



# COVER CROPS 2: HOW TO SELECT COVER CROPS & HOW TO TRACK THE BENEFITS OF COVER CROPPING

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 leads farmers through the process of sorting through the characteristics of specific cover crops to select the best one or mix of cover crops to meet their goals. It introduces farmers to a series of questions that they can answer throughout the growing season to evaluate the performance of the cover crops they have planted. Worksheets are provided so that trainers can assist farmers with this evaluation and with recording the results.

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



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# Who made this guide?



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## 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 Summer 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

## REVIEW 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:

- Incorporate cover cropping into Summer crop plans.
- Assess field performance and benefits achieved by planting cover crops.

## PROOF OF LEARNING: I will know that farmers have achieved learning objectives because:

- They incorporate cover cropping into their Summer crop plans.
- They evaluate the performance of the cover crops they plant.

Note: Module 2 can follow Module 1 or be adapted to stand alone.

# Table of Contents

## **5 IS THIS GUIDE RIGHT FOR YOU**

- Audience
- Resources needed

## **7 ACTIVITY 1 / 50 MINUTES**

- This activity is a review of topics covered in the previous Users Guide: 'Which Cover Crop Will You Use?': Summer cover crops, their benefits, and what you have to do to get each benefit.

## **12 ACTIVITY 2 / 50 MINUTES**

- Participants practice choosing summer cover crops.

## **15 ACTIVITY 3 / 20 MINUTES**

- This activity introduces farmers to the list of questions that they will be asked at different checkpoints during the season.

## **17 ACTIVITY 4 / 20 MINUTES**

- Track cover crop benefits with farmers through the Summer growing season.

# Audience

## **PREREQUISITE KNOWLEDGE REQUIRED/USEFUL:**

Useful if farmers have previously been introduced to the definition of cover crop.

## **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 for the Summer season.

# Resources needed

**TIME:** One 2-hour session. Some activities could be left out, if you need to cut down on time.

**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: 'Summer Cover Crops & Tracking Benefits'
- Painters Tape (to tape materials to wall, if needed)
- Managing Cover Crops for Profitability:

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

- SARE Cover Crop Image Library: <http://covercropimages.sare.org/>

# Activity 1

# 1

**TIME:** 50 Minutes

**OVERVIEW:**

This activity is a review of topics covered in the previous Users Guide: ‘Which Cover Crop Will You Use?’: Summer cover crops, their benefits, and what you have to do to get each benefit.

**MATERIALS NEEDED:**

- Slide show: ‘Summer Cover Crops & Tracking Benefits’
- Summer Cover Crop Benefits poster material (with photos of your regional cover crop options)
- Flipchart, poster board, or white board
- Pens and markers
- Painters’ tape
- Your regional summer cover crop chart-for facilitator
- Cover Crop photos from Module 1
- Managing Cover Crops for Profitability: <https://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>
- SARE Cover Crop Image Library: <http://covercropimages.sare.org/>

**OBJECTIVES / LEARNING:**

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

- Understand the benefits of cover crops
- Understand the actions needed to get each benefit
- Name crops that can be grown for Summer cover cropping in their region



## LESSON STEPS:

- **Review:** If Module 1 has already been taught, take time to review the benefits of cover crops with farmers. Ask farmers if they can remember what benefits can be gained from planting cover crops. As facilitator, review the benefits that were not mentioned by farmers.

### General Benefits

- Soil Builder: Reduce soil compaction, increase organic matter
  - Erosion Fighter: Reduce and prevent soil erosion
  - Weed Fighter: Suppresses weeds
  - Pest Fighter: some cover crops release toxins which can prevent or reduce some pests
  - Nitrogen Scavenger: scavenge nitrogen left over from a previous crop
  - Nitrogen source: Fix atmospheric nitrogen for use in subsequent crops
  - Attract beneficial insects
  - Keep moisture in the soil
- Ask Farmers what is needed to achieve the desired benefit. What do you need to do in order to get the benefit?
    - o 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).
    - o 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.

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

## LESSON STEPS, CONT.:

- **Discuss summer cover crop options**

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

- o 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 of benefits and cover crops as manipulatives for this large visual. If the cover crops for your region are different, the SARE Cover Crop Image Library website <http://covercropimages.sare.org/> is a helpful resource. Your visual should look something like the chart below. You can add pictures with tape or Velcro, so that you can build the visual together with the participants. You will need more than one picture of each cover crop. For the example below, you 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.
- Fill-in the large visual grid as a group. You can do this by inviting individual farmers to tell you what they see in the Benefits pictures
- o For example, you ask Lal to identify the Erosion Fighter picture by giving him the photo and asking him to describe what he sees in the picture. He may say something like, “I see one part of the land where it looks like water has created a path and I see another part of land that doesn’t have that.” You can then validate what he sees and ask him to think back to what benefit of cover crops he thinks this picture represents. Help him to place the picture with the words that match.
- o If you are working with a group of farmers who share cultural or linguistic understanding, it can benefit you as a facilitator to use shared language. Even if we’ve identified this benefit as Erosion Fighter, farmers might find a better way to phrase this for their own understanding. It might be that as a group you decide this benefit might be better named Soil Keeper or No Flood. If this is something that works for your group, just work to make sure that you use this shared term consistently throughout the lesson.

## LESSON STEPS, CONT.:

- To introduce each specific cover crop, ask for a volunteer to identify which cover crop group they think this crop belongs to (i.e., this is part of the “beans” group).
- o It may help to have another visual with the cover crop groups and pictures of cover crops in that group somewhere in the room to give farmers another visual cue. You can use pictures that you printed from Module 1 and post them in groups in the room.

**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



## LESSON STEPS, CONT.:

- After having a volunteer identify what group the crop belongs to, introduce the name of the crop to everyone.
- o This crop is in the “Bean Group” and in English, we call this a Cowpea.
- o After introducing, continue to build out your large visual by placing this picture under the appropriate benefit. You might add a star to your visual if the cover crop is excellent at getting the benefit desired.
- Once you have built out your visual together, discuss the specifics of each cover crop as outlined below.
- o While going through these specifics, give the farmers time to teach back information. Once you review all cover crops, you might ask farmers:
  - Which cover crop will take the longest time to grow? Which one will take the shortest time?
  - Which cover crop should you mow down when it is 3-4ft tall?
  - Which cover crop is good for regions that are hot and dry?

### SOUTHEAST REGION

<b>Buckwheat</b>	<p>Length of time: ~40 days; kill 7-10 days after flowering</p> <p>Special notes: plant matter breaks down easily; attracts beneficial insects</p>
<b>Sorghum Sudan Grass</b>	<p>Length of time: ~ 70 days</p> <p>Special notes: creates lots potential for organic matter; can plant about 2 weeks after prime corn planting (soil needs to be warm and moist); mow when grass is 3-4 feet tall- keep at least six inches; incorporate it into the soil if planning to plant in fall</p>
<b>Cowpeas</b>	<p>Length of time: ~60 days</p> <p>Special notes: can grow in regions that are hot and dry; attracts beneficial insects; incorporate into soil before pods set to avoid stink bug invasion</p>

# Activity 2

# 2

**TIME:** 50 Minutes

**OVERVIEW:**

Participants practice choosing summer cover crops.

**MATERIALS NEEDED:**

- Slide show: 'Summer Cover Crops & Tracking Benefits'
- Summer Cover Crop Benefits poster materials
- flipchart, pens, blue painters' tape or white board, markers
- your regional summer cover crop chart (for facilitator)

**OBJECTIVES / LEARNING:**

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

- Identify factors to consider in selecting a cover crop for Summer production
- Select the best cover crop for their Summer crop plan

## LESSON STEPS

- Review Planning for Cover Crop steps (Slides 19-23).
- Explain an example or two before having farmers try on their own.
- o Slide 24  
Prompt farmers to tell you what vegetables they see in the picture.
  - What veggies do you see in the picture?Then, walk through Example 1.

Example 1:

- Dim planted radishes, turnips and bok choy for her Spring Crop in her first two beds. She's wants to build her soil in these two beds and thinks that she could take both beds out of production for the summer.
- What else do we need to know in order to help Dim find out the best option?
- What cash crop will follow this cover crop?
- How much time is there between the preceding and following cash crops?
- What are Dim's best options for growing a summer cover crop that will build her soil?

## LESSON STEPS, CONT.:

- o Slide 25
  - Dim knows that she wants to plant green beans in Bed 1 and will need to do so by the first week in June, so she won't be able to leave this bed out of production for very long. She wants to grow lettuce in Bed 2 and she plans to transplant it in late August, so she will have a little bit longer to leave the bed out of production.
- o Slides 26-28: Share with farmers your thinking process as you consider each cover crop option.
  - So, it looks like buckwheat will take only 40 days. If Dim were to pick buckwheat as her summer cover crop for both of her beds, her beds would be out of production for about 50 days, since she'll need to wait 7 to 10 days for the buckwheat to decompose before she plants into it. We know that buckwheat is a fast grower and soil builder, attracts beneficial insects, and is an excellent weed fighter.
  - Sorghum Sudan Grass takes 70 days, which is a little over two months. We know that we can't plant sorghum Sudan until about two weeks after it's warm enough to plant corn. So, in our region that means that we probably won't be able to plant until June. If we planted in June, and it takes 70 days to grow, we'd need to leave it in until mid-August. We also know that we'd need to cut it when it reaches 3 feet, so that we can benefit from more organic matter. We'd have to wait 7-10 days until we could plant into it and we'd need to use the mower to chop it down and the tiller to incorporate it. So, at best, we could plant into it in late August/ early September. We know that sorghum Sudan is an excellent soil builder because it produces a lot of organic matter. It is also an excellent nitrogen scavenger and erosion fighter. If we planted sorghum Sudan, the beds would be out of production for about 80 days and we wouldn't plant until June.
  - Cowpeas take 60 days, and we know that we need to make sure we till them into the soil before the pea pods set so that we avoid a stink bug pest problem. We also know that cowpeas are good at growing in hot and dry regions, so they may be a good choice depending on the type of summer we are having. It sounds like our beds would be out of production for about 70 days, or a little over two months, if we planted cowpeas. We know that they are an excellent weed fighter and erosion fighter, and that they are also very good at building the soil.

- Which crop would you choose? Would you choose the same crop for both beds 1 & 2?
  
- o Ask for volunteers to share their thoughts about which cover crops would work. Encourage participants to speak by explaining that there is no wrong answer, and it may depend on timing, environment and willingness to try a new crop.
  
- Give farmers 10-15 minutes to think about their plots and production plan. Place an example picture of each summer cover crop in different locations around the room (you can remove these from the poster that you built in the previous activity or print another copy). Ask farmers to walk to the cover crop that they'd like to try incorporating into their plot.
  - o Ask for one or two volunteers to share their plan.

Prompt them by asking:

- Will you plant any vegetables in the Spring before your summer cover crop? If so, what will you plant?
- Will you plant any vegetables in the Fall after your summer cover crop? If so, what will you plant?
- What cover crop did you choose? Why did you choose it?

# Activity 3

# 3

**TIME:** 20 Minutes

**OVERVIEW:**

This activity introduces farmers to the list of questions that they will be asked at different checkpoints during the season.

**MATERIALS NEEDED:**

- 'Slide show: Summer Cover Crops & Tracking Benefits,' Slides 31-39
- Checklist of questions

**LESSON STEPS:**

- Introduce the purpose of these questions.
- Now that you know how to choose a cover crop for the summer, I hope that many of you will try to grow one this summer. We want to help you in capturing your observations about how this cover crop is impacting your plot, so we've got a list of questions that we'll plan to ask you after you plant the crop, after you kill the crop and then a few questions that we'll ask at the end of the season.
- If you have two staff available to role play asking these questions, that could be one way to introduce the farmers to these questions. Otherwise, introduce farmers to the questions using the slide show and using answers from your example in Activity 2.

**TEACHING TIP:**

"For us there has been a lot of trial and error with cover crops. Even though farmers seem to understand a lot of these concepts, it hasn't translated into cover crops actually being successfully planted. Broadcast seeding has not worked well for us and some type of seeder should ideally be used."

-Katie

## **COVER CROP CHECKLIST QUESTIONS:**

### **Mid-season Questions: to be asked shortly after crop was planted**

- What cover crop did you choose?
- What month/ season did you plant it?
- Was there anything planted in the plot before you planted cover crops?
- What was the weather like when you planted?
- How did you seed your cover crop? Did you broadcast, use a seeder or till it in?

### **Mid-season Questions: to be asked shortly after cover crop was killed**

- When did you kill the cover crop?
- How did you kill the cover crop?
- What did you plant next? How long after you killed the cover crop?

### **End of season Questions**

- What observations did you make following killing the cover crop?
  - o Related to: retaining soil moisture, weed pressure, pest pressure, presence of beneficial bugs, crop health
- Would you plant this cover crop again?

# Activity 4

4

TIME: 20 Minutes

## OVERVIEW:

Track cover crop benefits with farmers through the Summer growing season.

## MATERIALS NEEDED:

- Cover Crops Checklist Questions
- Cover Crops Benefits Tracker (Staff Tool)

## LESSON STEPS:

- Set aside time mid-season, after farmers have planted cover crops to ask them the mid-season questions related to the planting.
- After farmers have killed or terminated their cover crops, set aside time to review the checklist questions related to that.
- Finally, at the end of the season check with farmers for any observations they may have about their use of cover crops or reflections they may have on changes they might make for next time.

Farmer Name:	
Farmer Name:	
Staff Name:	Mid-Season Questions to be asked shortly after cover crop is planted
Date:	Cover Crop Planted
	Planting Date/Season
	Soilwater Conditions
	Previous Vegetative Crop in Rotation
	Seeding Technique: Broadcast, Driller, T/C, Other
Staff Name:	Mid-Season Questions to be asked shortly after cover crop is killed
Date:	Crop Termination Date
	Crop Termination Technique: Earth, Spike, Mow, Broadcast, Trench, Roll, Mower, Other
	Year Vegetative Crop in Rotation
	Planting Date of Vegetative Crop
Staff Name:	End of Season Observations
Date:	Soil Moisture
	Weed Pressure
	Rain Pressure
	Beneficial Bugs
	Crop Health
	Other

**Variation:** Soil improvement may not be apparent during the first season of cover cropping. Soil tests in the second and/or subsequent seasons could provide a clear, measurable demonstration of improved soil fertility. Before-and-after comparisons over two or more seasons can also help farmers see the effects cover crops on soil texture, soil water retention, and/or pest problems.