



THE DOLLARS AND “SENSE” OF COVER CROPS

GRADES 9-12

DEFINITIONS

Benefit – monetary or non-monetary gain received because of an action taken or a decision made

Cost – an amount that must be paid or spent to buy or obtain something

Cost-benefit analysis – a comparison of the costs and benefits of an action in order to make a decision

Opportunity cost – the benefit that a person could have received, but was given up, to take another course of action



[WATCH SLOW JAM - COVER CROPS](#)

BACKGROUND INFORMATION

We make lots of different decisions every day by weighing the costs and benefits of our decisions. A cost-benefit analysis involves considering different alternatives to see whether the benefits of a decision outweigh the costs. If the benefits outweigh the costs, we might choose to buy a product or make a decision.

Farmers make lots of decisions associated with their farm operation. The costs and benefits of an action are often heavily weighed before making a change to farm management. In this exercise, students will determine the costs, benefits and value associated with using cover crops. Although the exercise seems simple, students will learn that analyzing costs of benefits can be quite difficult, and sometimes subjective, when monetary values of a cost or a benefit are hard to determine.

PROCEDURE

1. Using the worksheet on the following pages, break students into small groups and have each group list five potential costs associated with using cover crops. Make sure students brainstorm the steps and actions a farmer might go through to use cover crops, but don't worry about putting a monetary value on the cost just yet.
2. Have students list five potential benefits of cover crops they remember hearing about from the video “Slow Jam Cover Crops.”
3. Have students compute the monetary value of the cost of cover crops using the scenario given on the worksheet.
4. Have students brainstorm how they might be able to put a monetary value on the benefits of cover crops.

Tip: Consider the [Economics of Cover Crops publication](#) produced by Iowa Learning Farms to estimate the value of benefits that cover crops provide.

Questions to Consider During Activity:

- How were you able to come up with a total monetary cost and total monetary benefit of cover crops? How did the costs vs. benefits compare?
- What were some of the things for which it was difficult to add a monetary value? Why?
- How would you give shared resources like unclean water a monetary cost? Who is impacted by unclean water?
- Based on your analysis, are cover crops worth it for this farmer to try?
- What are some of the factors that influence farmers' decisions of whether or not to use cover crops?

Relating to Students:

- Can you think of a decision you recently made in your life that was easy? What made it easy? What did you decide?
- Can you think of a decision you recently made that was hard? What made it hard? What were the most important factors that influenced your decision-making?

THE DOLLARS AND "SENSE" OF COVER CROPS

A farmer wants to try cereal rye as a cover crop for the first time on 40 acres of his/her cropland. Cereal rye is a type of grass. The farmer will seed the rye in late August by dropping the seed from an airplane onto the field of standing corn. The seed makes its way down through the corn, landing on the soil and then germinating in about 10 days. Once the corn is harvested and more sunlight is available to the rye, this type of cover crop grows quickly, producing biomass and covering the soil to protect it from erosion. The rye will also keep nutrients in place by using available nitrate to grow; the nitrate will be released as it breaks down in the following crop growing seasons. Cereal rye will go dormant during the winter due to cold temperatures.

The following spring, the rye will green up and grow again. The farmer will spray an herbicide to kill the cover crop before planting soybeans. Then the farmer will plant his/her beans straight into the left-over residue from the cover crop.

The cost of cereal rye seed is 24 cents per pound. The farmer will seed at a rate of 60 pounds per acre. Because the cover crop is being seeded by airplane, the farmer will pay a pilot \$19 per acre for the pilot's services. In the spring, the farmer will have extra labor and resources to kill the cover crop - \$5.70 per acre for the herbicide used to kill the cover crop and \$4.20 per acre for the fuel and machinery cost, and \$1.30 per acre in labor to spray the herbicide to kill the cover crop.

What are the costs of cover crops in this scenario? Keep in mind that costs can be related to money, time or trouble. Cost can also be an "opportunity cost" – the farmer might have missed another opportunity to spend money or time on something else.

1. _____
2. _____
3. _____
4. _____
5. _____

What is the monetary value of each cost?

1. _____
2. _____
3. _____
4. _____
5. _____

Total monetary value of costs: \$ _____

Cost per acre: \$ _____

What are the benefits of cover crops? Benefits can result in a gain by the farmer personally or a benefit to a shared resource such as water.

1. _____
2. _____
3. _____
4. _____
5. _____

What is the monetary value of each benefit? In addition to the direct benefits to the farmer, what are some benefits to shared resources such as water?

1. _____
2. _____
3. _____
4. _____
5. _____

Total monetary value of benefits: \$ _____

COVER CROP CHALLENGE SCENARIO!

The farmer in the previous scenario has decided to try cereal rye cover crops again for the following year on the same 40 acres of cropland using the same process. This year, the farmer will also harvest the cereal rye in the spring and feed it to his/her 40 cattle in the place of hay. Each animal weighs an average of 650 pounds and eats about \$10 in hay per month. The farmer will be able to harvest enough of the cover crop forage from his/her 40 acres to feed the cattle for the equivalent of one month. The farmer will have the 40 cattle for a total of five months (Cost source: Ag Decision Maker, [Livestock Enterprise Budgets for Iowa](#)).

Re-run the cost-benefit analysis. How much will the farmer save in feed costs by utilizing cover crops as forage in spring? With these savings, what is the new cost of cover crops? Compare and contrast the economics of the different scenarios.

ANSWER KEY

Cover crop costs: cost of seed, cost of pilot, cost to run the machinery, cost of labor, cost of management (herbicide) to kill cover crop

Monetary costs:

	Total Cost	Cost per Acre
Cost of Seed: (60 pounds per acre x 40 acres) x 24 cents per pound =	\$576	\$14.40
Cost of Pilot: \$19 per acre x 40 acres =	\$760	\$19.00
Herbicide used to kill cover crops: \$5.70 per acre x 40 acres =	\$228	\$5.70
Labor (spraying chemical): \$1.30 x 40 acres =	\$52	\$1.30
Fuel and machinery costs for spraying: \$4.20 x 40 acres =	\$168	\$4.20
	<hr/>	
Total monetary costs:	\$1,784	\$44.60

Monetary costs – cover crop challenge: Savings in feed cost with spring cover crop forage: \$400, or \$10.00 per acre

Cover crop benefits: increase infiltration of excess surface water, add organic matter to soil, increase soil aggregate stability, reduce weeds/decrease herbicide use, reduce compaction, erosion control, increase yield, increase soil fertility, grazing/forage/food source for cattle

Community benefits from cover crops: reduce nonpoint source pollution caused by sediment, nitrogen and phosphorus