAL FARM WHAT WOULD A FARMER ADD TO THE SOIL TO ENHANCE PLANT GROWTH?

### STATION 2

1. BEFORE YOU, YOU CAN SEE ONE EXAMPLE OF A COVER CROP (RYE). WHEN WAS THIS COVER CROP PLANTED? HOW LONG WILL IT BE HERE?
2. IF WE DIDN'T PLANT A COVER CROP, WHAT COULD HAPPEN TO THE SOIL DURING THE WINTER?
3. THERE ARE 6 TYPES OF COVER CROP USED ON THIS FARM. COLLECT ONE OTHER TYPE OF COVER CROP AND BRING IT BACK.

### STATION 3

1. FIND ONE BENEFICIAL INSECT AND ONE INSECT PEST (OR SIGN OF PEST DAMAGE) IN THIS FIELD. COLLECT THEM AND BRING THEM BACK WITH YOU.
2. LOCATE A PLANT THAT IS POLLINATED BY AN INSECT. WHAT IS IT?



3. HOW CAN WE GET RID OF THESE INSECT PESTS? HOW WOULD INSECTS BE CONTROLLED ON AN INDUSTRIAL FARM?

#### **STATION 4**

1. NAME THREE WAYS TO WEED THIS FIELD.
2. WHY ARE WEEDS HARMFUL TO PLANT GROWTH?
3. HOW WOULD WEEDS BE CONTROLLED ON AN INDUSTRIAL FARM?
4. BRING BACK A WEED THAT SPREADS BY SEED AND ONE THAT SPREADS PRIMARILY BY ROOTS.

#### **STATION 5**

1. WHAT IS THIS FIELD AN EXAMPLE OF? (HINT: USE ONE OF THE TERMS THAT WE DEFINED EARLIER.)
2. IDENTIFY 4 CROPS GROWING HERE.
3. NAME ONE BENEFIT OF PLANTING THESE CROPS TOGETHER.
4. BRING BACK 4 DIFFERENT PLANT PARTS THAT ARE EDIBLE. (YOU CAN LOOK IN OTHER FIELDS AS WELL.)

#### **STATION 6**

1. WHAT WAS GROWN ON THIS FIELD LAST YEAR?
2. NAME TWO THINGS THAT WOULD HAPPEN IF WE PLANTED THE SAME CROP HERE EVERY YEAR?

3. HOW WOULD AN INDUSTRIAL FARMER THAT ONLY GROWS CORN DEAL WITH THESE PROBLEMS?
4. BRING BACK A PLANT THAT GROWS IN THE SAME PLACE EVERY YEAR.



# AG TERM SCAVENGER HUNT – ANSWER SHEET

## STATION 1

1. a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_

2. Hottest Part? \_\_\_\_\_ Temperature? \_\_\_\_\_  
Why? \_\_\_\_\_

3. \_\_\_\_\_

## STATION 2

1. When? \_\_\_\_\_ How long? \_\_\_\_\_
2. \_\_\_\_\_
3. Name the cover crop you bring back, if you can \_\_\_\_\_

## STATION 3

1. Identify or describe:

Beneficial \_\_\_\_\_

Pest or Damage \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

## STATION 4

1. a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_



2. \_\_\_\_\_

3. \_\_\_\_\_

**STATION 5**

1. \_\_\_\_\_

2. a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

3. \_\_\_\_\_

**STATION 6**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_



**This is a description of your farm. Think about what soil management decisions would be appropriate given these conditions.**

A few things to remember: soil life needs air, water, and food (organic matter) to stay alive, and these are provided by the soil structure (sandy soil = more air; clay soil = more water; lots of organic matter = lots of food, water, and air). A mixture of all these soil components is ideal. Healthy soil life = healthy plants = healthy people. Erosion occurs on steep or gentle slopes and can wash away tons of valuable topsoil each year. Fertilizer runoff is a problem in areas with lots of rain and steep slopes. Every farm has a limited budget, and costs need to be considered.

You have a 50-acre mixed vegetable farm in the state of Washington. The farm has been in your family for 100 years and is used intensively with all 50 acres in vegetable production. However, the soil has been taken care of and is pretty fertile (good soil nutrients). The soil is heavy clay, and you live in one of the wettest regions of the U.S. You are located in a flat river valley.

**Management plan:**





## Agricultural Terms and Soil Management Options

### Cover cropping

*Description:* Mixing vegetables with other crops like grasses and legumes (plants that add nitrogen to the soil) instead of just growing vegetables. Cover crops are incorporated into the soil to break down and add nutrients; cover cropping is done during the spring, summer, fall and winter with different crops that are well suited to each season and add different nutrients to the soil.

*What it does:* Adds organic matter to the soil, which helps hold moisture and lighten the soil texture, adds nutrients to the soil; prevents soil erosion through the action of its roots holding soil in place.

*Concerns:* Growing cover crops instead of cash crops (vegetables) means you have to grow on more land to make the same amount of money.

### Organic fertilizer

*Description:* Fertilizer made from various natural sources including bone meal, blood meal, cottonseed meal, greensand, and rock phosphate.

*What it does:* Provides plants with specific nutrients they need to grow well in a readily available, slow-release form (longer-term).

*Concerns:* Energy-intensive process to produce it, require lots of fossil fuels; over-fertilizing can cause fertilizer runoff from the farm into the watershed (rivers, lakes) when there's heavy rain; this can result in nutrient overloads that harm the environment and people; more expensive than conventional fertilizer.

### Conventional (chemical) fertilizer

*Description:* Fertilizer made through a synthetic process from fossil fuels.

*What it does:* Provides plants with some of the nutrients they need to grow in an immediate release form (short-term)

*Concerns:* Same as organic fertilizer but more likely to cause nutrient overloads because of its immediate-release form; normally contains only nitrogen, phosphorous and potassium, which are not the only nutrients plants need to grow; needs to have water (from rain or irrigation) to be activated.

### Composting

*Description:* Building piles with various ingredients including manure, straw, wood chips, lawn clippings, and food scraps/ by-products, and allowing them to decompose to form a nutrients-rich organic matter called humus, which is spread over fields.



*What it does:* Provides nutrients for plants in a stable form and organic matter, which helps the soil hold moisture; recycles products that would otherwise be waste for a landfill.

*Concerns:* Need to make sure ingredients are mixed in proper proportions so they will decompose well; need reliable sources of materials that are not contaminated; adding too much organic matter can actually decrease the amount of nutrients available in the soil because they are tied up in the process of decomposition.

### **Crop rotations**

*Description:* Planting crops in a rotation where one crop will never be grown on the same piece of land for more than one year (example: planting beans in a field one year, followed by corn the next, followed by lettuce the next.)

*What it does:* Certain crops take lots of nutrients from the soil while other take very little or even add nutrients to the soil; rotations allow for crop vegetables to help fertilize each other by planting a crop that gives a lot of nutrients the year before one that takes a lot of nutrients. Crop rotation also helps control pest infestations.

*Concerns:* Crop rotation means a farm must be diverse with many different crops. This means the farm can not specialize in only one thing.

### **Beneficial insects**

*Description:* Beneficial insects that are good for the garden because they eat harmful insects or promote crop growth through pollination. Such insects include ladybugs, praying mantis, honeybees, spiders, wasps, lacewings, butterflies, and dragonflies. Sites are friendly and attractive to beneficial insects when there is a diversity of plants and where pesticide use is limited.

### **Crop diversity**

*Description:* refers to the variety of plants grown on a site. Mixed vegetable farms can have positive impacts on soil health and limit pest problems. Farms that only grow one crop (**monocropping**) are often easier to manage and and those that grow commodity crops such as soybeans, corn and wheat, may be subsidized by the federal government. Monocropping can leave a farm vulnerable to disease and pest infestation, weather conditions, and a fickle market.

