CROP PLANNING

TRANSPLANTING TRADITIONS COMMUNITY FARM, CHAPEL HILL NC

Summary

This guide covers essential components of crop planning. Participants will learn how to fill out and complete a production plan, determine transplants needed, complete a seed order using the seed calculator tool, and weigh and bag direct-planted or direct-seeded crops. At the end, farmers will be prepared with all their seeds for spring and summer planting and the crop production information needed for the upcoming year.

The need: This system enables farmers to follow through on a complex and thorough crop production plan, giving them the tools needed for increased independence. If completed during winter, this system saves time and reduces mistakes during the growing season.

Who made this guide?

Collaboration and Testing

ACKNOWLEDGMENTS: This teaching resource was developed by Kelly Owensby of Transplanting Traditions Community Farm, in partnership with the Institute for Social and Economic Development (ISED Solutions). Refugee farmer training programs across the country provided feedback on this lesson, which is now integrated throughout the guide. From 2015 to 2017, ISED partnered with twelve refugee farmer training programs through a USDA BFRDP educational enhancement grant, to support the design and testing of new and shareable teaching resources for culturally and linguistically diverse farmers. To learn more about this project, or to access the whole list of newly developed teaching resources for refugee farmer training programs, see the New American Resource Library at https://nesfp.org/new-american-resources. For more in-depth explanations of the teaching approaches and activities used in these materials, please see the 'Refugee Farmer Teaching Handbook'. While these resources were designed with refugee audiences in mind, they can be adapted and used in any farmer training or incubator setting.

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.

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.

DEVELOPER'S NOTE: Throughout this guide, boxes (like this one) contain notes from this guide's developer that provide insight into how a lesson is typically taught at the developer's program.

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.

| WORKSHEETS | VOCABULARY | TALKING POINTS | INDOOR | DISCUSSION |

Reviews and Core Skills

WHAT TESTERS SAY:

"Good structure/progression. Glad that there are both farmer and trainer materials. The resource outlines pitfalls to look out for, and where to expect farmers might get confused." - *Hannah, All Farmers, CT River Valley, MA*

"This motivates us to develop our system further with more work on how we teach successions in relation to creating a calendar and weighing separate bags for seeds." - *Global Greens, Lutheran Social Services in Iowa*

"We would ideally pair with a planning tool for market as well as CSA, since for market growers we try to have a lot of crops that sell well or get a good price, whereas with CSA overall variety is more important." - *Katie, Global Gardens in Boise ID*

CORE SKILLS:

- Succession planning
- Reading a grid
- Basic calculations
- Vegetable name (reading and writing)
- Reading a calendar
- Months and days naming
- Seed amount calculating and ordering
- Seed spacing
- How much to plant
- Grams, ounces (weights)
- Calculating Bed feet per crop

Table of Contents

Adaptable except where noted.

DEVELOPER'S NOTE:

This class is designed to be delivered in installments. Each activity introduces a new tool and should be done when it is seasonally appropriate (spring planning and seed calculator before the growing season starts, and fall planning before fall, etc.)

Audience and Objectives

Adaptable except where noted.

OBJECTIVES: **At the end of this module, growers will be able to:**
- Choose varieties, quantities and succession dates for all crops.
- Adapt their own planting plans, calendars, seed orders, and variety selection.
- Conduct basic calculations to determine the number of seeds needed using addition and simple division.

WHO: **Refugee farmers and growers**
- This is a good launching point for new farmers with some growing experience (including in home country), who are unfamiliar with crop production planning or marketing in the U.S.
- New farmers aiming to participate in a CSA are encouraged to use this tool.

TEACHING TIP:

> This is a crop planning for CSA toolkit and does not include planning for market and wholesale. However, the principles of this tool can be used to plan more generally, and do not need to be used exclusively for CSA.

LANGUAGE / LITERACY **Emerging to developing language / mixed literacy**
- Language can be adapted to beginning levels if an interpreter is present at all sessions. Support staff can help pre-literate farmers fill out planning sheets. Non-literate farmers may need help in the beginning but can learn quickly.

DEVELOPER'S NOTE:

> We teach this guide to a group of 4-6 advanced farmers, two of which are low-literate. Have one staff member teach and another staff member assist the two low-literate farmers with filling in the crop production plan. It works well for the low-literate farmers to be mixed in with higher literacy farmers so that they can help each other out. If farmers can read, write and understand numbers, this tool can be used.
>
> Because of the literacy level of the farmers in our program, we would do one-on-one sessions with our farmers to use these tools. However, farmers can learn quite well from each other if they are at different literacy levels so there is always the opportunity to use small groups.

FARMING EXPERIENCE: **At least 1 year experience farming in U.S.**
When broken down adequately, concepts can be understood and used by a first-year farmer.

PREREQUISITES: **Skills, experience and knowledge**
- Using a table or grid (reading left to right and top to bottom)
- Using a calculator (addition and division functions)
- Using a gram scale
- Moving back and forth referencing two documents
- Matching and copying English variety names

TEACHING TIP:

> This is best for farmers with prerequisite knowledge of using a table or grid format (although color coding helps) and using calculators. Therefore, best for farmers with some higher literacy skills, or with one-on-one attention for beginning literacy farmers.

REGION / CLIMATE: **Southeast**

PROGRAM STRUCTURE: **CSA, not aggregate**
- CSA is not aggregate and farmers are completely responsible for filling their individual customers' CSA boxes.
- CSA is devided into three 8 week sessions with a one week make-up session between each season for a total of 27 continuous CSA harvest weeks
- Average of 5-7 farm families grow for an average of 110 CSA customers

Adaptable with considerable work
To use this tool for wholesale or aggregate CSA, farmers would complete sections for individual crops grown. The number of plants (column A of crop plan) and unit of measure (CSA boxes column B) could be edited as needed.

SEASON: **Pre-Season or Mid-Season (not adaptable)**
Completing module pre-season ensures farmers have time to get seeds before the season starts. Farmers will want to plan for fall during Mid-July to Mid-August.

ADAPTATIONS: **Feedback from reviewers and testers**
It is challenging to adapt this planning kit to a different model of selling (aggregate CSA). For example, the seed calculator and parts of the crop production plan might be useful with considerable changes to the calendar for your region or changes to other tools to match your system. For different systems, it could be more feasible to use this guide in smaller groups or one-on-one to adapt the concepts and make it more useful to participants.

Resources needed

Adaptable except where noted.

TIME: **4 sessions (3 hours each)**
Can condense into 2 sessions (3 hours each) if the seed calculator tool is not used.

STAFF / INTERPRETERS : **One primary and one support staff**
Interpreter required for first session or more sessions based on farmer language levels. If all farmers are beyond the "developing" level, an interpreter may not be needed.

LOCATION: **Classroom space with tables and chairs**

SUPPLIES: **Each farmer should recieve**
- A three-ring spiral binder with dividers, containing
    - Their spring and summer crop production plan (Fall plan comes later, see users guide notes)
    - A separate folder with their seed calculator tool and planting calendar

Additional materials and resources include
- Users guide (for the facilitator)
- Calculators for each farmer
- Pencils and erasers for each farmer

For the Seed Calculator
- Gram scales
- Plastic bags for seeds
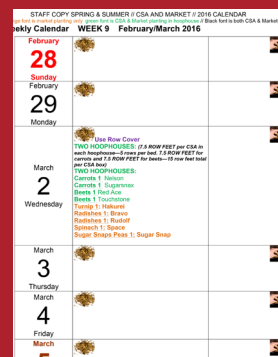- Labels for seed bags

SPRING PLANS   SUMMER PLANS   SEED CALCULATOR TOOL   PLANTING CALENDAR

COLUMNS IN CROP PLANNING TOOL

Column A: Crop production plans are divided into two sizes for farmers doing 1-9 CSA boxes and farmers doing 10-20 boxes. The numbers in Column A (number of plants per CSA box) have a built-in buffer because usually we lose some crops to pests, disease, etc. If that buffer is 1.5 plants per CSA box and a farmer is doing 20 CSAs then that buffer becomes 30 extra plants (20 x 1.5) which is likely too much space and will not get sold. But, if a farmer is only doing 6 CSAs, then the buffer is 9 extra plants (6 x 1.5) which is more appropriate. Given this, the buffer for 10-20 CSA boxes is less. To increase accuracy, you could divide the guides up into more size categories. E.g., for 1-5 boxes, 6-10, 11-15, etc. However, it is difficult to have even two guides because if you make a change to one you must make it to all of them. It is not crucial that farmers understand the buffer concept to use the tool. Only advanced farmers might want to understand it enough to alter the number in column A.

Column B: Here farmers will fill in how many CSA boxes they are growing for. Begin by explaining this to farmers and have them fill in their number all the way through every page in the crop production plan.

Column C: Column C is where farmers must get out their calculators. We begin with a short lesson on how to use a calculator, and have a calculator projected on power point slide so facilitator can point to the relevant symbols. Column C gives the total number of seeds or plants they need to plant for that crop succession. They multiply Column A by Column B and enter the number into Column C. If farmers are struggling with this concept or if there is a time crunch, you can stop once they have completed Column C and be finished with the tool. Advanced or more educated farmers may finish Column C quickly and it can be helpful to have a staff member ready to teach them Column F, even if the rest of the group is still on Column C.

Column D: This tells the farmer how far apart to plant the crop.

Column E: This tells the farmer how many rows per bed to plant the crop.

Column F: Column F will tell a farmer how many bed feet this crop will take up. This is useful for planning and bed prep. They must do a lengthier calculator entry but the math is simple. Have them fill out Column C before going on to Column F so they can repeat the same calculation, instead of switching between two different equations for Columns C and F.

Column G: The last column is where farmers put the date that they plant the crop. It takes reminding to get farmers to do this but is very useful when they ask us questions later on. It makes this a very rudimentary record keeping tool.

÷ Column: Here farmers will fill in the varieties they are planting, referencing the calendar to know which varieties to plant. They need to divide the number in Column C by the number of boxes (or the number next to the division symbol).
  • It is best to divide this column into two steps:
    • Step one: Farmers do the division and write the resulting number in the top of the box. Complete this first before writing in the variety name.
    • Step two: Consult the planting calendar and write the variety name by succession. They can look at the planting calendar and find (for example) Tomato 2 and fill in the 8 varieties. See the filled-out farmer crop production plan for reference.

PLANTING CALENDAR

The planting calendar is organized by first stating the vegetable name, the planting succession, and then the variety.

For example, **Turnip 1 Hakurei** tells us that this is our first planting of turnips and we will be planting the Hakurei variety.

This organization is important so it can be transferred in an organized way to the crop production plan. Consistency is key across these three tools.

Spring Crop Planning 1

TIME: 3 Hours

OVERVIEW:
Introduction to crop production and planting calendar tools for **Spring Crop** planning. Farmers will discuss why planning is important, and will learn how to plan a growing season.

MATERIALS NEEDED:
- Three-ring binders containing Spring and Summer Crop Production Plans
- Separate folders containing seed calculator tools and planting calendars
- Calculators
- Pencils and erasers

OBJECTIVES / LEARNING:
By the end of this activity, participants can:
- Understand roles of the crop production and calendar tools and how they work together.
- Complete **Spring Crop Planning Guide**, 50% of the work independently done (based on language and literacy levels).

VOCABULARY

Succession	Direct Seed	Buffer
Bed Feet	Transplant	Variety

STEP 1:   INTRODUCTION TO CROP PLANNING TOOL

TEACHING TIP:

> Open with reflection questions: what did you have too much/too little of last year? How much more/less of those crops do you want to grow this year as a result?

a.   Introduce the resource and explain rationale and purpose of the tool.

b.   Project crop production plan onto a slide or overhead and have farmers follow along using their paper copy. Introduce farmers to the information in columns A, B and C, and ask them to point to different columns or words to check comprehension.

c.   Explain that crop production plans are divided into spring, summer and fall, and that they will complete one plan per session.

d.   Explain the tomato and buffer column to farmers: the first tells what the crop is and what succession it is (e.g., Tomato 2 means a second planting of tomatoes). The second column tells farmers whether they will be planting seeds or plants, which is important when using the seed calculator tool.

e.   The words 'SEED' and 'PLANT' are color coded so non-literate farmers can recognize information by the color. Quiz farmers on comprehension, making sure they understand what Tomato 2 vs. Tomato 3 means. It can help to look at the planting calendar and see that Tomato 3 is planted after Tomato 2, and to

discuss why we do succession planting (continuous harvest).
- Ensure that the header rows repeat in Excel so the farmer can easily and consistently see them at the top of each sheet.
- If literate, farmers are encouraged to write the column meaning in their own language in the space provided. The pictures in the row headers are meant to jog the memory of non-literate farmers but their meaning should be explained first.

f. Teach farmers to use the table/grid format of the crop production plan. Evaluate comprehension by quizzing farmers on information on information (e.g., "How many rows to a bed for carrots?")

g. Have farmers fill in information and do calculations for columns A, B and C.

STEP 2: PLANTING CALENDAR BINGO!

ABC

Take a break to play Planting Calendar Bingo! This will help them fill their plan with variety names.

STEP 3: INTRODUCTION TO PLANTING CALENDAR

a. Introduce the planting calendar and teach farmers the format of vegetable name and succession number, followed by variety.
- See example: **Radishes 1 Rudolf**

b. Introduce farmers to the ÷ column and begin filling in the amount of seeds or plants needed by variety. The divided number (amount from column C divded by number of varieties) is written at the top throughout the entire plan. Once that is complete, farmers look at the planting calendar to fill in variety names.

c. If farmers are ready, they can be introduced to columns D, E and F and do the calculations for F.

d. Emphasize that they should fill out the final column with the check mark during the season, as planting occurs. Follow up with farmers during the season to help them get in the habit of filling out this column, which can double as a rudimentary record keeping tool.
- Encourage farmers to complete one step completely before moving on to minimize switching back and forth between concepts.

TEACHING TIP:

Math can be too abstract a concept for some farmers, but using their experiences and real life objects can make it more concrete. For example, when farmers see/feel a seed packet, they have any idea how much of a crop they can grow from that., and about how much space those seeds will fill up. The challenges remaining are in helping farmers translate their experiential knowledge into, for example, placing a seed catalog order or planning for successions.

Summer and Fall Crop Planning

2

TIME: 3 Hours

OVERVIEW:
Similar to Activity 1, farmers will complete the **Summer Crop Production Plan**. Farmers will review the importance of planning for a successful growing season.

MATERIALS NEEDED:
• Three-ring binders containing Spring and Summer Crop Production Plans
• Separate folders containing seed calculator tools and planting calendars
• Calculators
• Pencils and erasers

OBJECTIVES / LEARNING:
By the end of this activity, participants can:
• Understand roles of the crop production and calendar tools and how the work together
• Complete **Summer Crop Planning Guide**, 50% of the work independently done (based on language and literacy levels).

VOCABULARY
Review vocabulary from Activity 1.

LESSON STEPS

Follow Lesson Steps 1 - 3 for Activity 1, but instead of filling out the **Spring Crop Production Plan**, fill out the **Summer Crop Production Plan**.

Spring Seed Calculator Tool

TIME: 3 Hours

OVERVIEW:
Farmers will figure out how many seeds are needed for each crop in their **Spring Crop Production Plan**. They will determine seed weights and learn about amounts vs. numbers of seeds using a gram scale. They will weigh, bag and label their seeds.

MATERIALS NEEDED:
• Folder with all crop production, calendar and seed calculating tools

• Completed **Spring Crop Production Plans**
• Gram scales
• Calculators
• Plastic bags for seeds
• Labels for seed bags

OBJECTIVES / LEARNING:
By the end of this activity, participants can:
• Fill out the seed calculator tool and weigh out seeds appropriately.

VOCABULARY
Gram   Succession

STEP 1:   SET UP (FACILITATOR)

TEACHING TIP:

> It saves time to have farmers weigh their own seeds. Also, if farmers learn to calculate how much seed they need, with more training they can order seeds for themselves.

a.   Remember that the amount of seeds was calculated in earlier workshops using farmers' crop production plans.

b.   Set up weighing stations.

DEVELOPER'S NOTE:

> At Transplanting Traditions Community Farm, we have 4 gram scales (costing $26 each) and set up stations so that once farmers have filled out their Seed Calculator Tool they can weigh out their seeds and make a label (we printed labels ahead of time). The label would say "**Turnip 1 Hakurei**" and would go on a bag containing the appropriate amount of seeds.

c.   It is important that farmers bag successions of seeds separately. For example, a second bag would say "**Turnip 2 Hakurei**."

Buy seeds in bulk and sell them back to farmers at cost. Look at their seed calculator tool, note how many grams of each seed they bought and charge them accordingly. There is a tab on the seed calculator tool that includes seeds per ounce and pound (in addition to gram) as well as cost per gram for calculating cost. The cost will vary with different seed companies.

STEP 2: INTRODUCTION TO SEED CALCULATOR TOOL

a. When filling out the Seed Calculator Tool, have farmers identify which crops in their plans will be direct seeded.
   - This is a place for error. Have farmers go through their crop production plan and **circle** where they see the word SEEDS. (SEEDS is orange in color which may help them identify the word.)

b. Next, take the total number of seeds from column C of the C**rop Production Plan** and fill it into column C of the **Seed Calculator Tool**.

c. This step is the most challenging. Have farmers look at their crop production plan and put a number in column F for each time they plant of that crop. These numbers represent successions and will indicate the number of bags of seeds they will end up weighing out for that crop.
   - When farmers fill in column F of the seed calculator tool they often are filling in for several succession plantings. First, have them count how many successions of a crop they are doing (e.g., 4 successions of radishes). They can see this in their crop production plan. They then write in 1, 2, 3, and 4 in column F and **CIRCLE** those numbers to ensure they are not confused with the number of grams they are about to write next to that circled number.

TEACHING TIP:

The number of seeds in the Crop Production Plan in column C sometimes changes based on the succession. For example, we have two farmers who do farmers market and CSA. Because the farmers market starts before the CSA, their first plantings are smaller. Once the CSA starts (later succession plantings) they will need to plant more to accommodate CSA and market, so later successions are larger plantings.

d. Have farmers do the math (column C divided by column D) and fill it in for each time in column F.

TEACHING TIP:

Be sure to check farmers' crop production plans BEFORE they weigh out seeds to avoid math mistakes. If you catch a mistake in their crop production plan later on, double check their math on the seed calculator tool and have them re-weigh their seeds.

e. At this point, show farmers visually what the information in column D means by weighing out a gram of beans (usually 4 seeds) and then something small, like Arugula (456 seeds). Explain that this number tells us how many seeds are in a gram. Depending on farmers' levels of comprehension, this might take several demonstrations using different examples to communicate the basic idea.

Summer Seed Calculator Tool & Reflection

4

TIME: 3 Hours

OVERVIEW:
As in Activity 3, farmers will determine number of seeds needed each crop, focusing on their **Summer Crop Production Plan**. They will determine seed weights and learn concepts of amounts vs. numbers of seeds using a gram scale. They will weigh, bag and label their seeds for that season.

MATERIALS NEEDED:
• Folder with all crop production, calendar and seed calculating tools

• Completed **Summer Crop Production Plans**
• Gram scales
• Calculators
• Plastic bags for seeds
• Labels for seed bags

OBJECTIVES / LEARNING:
By the end of this activity, participants can:
• Fill out the seed calculator tool and weigh out seeds appropriately.

VOCABULARY
Review vocabulary from prior Activities.

STEP 1:   SEED CALCULATOR TOOL

Follow the steps in Activity 3 but instead of the **Spring Crop Production Plan**, use the **Summer Crop Production Plan**.

STEP 2:   REFLECTION AND DISCUSSION

If there is time, do an overview of the tools and how they work together. Ask questions to test comprehension.

a. Quiz farmers on difficult concepts. Have them look at column F in the seed calculator tool where there are several succession plantings (e.g., for Radish) and ask, 'What does the circled number 3 refer to in your crop production plan?"
   • This requires them to work backwards and think about how all the tools are linked.

b. Ask farmers, "When do we plant Radish 3?" This refers to the circled number 3 next to Radish in their seed calculator tool. They must look at their planting calendar to find that date.