

Cover Crops in the Rotation

Introduction (~5 minutes)

When you hear the term, “cover crops,” what do you think of? What have you heard others say about cover crops in the past?

While this entire project book addresses these questions, we will begin to explore some of them in this chapter. Before you get started, jot down your thoughts in response to these questions.

What do you think of when you hear "cover crops"?

How do cover crops fit between cash crops?



What are some of the benefits of growing cover crops?

What are some of the drawbacks to growing cover crops?

Explore (~15 minutes)

Look at the page at the back of this module. At the top is a two-year calendar. The center of the page is a key, showing you when each of the crops can be grown in the Midwest.

Cut along the dotted lines so you will be able to place the crops on the calendar. You'll notice the cash crops do not have cut lines. You never want to shorten the season of your money-making

crop! The cover crops can have shortened seasons, though there are consequences for *any* shortened season.

Place the corn and soybeans (only) where they fit on the calendar. How much brown/black soil do you see left on the calendar? The brown/black represents how much of the year the soil is left fallow (not growing anything).



Now try introducing a cover crop or two. Crops can continue from the end of Year 1 into the beginning of Year 2. They can also continue from the end of Year 2 into the beginning of Year 1. Most farmers alternate planting corn and soybeans because the two plants use different nutrients. (A crop rotation like this is a great way to save money on fertilizer!)

Try fitting each of the cover crops into the calendar until you find the best combination of cash and cover crops. Note that crops can

sometimes overlap if they are interseeded, or one is planted before the other is harvested.

When two crops are harvested in one year, it is called double-cropping.

Which combination of crops do the best job of covering the soil across the whole year?

Explain (~10 minutes)

Pennycress is an emerging cover crop. It can be grown as a winter cover crop. It fits into a normal crop rotation, and it keeps the ground covered most of the year.

Most seeds store their energy in starches. Pennycress seeds store energy as an oil (an energy-dense liquid fat). Pennycress can be a cash crop, or a crop that can be sold. Its oil can be made into biofuel, cooking oil, and more. After its seeds are crushed to extract oil, leftover materials can feed cows or other livestock.

Domesticated pennycress could give farmers \$50–\$250 of revenue per acre every winter, so it provides more income than fallow fields.

Take a look at the jumbled photos. Put them in order from seed to harvest by numbering them. Then, label each photo with the activity you see.

Word/Phrase Bank

Harvest	Flowering	Drying
Developing seed pods	Seed	Rosette



Image ___ of 6

Label:



Image ___ of 6

Label:

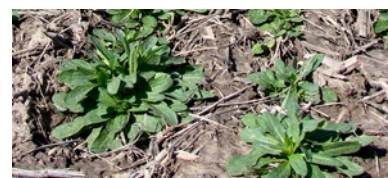


Image ___ of 6

Label:



Image ___ of 6

Label:



Image ___ of 6

Label:



Image ___ of 6

Label:



Explain to a friend or family member how domesticated pennycress could fit into a normal

corn–soybean crop rotation. Use the photos and your two-year calendar to explain the process.

Extend (~10–30 minutes)

The Corn Belt is the region in the Midwest where soil and climate are ideal for corn and soybeans. This region includes Indiana, Illinois, Iowa, Minnesota, Nebraska, and Kansas. The Corn Belt is vital to our food supply. Corn and soy also earn farmers most of their income.

What are some questions to answer before using pennycress as a cover crop? One question is given, but you should come up with at least three more. If you know any farmers, you can ask them to help brainstorm questions.

Because these crops are so important, cover crops generally avoid breaking these cycles.

1. Domesticated pennycress is planted in the fall after the corn/soy harvest. By what date does pennycress need to be planted to start growing before winter?

2. _____

3. _____

4. _____

5. _____

After you have devised your list of questions to consider, do a web search to find answers to your questions.

Here are some websites to get you started.

- <https://www.iprefercap.org/>
- <https://artsandsciences.osu.edu/news/pennycress>
- <https://www.forevergreen.umn.edu/crops-systems/winter-annual-grains-oilseeds/pennycress>



Notes

Reflect (~5 minutes)

Return to the questions you pondered at the beginning of this chapter. How have your ideas changed?

What do you think of when you hear "cover crops"?

There are benefits from growing cover crops. What benefits can you think of?

There are drawbacks to growing cover crops. What drawbacks can you think of?



Career Connection: Agronomist

Agronomists work to apply knowledge of soil and plants to agriculture. They decide how to best manage crops. This requires a grasp of crop science, soil science, hydrology (the study of water), and other related fields.

Agronomists work in labs, offices, and in the field. They usually have a four-year degree in agriculture or a related field. Many go on to earn advanced degrees.

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Year 1 January		Year 1 February		Year 1 March		Year 1 April		Year 1 May		Year 1 June		Year 1 July		Year 1 August		Year 1 September		Year 1 October		Year 1 November		Year 1 December	
Year 2 January		Year 2 February		Year 2 March		Year 2 April		Year 2 May		Year 2 June		Year 2 July		Year 2 August		Year 2 September		Year 2 October		Year 2 November		Year 2 December	

▼ Cash Crops



Corn is planted in **Mid-April**.
It is harvested in **Mid-October**.



Soybeans are planted in **Mid-April**.
They are harvested in **Mid-September**.

Cover Crops >



Pennycress is planted in **Mid-September**.
It is harvested in **Early June**.



Cereal Rye is planted in **Mid-October**.
It must be terminated in **Early April**.



Oats are planted in **Mid-September**.
It is winter terminated in **Mid-November**.



Radishes are planted in **Mid-September**.
They are winter terminated in **Mid-November**.

