WHAT IS THIS USER’S GUIDE?

Trainers can use this teaching module to help farmers, either as a group or one-on-one, make a plan for seeding cover crops in their field, by selecting the best cover crop for their needs and determining the right amount of cover crop seeds to purchase and plant.

While there are many resources available on cover crops, there are few picture-based resources or simplified seeding calculators for use by non-literate or non-English fluent farmers. These resources can be utilized to help farmers plan for seeding cover crops in their field.
Who made this guide?

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VARIATION: Throughout this guide, boxes (like this one) contain variations and adaptations that serve varying programs and farmers. They are suggestions and reflections from other programs based on how they made this workshop work for them.

ICONS: You will find the icons below throughout this guidebook. They are there so you are prepared for the activity and can get an idea of what it will bring at a glance.

- Signs/Cards
- PowerPoint
- Worksheet
- Discussion
- Vocabulary
- Indoor
- Outdoor
- Talking Points
Is this guide right for you?

**AUDIENCE:**
- **Who:** Refugee farmers who are growing on a small-scale
- **Language / Literacy:** These resources would be best utilized with advanced literacy levels but could be utilized with an interpreter with other levels. Farmers without advanced literacy will require assistance with the Cover Crop Seeding Calculator.
- **Farming Experience:** Farmers who have grown in the United States for a couple of years.
- **Prerequisites: Skills, experience, and knowledge:** Reading a grid
- **Region/Climate:** Adaptable to all regions
- **Program Structure:** Any
- **Season:** Can be taught any time, but the off season is the best time to encourage farmers to plant cover crops during the growing season. Late Summer or Fall is best for farmers who want to plant winter cover crops.

**RESOURCES NEEDED:**
- **Time:** 30 minutes - 1 hour
- **Staff/Interpreters:** One staff with an interpreter.
- **Location:** Indoor Meeting

**Resources and Materials Needed to Complete this Module:**
- Computer
- ‘Cover Crop Calculator’ Excel Spreadsheet
- Cover Crop Flashcards printed from slides on ‘Cover Crop Flashcards’ PowerPoint

**Other Helpful Resources:**
5  OBJECTIVES AND SKILLS
   • Vocabulary
   • Objectives
   • Proof of Learning

6  LESSON 1 / WHAT IS YOUR EXPERIENCE? WHAT ARE YOUR GOALS?
   15 - 30 MINUTES
   • Farmers answer a series of questions to evaluate their past experiences
     with growing cover crops, identify their goals for their next planting of
     cover crops, and select the best cover crop or mix of cover crops to meet
     their goals.

10 LESSON 2 / USING THE COVER CROP CALCULATOR
   15 - 30 MINUTES
   • Farmers learn how to calculate the amount of cover crop seed they
     need to purchase and plant, through a demonstration and practice with
     the ‘Cover Crop Seeding Calculator’ Spreadsheet.
Objectives and Skills

VOCABULARY:
- Cover crop
- Seeding rate
- Ounce
- Pound
- Square feet
- Drill
- Seed drilling
- Broadcast

OBJECTIVES: By the end of this module, farmers will:
- Select Cover Crops that will meet their goals
- Calculate how much seed they should use for a good stand of cover crop

PROOF OF LEARNING: I will know that farmers have achieved learning objectives because:
- Farmers will be able to plan and implement cover crop use in their field
- Farmers will be able to understand how much seed they will need for the area they choose to cover crop
LESSON STEPS

1. Farmer’s Experience with Cover Cropping

• Start by asking the farmer about their experience with cover cropping.

• Prompting Questions:
  • What crops have you tried to grow?
  • When did you grow them?
  • Were you successful with this cover crop? What worked?

TIME: 15 - 30 Minutes

OVERVIEW:
Farmers answer a series of questions to evaluate their past experiences with growing cover crops, identify their goals for their next planting of cover crops, and select the best cover crop or mix of cover crops to meet their goals.

MATERIALS NEEDED:
• Cover Crop Flashcards
• Cover Crop Seed (if you have seed available, bring seed to pair with the flashcards)

OBJECTIVES / LEARNING:
By the end of this activity, participants will:
• Describe their goals for cover cropping.
• Know 1-2 cover crops that might meet their goals

VOCABULARY
• Cover crop
• Erosion
• Soil Compaction
• Beneficial insects
LESSON STEPS, CONTINUED

- What problems or challenges did you have?
- What observations, if any, observations did you make?

- Next, ask the farmers about their goals for planting cover crop.
  - Prompting Questions:
    - What benefit do you want from planting a cover crop? Or, what problem do you want to solve? You may remind them of some of the general benefits of each cover crop group (see chart below).
    - When do you want to plant it? Do you want to plant for Winter cover or Summer cover?

<table>
<thead>
<tr>
<th>Cover Crop Group</th>
<th>General Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mustards (Brassicas)</td>
<td>• Erosion Fighter: Reduce and prevent soil erosion</td>
</tr>
<tr>
<td></td>
<td>• Weed Fighter</td>
</tr>
<tr>
<td></td>
<td>• Pest Fighter</td>
</tr>
<tr>
<td></td>
<td>• Soil Builder: Reduce soil compaction</td>
</tr>
<tr>
<td></td>
<td>• Keep moisture in the soil</td>
</tr>
<tr>
<td>Examples: mustard greens, daikon radish</td>
<td></td>
</tr>
</tbody>
</table>
LESSON STEPS, CONTINUED

<table>
<thead>
<tr>
<th>Cover Crop Group</th>
<th>General Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans (Legumes)</td>
<td>• Nitrogen source: Fix atmospheric nitrogen which can be used for subsequent crops</td>
</tr>
<tr>
<td></td>
<td>• Soil Builder: Increase organic matter</td>
</tr>
<tr>
<td></td>
<td>• Erosion Fighter: Reduce and prevent soil erosion</td>
</tr>
<tr>
<td></td>
<td>• Attract beneficial insects</td>
</tr>
<tr>
<td></td>
<td>• Keep moisture in the soil</td>
</tr>
<tr>
<td>Examples: clovers, vetch, cow peas, snap peas</td>
<td></td>
</tr>
</tbody>
</table>

| Others (Non-Legumes)    | • Nitrogen Scavenger: scavenges the nitrogen that is left over from a previous crop                                                               |
|                        | • Soil Builder: Increase organic matter                                                                                                           |
|                        | • Erosion Fighter: Reduce and prevent soil erosion                                                                                                |
|                        | • Weed Fighter                                                                                                                                     |
|                        | • Keep moisture in the soil                                                                                                                        |
| Examples: winter rye, barley, oats, wheat, sorghum sudan, buckwheat |                                                                                                                                                  |

2. Cover Crop Flashcards

• Once the farmer has described their answers, use the cover crop flashcards and show them what crops might provide those benefits/solve that problem.

  • Discuss the details of the cover crop listed on the flashcard, including the potential challenges.

  • Next, ask the farmer to pick 1-3 cover crops from the flashcards that might work for his or her goals.
• The next steps will be to understand how much area the farmer wants to cover crop.

Note: The flashcards have general information about each cover crop from Managing Cover Crops Profitably (Clark, 2007). Trainers may want to add additional information that is specific to their region or experience or add additional crops that are not included in the existing flashcards.

Note: If you wanted to use this module with a group of farmers, it might work best to walk through the prompts, answering questions as if you were a farmer. If you were to do this, you might need to adapt the lesson to ensure that all farmers were engaged.
Using the Cover Crop Calculator

TIME: 15 - 30 Minutes

OVERVIEW:
Farmers learn how to calculate the amount of cover crop seed they need to purchase and plant through a demonstration and practice with the ‘Cover Crop Seeding Calculator’ Spreadsheet.

MATERIALS NEEDED:
• Computer
• Cover Crop Calculator Excel Spreadsheet
• Scale
• Cover Crop Seed

OBJECTIVES / LEARNING:
By the end of this activity, participants will:
• Know how to calculate the area that they want to cover crop.
• Calculate how much cover crop seed they will need for their plot.
• Practice measuring cover crop seed using a scale.

VOCABULARY:
• Seeding Rate
• Drill
• Seed drilling
• Broadcast
• Seeding Rate
• Pounds (lbs)
• Ounce (oz)
• Square feet (sq ft)

Note: this lesson uses the word “row”. You may find it more appropriate to use the term ‘bed’. Use whatever farmers in your program may be more familiar with.
LESSON STEPS

1. Seeding Rates Background

- You may choose to discuss the following with the farmers so that they understand more about how the seeding calculator determines the amount.
  
  - According to Morris J. Houck, Plant Materials Specialist of the NRCS, the seeding rate is “the amount of seed of an individual species that’s needed to achieve an adequate stand.”
  
  - To paraphrase, the seeding rate is how much you need to seed in order to get a good planting.
  
  - There are lots of resources that have seeding rates for cover crops and there are different rates for different ways of seeding the cover crop. We have compiled this information and created a seeding calculator to help you determine the amount of seed you will need for the space you want to cover crop.

2. Calculating Seeding Rate

- Depending on the individual you are working with, it might be important to discuss the process for calculating the area of the space to be cover cropped: Now that we’ve talked about the types of cover crops you can use, the question you might ask yourself is ‘How much seed will I need?’ And to determine that you’ll need to figure out how much space you want to cover crop.

Note: If you are doing this lesson in the field, this is a great opportunity to demonstrate this example. Even if you are doing this in a classroom, you can use a large piece of butcher paper to act as a row and have volunteers measure the width and length.
• Your first step in determining how much seed you will need is to figure out the area of the row that you want to cover crop.

• Invite farmers to share their experience and knowledge. What units of measurement have they used in the past? Explain that typically in the US, the common unit of measuring length and width is feet.

• How do we measure the area? Ask for two volunteers to use the measuring tape to measure the width and length. Capture this on a whiteboard, piece of paper or on the butcher paper, if using.

  • What is the width of each row?
  
  • What is the length of each row?
  
  • When you multiply those two numbers together, you get the total number of square feet, the “area”.

3. Spreadsheet background

• There are five different spreadsheet tabs: four information output tabs that are linked by formulas and an information tab with cover crop seeding rates.

Note: All the spreadsheets are linked, so, if you do any editing to the document, you’ll want to be sure to pay special attention to the formulas. The cells that are highlighted in blue are cells with formulas and calculate automatically. Any information that you input will go into a cell highlighted in red.
The first spreadsheet tab, Cover Crop Calculator (B) (Figure 1) will determine the rates that the farmer needs if broadcasting seed, based off the area they are seeding and cover crop they have chosen.

![Figure 1. Snapshot of Cover Crop Calculator (B)](image1)

The second tab, Printable Results (B) (Figure 2), will generate a printable simplified version of the rates for broadcasting with larger font that you can print and give to the farmer.

![Figure 2. Snapshot of Printable Results (B); this sheet can be printed off and given to farmers.](image2)
The next two spreadsheets, **Cover Crop Calculator (D)** and **Printable Results (D)** are identical but provide rates and results that the farmer needs if drilling the seed rather than broadcasting.

The last spreadsheet, **Input Seeding Rates (Figure 3)**, is where base data on seeding rates by cover crop and by seeding method is located.

**Figure 3.** Snapshot of Input Seeding Rates; data on seeding rates is here, and populates the earlier tabs.

### 4. Entering information into the spreadsheet

- Farmers will need to know the following information to enter information into the calculator:
  - how many rows will be cover cropped,
  - the length of those rows,
  - the width of those rows,
  - the cover crop type, and
  - the seeding method.
• Based on the farmer’s choice of seeding method, enter the gathered information on bed rows, width and length into the first spreadsheet tab “Cover Crop Calculator (B)” or third tab “Cover Crop Calculator (D)” in the upper left box.

• Select the cover crop of their choice from the dropdown menu directly below this box.

• The amount of seed they will need for their selected beds will self-calculate, and appear in the box “What amount would I need for...” It will also appear on the following tab “Printable results.”

• After you walk through the seeding calculator with the farmer, you can help the farmer understand the costs of this amount of cover crop by researching together on the internet. If the farmer picked multiple crops, this is an additional way for the farmer to be able to compare the crops to determine what to plant.

• It could also be beneficial to have cover crop seed on hand and practice weighing out the seed with the farmer.

Note: If you had the time and resources, you could add a field component where the group of farmers went through the whole planning process together and finished by seeding cover crop together.