



COVER CROPS 1: WHICH COVER CROPS WILL YOU USE?

THE NASHVILLE FOOD PROJECT

What is this user's guide?

This guide can be used by trainers who want to assist pre-literate and/or English- as a second language-speaking farmers with including cover crops in vegetable production and other crop rotation schedules. It covers three major types of cover crops (mustards, legumes, and 'other'), and the potential benefits and costs of cover crops. It leads farmers through the process of identifying what they want to accomplish via cover cropping, assists them with identifying opportunities within their production schedule for insertion of cover crops, and assists farmers with selecting the cover crop or mixture of cover crops which best match their needs and goals. Some data is specific to the Southeast region of the United States, but links to resources where data appropriate to other regions can be accessed are provided.

ISED SOLUTIONS
INSTITUTE FOR SOCIAL AND ECONOMIC DEVELOPMENT



This material is funded in partnership by USDA, Risk Management Agency,
under award number RM17RMEPP522C029.

Who made this guide?



ACKNOWLEDGMENTS: This teaching resource was developed by Lauren Bailey of The Nashville Food Project in Nashville, TN in partnership with the Institute for Social and Economic Development (ISED Solutions). This material is funded in partnership by USDA, Risk Management Agency, under award number RM17RMEPP522C029.

WHY IS THIS TRAINING NEEDED?

While there are many resources available on cover crops, the breadth of information is often too comprehensive to teach in one session for farmers with limited-English and/or literacy. In our observations, farmers may have basic, experiential knowledge of cover crops and how they are good for the soil. This session builds on that experiential knowledge, filling in information which may be new to some farmers about the benefits of cover crops and the variety of cover crop species which are available. This module assumes that farmers have the ability to take some beds out of production for either Summer or Winter cover cropping.

HELPFUL RESOURCES FOR STAFF/TRAINERS:

Managing Cover Crops for Profitability by SARE. You can download this resource for free at:

<https://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>

TEACHING TIP:

Throughout this guide, boxes (like this one) contain teaching tips to help you better facilitate farmer learning. Most come from other programs who have tested and reflected on using this lesson.

Objectives and Skills

NEW VOCABULARY:

- Cover Crop
- Grass
- Bean or Legume
- Mustard or Brassica
- Soil erosion
- Beneficial insect
- Pest pressure
- Cash crop
- Nitrogen

OBJECTIVES: By the end of this session, farmers will be able to:

- State whether a particular cover crop is a legume/bean, a mustard/brassica or a cover crop that falls into the “other” category.
- Understand the difference between cover crops and cash crops.
- Name at least three benefits of planting cover crops
- Match specific benefits with appropriate group(s) of cover crops.
- Name three costs associated with planting cover crops
- Understand the planning steps required for cover cropping
- Use materials provided to describe the steps involved in selecting the right cover crop in examples and real-life situations.
- Use information and materials provided in this module to select a cover crop which provides the benefits they want and fits into their crop rotation.
- Identify opportunities in their crop rotation where cover crops can be inserted.
- Use good practices in managing their cover crops for optimal crop production: timely seeding, mowing, killing, etc.

PROOF OF LEARNING: I will know that farmers have achieved learning objectives because they are able to:

- Use information and materials provided in this module to select a cover crop or a mix of cover crops which provides the benefits they want and fits into their crop rotation.
- Identify opportunities in their crop rotation where cover crops can be inserted.
- Use good practices in managing their cover crops for optimal crop production: timely seeding, mowing, killing, etc.

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- Audience
- Resources needed

7 MATCHING COVER CROPS / ACTIVITY 1 / 15 MINUTES

Activity and discussion

- This activity introduces and reviews main cover crop categories (brassicas, legumes, others) and cover crop definitions. Participants share knowledge with one another about their own observations of these cover crops and their soil.

9 BENEFITS OF COVER CROPS / ACTIVITY 2 / 25 MINUTES

Lesson, discussion, and activity

- This activity reviews the benefits of cover crops and engages farmers in a discussion of how they want to use cover crops.

13 COSTS COMPARED TO BENEFITS / ACTIVITY 3 / 10 MINUTES

Discussion and activity

- Compare with farmers the potential costs of using cover crops compared to benefits

14 PLANNING FOR YOUR COVER CROP / ACTIVITY 4 / 30 MINUTES

Activity

- This activity reviews planning steps for deciding which cover crop to plant.

TEACHING TIP:

"When I teach about cover crops, the lesson starts with a discussion of soil fertility and what kinds of "food" plants need to get from the soil. Many growers we've worked with don't have experience using fertilizers or understand how they work. So, I think that knowledge is assumed in this User Guide."

- Katie

Audience



PREREQUISITE KNOWLEDGE REQUIRED/USEFUL:

Though not necessary, it may be beneficial if farmers have previously learned the definitions for cover crop, soil erosion, pest pressure, and beneficial insects. Farmers need to recognize that nitrogen is a component of fertilizer.

EXPLICIT SKILLS which may need to be pre-taught, or integrated into the lesson:

Reading a grid

LITERACY LEVELS: Appropriate for all levels of literacy. Graphics allow non-literate students to participate.

LANGUAGE LEVELS: If using an interpreter, should be appropriate for most English-speaking levels.

FARMING EXPERIENCE: This module is probably most appropriate for farmers who have had one season of experience, but the topic could be introduced to first year farmers.

REGION / CLIMATE: This module is adaptable to all regions and climates. Data which is specific to the Southeastern US is clearly labeled and links to resources for accessing equivalent data for other regions are provided.

PROGRAM STRUCTURE: Any: CSA structure or wholesale aggregation or no aggregation.

SEASON: Ideally, this is taught during the off-season if trying to encourage farmers to plant cover crops throughout the season; Fall, if encouraging farmers to plant winter cover crops.

TEACHING TIP:

"We work with farmers who grow on many scales, from micro urban farms to small and medium sized urban farms. For the latter, we like to recommend cover cropping as the best practice for soil stewardship and this module would be useful in educating farmers why cover cropping is best practice. But it might be effective to deliver this lesson to individual farmers and provide one-on-one training based on the very good information contained in this User Guide."

- Craig

Resources needed



TIME: One 2-hour session, if all activities are employed

STAFF: An instructor plus language interpreter(s).

INTERPRETER: Yes, if participants are not proficient in English.

LOCATION: Written for classroom, but can be adapted for presentation in the field.

RESOURCES AND MATERIALS NEEDED TO CONDUCT THE SESSIONS:

Each farmer should receive:

- Cover Crop Planning Steps Handout
- Summer Cover Crop Benefits Handout

Additional materials and resources include:

- Enough pictures of cover crops for each farmer to have one
- Flip chart & Markers
- Pictures of Cover Crop Benefits
- Pictures of Costs of Cover Crops
- Pictures of Cover Crop Planning Steps
- ‘Cover Crops Planning Steps’ handout
- Slide Show: ‘Which Cover Crops Will You Use?’
- Painter’s Tape (to tape materials to wall, if needed)

Matching Cover Crops

TIME: 15 Minutes

OVERVIEW:

This activity introduces and reviews main cover crop categories (brassicas, legumes, others) and reviews cover crop definitions. Participants share knowledge with one another about their own observations of these cover crops and their soil.

MATERIALS NEEDED:

- Slide Show: ‘Which Cover Crops Will You Use?’
- Photos of cover crops.

OBJECTIVES / LEARNING:

By the end of this activity participants will be able to:

- State whether a particular cover crop is a legume/bean, a mustard/brassica, or ‘other’.
- Understand the difference between cover crops and cash crops.

VOCABULARY

Cover Crop	Bean/Legume
Cash Crop	Plant Food/Fertilizer
Mustard/Brassica	

LESSON STEPS:

- Matching Activity: Begin the lesson by giving each farmer-participant a picture of a cover crop.
- Depending on the literacy level of your farmers, you may choose to include the name of that cover crop on the picture.
- Ask farmers to search and form a group with others who have pictures of cover crops that look like their crop or that look like they might be in the same family as their crop.
- Once everyone has grouped, you can use the slides to show the groups of cover crops that belong together. Check to see if the farmers had grouped themselves together matching the groups as seen on the slide show: beans, legumes, or ‘other’.

LESSON STEPS, CONT.:

- Group Discussion: Starting with one group, ask farmers if they recognize any of the crops in their group. If someone does recognize a crop, ask them if they know the name of the crop, and what do they know about this crop, as it relates to the soil. Write down any benefits that farmers associate with cover crops and the improvement of soil.
- If no one initially offers information, give an example: “I recognize the radish, and I have seen that where I plant long daikon radishes, the ground is easier to work because the roots help break up the soil.”
- Tell farmers that all of the crops that we just looked at can be categorized as cover crops, depending on how they are planted and harvested.
- Ask farmers if anyone can define cover crop.
- Cover Crop Definition from the SARE brief, Cover Crops for Sustainable Crop Rotations, “A cover crop is a plant that is used primarily to slow erosion, improve soil health, enhance water availability, smother weeds, help control pests and diseases, increase biodiversity and bring a host of other benefits to your farm.”
- Some farmers may be familiar with the term cash crop. You can share with farmers that unlike cash crops, or crops that you grow for a profit, cover crops are crops you grow for the long-term benefits for the soil.
- Review all the names of all the crops in the slide show with the students.
 - Mustards (Brassicicas), Examples: mustard greens, daikon radish
 - Beans (Legumes), Examples: clovers, vetch, cow peas, snap peas
 - Others, Examples: winter rye, barley, oats, wheat, sorghum Sudan, buckwheat

Benefits of Cover Cropping

2

TIME: 25 Minutes

OVERVIEW:

This activity reviews the benefits of cover crops and engages farmers in a discussion of how they want to use cover crops.

MATERIALS NEEDED: CONT:

- Flip Chart
- List of Benefits of Cover Crops
- Pictures representing each of the three groups of cover crops in this module:
Mustards, Beans/Legumes, and Others
- Pictures representing each of the benefits of cover crops mentioned in this guide (You can print from the slides- extra pictures of each benefit may be needed to create a visual)
 1. Erosion Fighter
 2. Weed Fighter
 3. Pest Fighter
 4. Beneficial Insect Attractor
 5. Soil Builder
 6. Nitrogen Source
 7. Nitrogen Scavenger
 8. Moisture Conservation

MATERIALS NEEDED, CONT.:

- Flip chart paper or poster board
- Blue painter's tape
- Markers
- Set of flashcards / photos

OBJECTIVES / LEARNING:

By the end of this activity participants will be able to:

- Name at least three benefits of planting cover crops
- Match specific benefits with appropriate cover crop or group(s) of cover crops.

VOCABULARY

Soil Erosion Beneficial Insect
Pest Pressure Nitrogen

TEACHING TIP:

"It might be useful to have samples of soil to demonstrate the look and feel of different soil types before and after cover crops to help farmers identify if their soil is more like one or the other and how it can be improved."

-Craig

LESSON STEPS:

- Review the three main groups of cover crops and the typical benefits associated with that crop group using the slide show.
- You may want to create a visual in the room for farmers to see the benefits associated with each cover crop group. If you want to do this, you will need flip chart paper or poster board, extra copies of the pictures representing the benefits and painter's tape (see next page for chart).
- Slide 18: Discuss with farmers what is needed to achieve the desired benefit. What do you need to do in order to get the benefit?
 - In order to get the optimal benefit from your cover crop, you generally want to wait until the crop has flowered (see slide show pictures)
 - If you think about the life cycle of a plant, once the plant has set flowers it is moving towards the end of its life. So, if you wait until after the plant is flowering and chop it down before the seeds disperse, you will get the optimal benefit from the cover crop.
- After reviewing, engage farmers in another activity to match benefits with each cover crop group.
- Make sure that farmers know that benefits may be associated with multiple cover crops groups.
- If you previously constructed a visual, remove the benefits from the visual and hand those out among farmers. If not, hand out pictures of benefits and create a framework for the visual with flipchart paper and markers. You'll want to produce something along the lines of the chart on page 12.
- Give farmers a picture of a benefit and ask them to place this picture in whichever group they think it belongs.
- Once everyone has placed their benefit in a group, discuss the results. Review the benefits of each group and adjust if need be.

COVER CROP GROUP

GENERAL BENEFITS

Mustards (Brassicaceae)

Examples:

mustard greens, daikon radish

- Erosion Fighter: Reduce and prevent soil erosion
- Weed Fighter
- Pest Fighter
- Soil Builder: Reduce soil compaction
- Keep moisture in the soil

Beans (Legumes)

Examples:

clovers, vetch, cow peas, snap peas

- Nitrogen source: Fix atmospheric nitrogen for use in subsequent crops
- Soil Builder: Increase organic matter
- Erosion Fighter: Reduce and prevent soil erosion
- Attract beneficial insects
- Keep moisture in the soil

Others (Non-Legumes)

Examples:

winter rye, barley, oats, wheat,
sorghum Sudan, buckwheat

- Nitrogen Scavenger, left over from a previous crop
- Erosion Fighter: Reduce and prevent soil erosion
- Soil Builder: Increase organic matter
- Weed Fighter
- Keep moisture in the soil

COVER CROP GROUP

BENEFITS

Mustards (Brassicas)

Examples:

mustard greens, daikon radish

Beans (Legumes)

Examples:

clovers, vetch, cow peas, snap peas

Others (Non-Legumes)

Examples:

winter rye, barley, oats, wheat,
sorghum Sudan, buckwheat

Costs Compared to Benefits

3

TIME: 10 Minutes

OVERVIEW:

Compare with farmers the potential costs of using cover crops compared to benefits

MATERIALS NEEDED:

- Flip Chart
- List of Benefits of Cover Crops
- Pictures of Benefits of Cover Crops
- Pictures representing each of the costs of cover cropping mentioned in this module (which can be printed from the slide show):

MATERIALS NEEDED, CONT.:

1. Seeds and other inputs (fertilizer, compost, water)
2. Loss of income from vegetables displaced by cover crop
3. Labor for seeding and killing the cover crop

OBJECTIVES / LEARNING:

By the end of this activity, participants can:

- Name three costs associated with planting cover crops

LESSON STEPS:

- Brainstorm with farmers to name the potential costs of cover cropping. Ask farmers to answer, “What are the potential costs of cover cropping? ”

Examples:

- Seed and other inputs (fertilizer, compost, water)
- Not having vegetables to sell from this plot
- Labor for planning, seeding, and killing the cover crop
- Write all potential costs on flip chart or put up pictures. Ask farmers how these might compare to the benefits. Write or put up pictures of the benefits of cover crops.

Planning for your Cover Crop

4

TIME: 30 Minutes

OVERVIEW:

This activity reviews planning steps for deciding which cover crop to plant.

MATERIALS NEEDED:

- Slide show: ‘Which Cover Crops Will You Use?’
- Poster of ‘Plant for Summer Cover Benefits’
- ‘Cover Crop Planning Steps Handout’
- Printed slides of Cover Crop Planning Steps

OBJECTIVES:

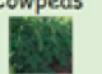
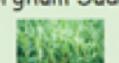
By the end of this activity participants will be able to:

- Understand the planning steps required for cover cropping
- Use the ‘Cover Crops Planning Steps’ handout to describe the steps involved in selecting the right cover crop in examples and real-life situations.

To make Poster of ‘Plant for Summer Cover Benefits’

- Note: If you are in a different region, use “Managing Cover Crops for Profitability” by SARE to generate information on summer cover crops for your region.
- Before the lesson, create a large visual grid that farmers can use to demonstrate which summer cover crops fall into which benefit category. You can use flipchart paper, poster board or a whiteboard. Print the pictures from the slides for benefits and cover crops as manipulatives for this large visual. If the cover crops for your region are different, this website is a helpful resource: <http://covercropimages.sare.org/>. Your visual should look something like the chart on the next page. You can add pictures with tape or Velcro, so that the participants build the visual together. You will need more than one picture of each specific cover crop. For example, in the chart below, you will need 4 Sorghum Sudan pictures, 3 Cowpea pictures and 2 Buckwheat pictures. Bolded names are excellent at getting the benefit desired, while un-bolded names are very good at getting the benefit.

Plant for Summer Cover- Southeast Region

Soil Builder 	Buckwheat 	Sorghum Sudan 	Cowpeas 
Erosion Fighter 		Sorghum Sudan 	Cowpeas 
Weed Fighter 	Buckwheat 	Sorghum Sudan 	Cowpeas 
Nitrogen Scavenger 		Sorghum Sudan 	

LESSON STEPS:

- Introduce the purpose. There's a lot of information to cover crops, so what we're about to walk through is how to go about planning for cover crops. We'll start by walking through six main questions that you should ask yourself if you are planning to plant a cover crop.
- With the farmers, review the planning questions on each slide.
 1. What benefit do you want from planting a cover crop? Or, what problem do you want to solve?
 2. Where will you plant it?
 3. How will you seed it? Do you have the needed equipment and labor?
 4. What will the weather be like when you plant? What will the soil temperature and soil moisture be like? Will you have time to make this work?
 5. Will the crop die over winter? Or if not, how do you plan to kill it so that you can get the benefit you want?
 6. Do you want to plant for Winter cover or Summer cover?
- Go through a couple of examples with the farmers. You may want to think about your region and individual farmers to provide an example that is best for your context. If there is a farmer who has had a specific situation in the past, it might be a good idea to see if they are okay with you using their situation as an example.

Example 1:

1. Last year, I had to rush to get my plot ready before planting summer cover crops. I'd like to solve this problem by planting a cover crop that can smother weeds and conserve soil moisture so that I can just plant into the decaying plant material when I am ready to transplant.
2. I will plant this cover crop where I want to plant my tomatoes, peppers, and eggplant next summer.
3. I will need to till the ground first using a tractor. Then, I will broadcast the seed using a hand-held seeder.
4. Since I want to have the plant established by early Spring, I will plant in the late fall, maybe in October. The weather in October is sometimes dry, with little rainfall. So, I know that I will need to have a plan to irrigate so the cover crop seeds can germinate. I think if I plan appropriately, I will have enough time to make this work.
5. The crop will stay alive through the Winter and will start growing in the Spring. I will mow or scythe the cover crop down in late April so I can plant my crop in May.
6. I want to plant in the fall for winter cover.
7. I want a cover crop that is a weed fighter and one that can help me keep moisture in the soil.
8. Looks like my best options could be Oats, Rye or Daikon Radish.

Example 2:

1. I really want to improve my crop rotation, and make sure that I improve the soil between my Spring and Fall crops. So, I'd like to build my soil.
2. I will plan to plant this cover crop where I have planted my Spring mustards and where I will plant my Fall carrots.
3. Once I pull all my mustards out, I will broadcast the seed using a hand-held seeder.
4. Since I'll plant after my Spring crop, the weather will probably be hot when I plant. I think if I choose the right cover crop I can make this work.
5. I will plan to mow my cover crop.
6. I want to plant for summer cover.
7. It looks like my best options could be Buckwheat, Sorghum Sudan or Cowpeas, depending on how long each of those will take to grow.

Example 2, cont.:

- Additional activity: Give each farmer a picture representing a step from the ‘Cover Crop Planning Steps’ handout. Review what each picture means- you can do this by asking the farmers to describe what they see happening in their picture. If they don’t know, ask if anyone else knows. Then ask the farmers to put their steps in the correct sequence.