Training of Trainer’s Seed Saving Primer
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Organic Seed Alliance (OSA) is a non-profit organization in the United States. OSA's mission is advancing the ethical development and stewardship of the genetic resources of agricultural seed.

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INTRODUCTION

Welcome to the Training of Trainers Program. Thank you for investing in a secure and diverse seed system through your commitment to spreading accurate seed saving knowledge. The curriculum, with its component parts provides a comprehensive training tool. As a trainer, you will develop the capacity to create learning experiences for others. The goal is twofold: 1) to fully engage participants in seed saving concepts and practices so they will retain what they learn and continue practicing it, and 2) to train seed saving instructors (the trainers) to spread this important skill.

Presenters will continue to refine the program, and update this guide, based on feedback from trainers and participants. The development of this curriculum is an ongoing process and the collaboration between USC-Canada and OSA.

How the Training of Trainers Program is Structured: The program has two nested functions. Principally, it is a curriculum for teaching seed saving workshops. Those workshops will provide participants with the basic information and processes needed to save seed. The Seed Saving Curriculum, divided into 6 modules or lesson plans can be adapted in several ways. It is designed to provide instruction at both the basic and intermediate seed saving level and includes an array of activities and materials that enhance the training. A major component is the PowerPoint (PP) and all materials can be tethered to it. The lesson plans have been designed for use in the field—a garden or farm setting—without the PP, or in a classroom with the PP. The lesson plans are included in the primer and also are available in a separate PDF for easy copying. The OSA Seed Saving Guide for Gardeners and Farmers is the reference source recommended for the workshop. Presenters comfortable with a different reference can alter- nately provide that to trainers and participants.

At a second level, the program outlined in this primer includes a curriculum to train people how to teach seed saving. The Trainer’s Curriculum describes the trainer’s role and responsibilities, provides teaching methods, and principles of effective com- munication that can be used by experienced seed savers to teach seed saving to future instructors.

For the sake of clarity we will use the following terms. Presenters are experienced seed savers who act as mentors and deliver training workshops; they train the trainers. The trainers begin by learning the materials in the Seed Saving Curriculum and the teaching methods in part one of the primer. Trainers then go on to conduct workshops, sharing seed saving practices and concepts. Participants are people taking the seed saving workshop. Participants can become trainers, and trainers can become presenters.

Recommended options for using this primer: A key goal of this training program is to provide consistency in seed saving workshops while also providing flexibility to meet the different needs of participants. Furthermore, the level of experience of the trainers will guide how both of these curricula are used. Ultimately, whether trainers use the PowerPoint presentation, adapt it, or decide not to use it, they must be familiar enough with the material and the seed saving curriculum to assure that their workshop is consistent with the program. It is important for trainers to review the material prior to leading each workshop.

The Training Curriculum can, and must, be adapted to the experience level of the trainers. For example, if the potential trainer has only some seed saving experience, he could first attend the One-Day Seed-Saving Workshop as a participant to become more familiar with the material presented in the workshop. The next day he could attend the training workshop offered by a presenter to review the curriculum, learn teaching skills, practice leading the different learning activities, participate in group activities and/or use reflective journaling to discover what works best for him based on his learning and teaching style.

Alternately, if the presenter is working with trainers who are more experienced seed savers, she could customize the training curriculum to simply review the contents of the PowerPoint and spend more time exploring learning activities. These trainers would look at new models of learner-centered education and practice teaching skills including public speaking, leading activities, fielding questions, and time
management. The next day, several trainers, under the guidance of a presenter could lead a seed-saving workshop for the general public.

As a third option, individuals who are already experienced in teaching seed saving, could review all the material on their own.

**Goals of the Training of Trainers Seed Saving Primer:**

1. Develop an expanding pool of trainers capable of using and adapting the Seed Saving Curriculum.
2. Assure that seed saving workshops provide accurate, useful, and consistent information.
3. Expand the public’s skill, knowledge, and appreciation of seed saving.
4. Expand the production and conservation of high quality local and bio-diverse seed.
5. Utilize workshop feedback to further improve the program.

**PART I: TRAINING OF TRAINERS**

1. **Pedagogy**

Pedagogy refers to the method and practice of teaching. Current research has shown that we learn best when we are engaged. Listening to long lectures is not as effective as listening and then doing an activity, or solving a problem, or reflecting and writing about what we have learned. The more styles of training you can load into a learning experience the better everyone learns. Individuals may have certain brain-style preference for learning styles, so everyone learns when multiple approaches are offered. The pedagogy of this training curriculum was developed based on this assumption.

Think of participants as active agents, not just people acquiring knowledge. Think of the trainer as a coach guiding the process. The goal is for people to fully engage so what they learn can be practiced again, with confidence. Offer some information and then let participants engage. Real learning is the ability to use information to solve problems that arise and to retain it long after the initial practice. Participants commit to making the knowledge their own through continued practice.

This is one reason the PowerPoint does not come with a script out of the box. This is an opportunity for you as a trainer to really hone your skills and make the workshop a reflection of your knowledge. It is better for participants to grasp a few ideas really well than to be flooded with information that is beyond them. Know your audience and you will know what level of depth to explain underlying principles. The primer provides questions to gauge participant level. When the group you are training has a similar skill set and interest level, you can select which slides in the PowerPoint or Lesson Plans to skim over and which to focus on. Recommended activities have also been geared to different levels.

2. **Trainers’ Role and Responsibilities**

*It’s the action, not the fruit of the action, that’s important. You have to do the right thing. It may not be in your power, may not be in your time, that there’ll be any fruit. But that doesn’t mean you stop doing the right thing. You may never know what results come from your action. But if you do nothing, there will be no result.*

Mahatma Gandhi (1869-1948)

Trainers take on a leadership role. They are responsible for creating a trusting environment so participants can learn. As a trainer, you will be presenting information, encouraging questions and engaging participants in activities. Trainers are not expected to know everything. If you convey a sense of relaxed awareness, participants will relax too. The more you develop ease with challenges that arise, the more the group will feel comfortable. The ability to plan ahead and encourage others to participate and engage in the plan requires leadership skills. Everyone can benefit from developing a level of confidence and competency in leading others.

**Logistical Responsibilities**

*Trainers are responsible for being organized:*

Have a protocol: clearly explain the day’s agenda,
and describe logistics (bathrooms, food, parking, cell phones off) so participants have a sense of ease and you are able to avoid distractions while you teach. State your intention for the group to have a productive day together. Explain that activities are more than entertaining times to stretch; they are essential components that reinforce new concepts. Handle any logistical issues participants might have. Starting the day this way demonstrates to the group that the workshop will be an effective use of their time. An organized trainer will cultivate the group’s respect and attention.

Trainers are responsible for preparing the training: The Training of Trainers program offers a wide array of materials to adapt to a specific seed saving workshop. The garden cart inventory list is a useful tool for organizing materials to bring to the event. The lesson plans form the backbone of the curriculum. Create your own notes or script for the PowerPoint. Assemble participant folders including a printed copy of the OSA Seed Saving Guide or an alternative seed saving guide if there is one you prefer.

Know your audience’s skill level. You may advertise your workshop toward a specified audience, for example, beginning seed saving for gardeners, or intermediate seed saving for farmers, in order to attract participants of a certain level. Alternately, you may want to advertise the workshop more broadly and then gauge participant’s skill level through questions on a registration form before the workshop. Finally, you can assess the audience on the day of the event through introductions, but in this case you will need to be able to adjust your instruction and discussion accordingly without time for prior preparation. Determine the participant’s general skill level and gear the workshop accordingly.

Plan for the size of the group; 20 participants can be a comfortable size to work with. Workshops in the field with more than 20 people may require a megaphone. Larger workshops offered indoors benefit from support staff. These assistant trainers can be a real help in guiding activities. Determine the following variables and select accordingly: indoors or farm and garden setting, and the season the workshop is offered. If you are uncertain about topics review OSA’s Seed Saving for Gardeners and Farmers Guide. The logistics section in the primer provides additional information.

Trainers have the responsibility to manage time and keep the group on task: Use your discernment. Let the group know that there is a lot of material to cover and that we will need to keep to the schedule to cover it all. If questions come up that will be covered later in the workshop you may want to ask participants to be patient and hold off on that topic. If discussions are wandering off topic or going over schedule, you may ask participants to table the discussion for after the workshop or during a break. If time is being spent on worthwhile topics that participants want to explore, consider your options. Put it to a vote. Tell the group that there is a tight schedule and while you are willing to take time away from the scheduled agenda, determine what priorities require attention and what material can be dropped. Determine ahead of time what material can be omitted if the workshop runs late. Always give priority to topics that include a hands-on component because engaged participants learn more than passive ones. Participants will be more engaged and committed if the trainer mentions why they are being asked to do a specific activity. Be sure to announce the activity objective listed in the lesson plan.

Toward the end of the day if the group’s attention wanes encourage them that they have covered a lot, there are some final concepts to touch on, and that you are almost done.

Leadership Responsibilities

Trainers are responsible for establishing a positive environment and a sense of cooperation. Adult learners might feel vulnerable and thus hesitate to open up in a workshop. The introductions in the opening module are an opportunity for each participant to say something about who they are in a role other than a learner. Some people need that recognition of their experience and expertise before they can relax. During the PP presentation ask questions to determine if participants are keeping up with the information. Always respond positively, even if the answer given is different from your expectation. Provide praise and encouragement. Trainers can encourage a sense of safety.
Trainers have the responsibility to engage with the participants. Invite people to share their thoughts. Remind participants there is a full day and ask them to keep their comments brief. Engaging with the participants includes such basics as not turning your back to the group and speaking to the screen or the flip chart. Far more important is how a trainer field’s questions and comments. Don’t ignore them. Respond and notice if you are getting frustrated or defensive. See the tips below for how to defer questions. Encourage but do not force everyone to participate in activities. Remind participants that by engaging their senses they reinforce what they are learning.

Trainers have the responsibility to be honest. Admit when you don’t know something and offer to find out either after the class or during a break. Or ask the person to email the question to you. Becoming defensive signals to the listeners that you are unsure of the facts, and participants, may lose confidence in your ability. No one expects you to know everything. Relax.

3. Developing Effective Training Skills

Effective communication comes naturally for some and is a learned skill for others. But for all trainers, practice will improve your teaching skills. The more workshops you deliver the better you will be able to articulate principles, respond to questions, and facilitate discussions. For new trainers, whenever possible give your first seed-saving daylong presentation with a presenter or a co-trainer. If public speaking is not your forte then just present the easier parts, letting the more experienced speaker give the introduction and lead the activities. Take turns with the PowerPoint. The more relaxed speaker can present the complicated concepts. As a new trainer taking a less active role, you have the opportunity to develop good listening skills as one step toward improving your communication skills.

A. Practice Before Delivering a Workshop

1. Practice, practice, practice -- the more you practice talking through the material, the more comfortable and clearly you will be able to teach.
2. Use a recording device and note if you speak clearly in a well-modulated voice.
3. Practice giving part of the workshop to family or friends. Ask for feedback.
4. Smile, speak clearly and at a relaxed pace, pause after making key points.

B. Tips for Presenting a Workshop

1. Be well rested, and relaxed. Some people feel more confident when they are well groomed, while others enjoy wearing their everyday work clothes.
2. Avoid reading the slides: they should provide talking points and headings. As the trainer you can explore the topic and elaborate with supporting points and anecdotes.
3. While speaking make eye contact with participants. Look directly at people for several seconds, it helps them feel seen and keeps them engaged.
4. Encourage participants to talk about concepts, to figure out what they do or don’t understand.
5. Relax, relax, relax, and enjoy yourself. That way the participants will also become more relaxed and enjoy themselves—and probably absorb more information.
6. Humor helps everyone to relax. Tell one-liner jokes.
7. Keep it real -- always relate theory to practical experience. Describe the mistakes you have made in seed saving. Tell stories to demonstrate your points.
8. Know the material well enough to be able to improvise.

C. Communication Skills

The following advice for developing good communication skills is based on learning theories and the experience of other trainers. There is no one correct way to lead a workshop. Some people have a charismatic quality, while others can find humor in everything. It is important to honor your own presentation style. Review these suggestions, practice some and decide what to adapt into your repertoire.

**Principles of effective communication:**

- Use language the listeners understand.
- Clear concise sentences are easiest to understand.
- Present information in simplest manner possible.
- Present information in a logical order.
- The objective is for the listeners to gain insight into the details.
- State the purpose, this encourages listeners to pay attention.
• Rephrase it with expressions like: “The point I want to emphasize…”, “In other words…”, “My main concern with this technique is…”.
• Use supporting points to strengthen main point.
• List supporting points first, then return and provide details.
• Use colorful explanations and visual aids.
• Use reasoning that is familiar to listeners.

**Check to see if listeners understand the message:**
Use phrases like,
- “Can anyone give me an example of this principle?”
- “Which of these methods do you think are most important?”
- “Does anyone disagree with that conclusion?”

**Make sure you understand the questions:**
- If you are unsure of a question’s meaning, ask the listener to repeat it.
- If you are still unsure, use phrases like, “Do you mean…?”, “I’m not sure I understand the question, but I think you are asking…”.

**Options for handling questions that are outside the scope of the workshop:**
- Be prepared to table questions that might divert the training. You might respond with phrases like, “That is beyond the scope of this workshop, but I’d be happy to discuss it afterward.”
- A flip chart paper where you ‘parking lot’ off-topic questions to address at the end of the workshop.
- Staying an extra 30 minutes to speak with individual participants.
- Providing your contact information for follow-up questions.
- Suggest another source of information for topics that you do not wish to discuss or feel unqualified to discuss.

**D. The Value of Listening**

...Technical skills and self-mastery alone allow you to be an outstanding individual contributor. But to lead you need an additional interpersonal skill set: you’ve got to listen, communicate, persuade, and collaborate.

Daniel Goleman,
*Emotional Intelligence*

As a trainer you clearly lead the workshop, but you also engage with participants. Consider the day-long workshop as a two-way conversation, not simply a lecture. Establishing a rapport with each participant from the beginning develops trust and motivates participants to become more committed to seed saving and sharing their skills with others. One way to do this is in the first session of the day during the introductions. Give the participant your attention and nod or smile to indicate that you are listening. Trainers direct workshop participants in activities, facilitate discussions, and respond to participants’ questions; these are all opportunities to practice leadership. The ability to plan ahead and encourage others to participate and engage in the plan requires leadership skills. Everyone can benefit from developing a level of confidence and competency in leading others. Listening is one of the first steps to leadership.

Listening enables us to obtain information, determine issues, make decisions, and resolve conflicts. As a trainer you will listen to participants: seeking more information, sharing techniques that they have developed, or expressing doubts or opinions about your statements. Often when we listen our attention is focused on analyzing and judging rather than listening compassionately for the underlying needs the speaker is expressing. Listening skills include recognizing one’s own emotional responses in a conversation. Good listeners can continue to listen carefully even when they disagree because connecting with the individual is the priority. Responding openly to participants’ questions can lead to a greater degree of communication.

Another form of listening is through observing people’s responses to the lecture part of the workshop. As you present new information, look for signs of comprehension. Are any participants nodding in agreement or smiling? Be aware of signs of fatigue or inability to concentrate. Notice if someone who previously made eye contact is now flipping through materials or looking around the room. Are people texting? Overloaded messages cause participants to reach a saturation point and stops learning. Be attentive to the participants and gear your training accordingly.
E. Integrating Participant Activities 
Into the Workshop

Section II includes activities that have been paired with the lessons. Activities help us think and process what has just been shown. Games not only lighten the mood and allow people to get up and move; games engage our senses. The activities are suggested for gardeners, beginning-level seed savers and intermediate-level seed savers. Trainers leading the activities will be asked to comment on how useful these categories are in grouping participants. Knowing how long an activity could take helps trainers to better manage the schedule, so please consider keeping a record. Note the following: time an activity takes, number of participants, and practical tips and suggestions for improving the flow of an activity for future trainers’ benefit.

Suggestion for leading activities:
Workshops with twenty to thirty people form groups of no more than three to five. This size encourages each person to participate.

• Break into groups: First activity form groups by counting off one, two, three, four.
• All ones in same group; all twos in the next.
• Second activity people can work with those sitting near them.
• When you assign the exercise or activity someone should record the group’s conclusions and one person should be designated spokesperson.
• Walk around and eavesdrop on the groups to make sure they are on the right track. Give pointers if a group seems to be going astray based on the activity objective.
• After a certain number of minutes, announce, “sixty seconds left...” so they can finish up.
• Ask each group spokesperson for a two-minute conclusion. Remind participants of the full schedule and the need for brevity.

After leading several workshops and using a specific activity consider improvising and keeping notes of the result. Exercises that provide an element of surprise are the ones that participants learn the most from. If participants engage in an activity that seems like it should work, but then has an unexpected outcome, the event is long remembered. If you are unsure of tampering with the activity, consult a presenter for advice.

F. Reflective Journal Writing

Reflective journal writing is a powerful tool frequently used in educational and training programs. It is used as part of experiential learning that includes:

- Concrete experience
- Reflective observation
- Active experimentation

By reflecting on a question at the end of each module and writing in the journal provided, participants can reinforce the general principles presented here. Some participants find this a rewarding way to learn. The writing can be a way of making sense out of complex concepts. At first the new material is just information. By reflecting on it, rewording it, linking it to something we already know and then applying it to something new, we begin to make the information our own. It is one step toward embodying the new material and developing a sense of confidence. The trainer can choose to include one or more of the writing activities, or suggest participants do them at home.

G. Know Your Audience: 
Skill and Competency Levels

The seed saving workshop has so much information we want to use everyone’s time most effectively. By creating groups of participants with the same skill level presenters and trainers can gear the instructional content and activities to the participants needs. The PP is packed with information, some of it over the heads of newbies. For these participants, more time spent on activities is recommended.

Just as the seed is the culmination of a plant’s life, so too, seed saving can be considered the apex of a gardener’s knowledge and practice. A gardener’s maturation can be compared with that of a plant’s: a seed germinates, grows into a crop, and flowers. Later it produces ripe seed. The early education of a gardener starts with digging in the earth, planting seeds and developing an intuitive awareness of ecosystems and the practice of ecological gardening. After several seasons of raising a garden, building the soil, contending with pests, harvesting crops, the gardener develops a sense of the cycles and is ready to move on to becoming a seed saver. The garden-
er commits to planning and producing seed for the next season, reserving enough space for a population of non-edible seed crop.

The workshop registration form will be designed by each organization. Consider including this section to help determine what skill and interest level participants have.

A Level. I value local food, food sovereignty and am a relative newbie to gardening (three to four years) experience. Want to save seeds and learn more about them. Have saved flower and herb seeds. Have saved seeds of vegetables that inadvertently went to seed. **Trainer: Go to AA below**

B Level. All of the above and/or Have already been saving lettuce, beans, or tomatoes for a year or two. Have read *Seeds of Diversity Handbook* or *Seed To Seed* by Suzanne Ashworth. Still a little confused about open-pollinated and why hybrids are so difficult to breed. Want to understand more about isolation distances. Would like to save seeds from biennials. **Trainer: Go to BB below**

C Level. All of the above and/or I have already saved seeds and recognize that planning is the first step. I am still learning about population size and isolation distance. I want to explore concepts of preserving genetic integrity (keeping the lines pure, or maintaining pedigree) and the value of landraces (allowing for more variation). I have been saving heirlooms and am committed to preservation seed saving. **Trainer: Go to CC below**

AA Goals for New Gardeners
New gardeners can learn about seed saving to have a deeper appreciation for what seed growers provide. The benefit of taking a seed saving workshop for the average gardener:

- Understand the need for open-pollinated seed saving. Make the commitment to buy open-pollinated seeds.
- Recognize and appreciate the valuable contribution of small-scale seed companies.
- Develop the literacy to ask informed questions at seed swaps.

**Points to emphasize**
Sure bets for beginning seed savers— Self-pollinating vegetables that are annuals complete their cycle the first season, for example—beans, lettuce, and peas. Gardeners eager to start will be encouraged to work with self-pollinating crops like beans, tomatoes and lettuce.

BB Seed Savers
It is more important for participants to thoroughly learn a few new concepts and come away with a few practical tips than to be flooded with too much content. The curriculum is full. This is why we suggest screening the participants’ applications and group them with others of similar skill level. It will be possible to participate in this seed saving workshop several times and learn more.

**Points to emphasize**
When you have more confidence and are willing to experiment, explore these variables: cross-pollinating varieties and biennials.

CC Potential Trainer/Soon to be Presenter

**Points to emphasize**
Suggested background for potential trainers:
- Hands-on education with mentors or other seed experts
- Several years experience with seed-saving techniques
- Basic understanding of fundamental concepts
- Ability to simplify complex ideas
- Ability to provide in-depth information when solicited by students

The application form could include the following note: We will notify you when there are ten to twenty people available at the same skill and interest level.

H. Logistics for Presenters

**Pre-workshop Planning**

**Organizing and managing a training course:**

- Invite potential trainers for training workshop.
- Publicize Seed Saving Workshops.
- Create application form with questions to identify participant skill level. (See section on know your audience.)
- Locate facility for event, consider room layout.
• Select and notify participants or trainers of the dates, time, and place.
• Print Participant folder or Trainer folder, OSA's Seed Saving Guide for Gardeners and Farmers.
• Decide if lunch, snacks and beverages will be included. (When participants eat in the afternoon workshop starts on-time.)
• Arrange training equipment: see Garden Cart Checklist in appendix.
• Arrange training room: seating arrangements, position of easel, screen, et cetera.

**Checklist for organizing training:**

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**Last-Minute Reminders for Trainers:**

• Maintain good eye contact, speak clearly and make sure everyone can hear you.
• Move around the room and gesture.
• Locate visual props where everyone can see it.
• Write boldly and clearly on the flip chart.
• Bridge one topic to the next.
• Encourage questions and keep the group focused on the task.
• Recap at the end of each module. Summarize complicated concepts with simple explanations, offering more info in the seed saving manual.
• Remind participants that this is an overview, think of it as instructions for using a driver's manual.
• Remember to use good time management.
• Check to see if your instructions are understood. Be aware of the participant’s body language.

**PART II: SEED SAVING WORKSHOP**

**Using and Adapting the Seed-saving Workshop Curriculum**

**Lesson Plans:** The six modules have been converted into lesson plans that can be utilized by the presenters if they have access to a garden or farm site and wish to present their teaching in the field. These plans will provide you with a list of key concepts, materials needed, and suggested activities to support the instructional goals.

**Participant Folders:** In the appendix you will find a list of materials followed by six files or master copies that can be copied or printed from a PDF. Select which ones to include to with the day’s curriculum and provide one copy for each participant. The OSA A Seed Saving Guide for Gardeners and Farmers is the reference source recommended for the workshop. Presenters comfortable with a different reference can alternately provide that to trainers and participants. Participant folders include a copy of a seed saving guide, copies of the lesson plans for each module, copies of the major vegetable family albums, a glossary of terms, a resource list, the instructions for games and activities, the workshop agenda and schedule, and workshop evaluation form. Determine which of these files will best support your workshop based on all the variables. Please review this folder before teaching and use the masters to create a folder for each participant.

**Using and Adapting the PowerPoint Presentation**

The PowerPoint is divided into six modules. Each module introduces key concepts, follows that with a guided practice activity to reinforce skills, and ends with a reflective journal exercise to apply concepts and skills to the resources of each participant.

**Presenter’s View of the PowerPoint provides:**

- A visual of the slide being presented
- Additional information resources to assist the teaching and learning
- The next slide in sequence
- Timer
- A section for the trainer to add notes.
Your Presentation
The PowerPoint slide presentation is the backbone of an indoor seed saving workshop, but there is not a script out-of-the-box. Preparing your own presentation will require some time and practice. It will be yours and participants will value the authenticity. Each module comes with a lesson plan. Read each one thoroughly before your presentation. Determine how knowledgeable and comfortable you are with each module. If you are a long time seed saver chances are you have a good understanding of most of the topics.

The PowerPoint provides the essential data. Learn to utilize the presenter’s view and you will have a strong foundation for a clear and coherent presentation. A professional can look at one slide in this PP and speak for 10 minutes. The important thing is to study this material and develop a level of ease. Giving a presentation that will keep participant’s interest alive depends on several factors. The PowerPoint is a great aid providing the basics. The presenter and activities will engage people.
Lesson 1: Why I Save Seed

Lesson 1, slide 1-9

Overview
- Introduction to workshop, trainer agenda, and teaching pedagogy shared
- Introduce Bauta Initiative
- One-minute participant introduction
- Logistics, schedule

Objectives
- To review the goals and objectives of the training
- To acknowledge the personal, biological and ecological reasons for saving seed

Instruction
- Review the goals of the training and the fundamental ideas that support it. Review the agenda, primer, modules, journal and folder. Explain the approach that will be utilized in the training. Review activity format.

Activities
- Discuss fundamental ideas of slide four.
- Introduction using five questions: Name, occupation, Foodshed, history/experience with seed saving, goals of the workshop.
- Review the goals of the training and the fundamental ideas that support it. Discuss the four questions that at the core of the training: 1. Why am I saving seed? 2. What seed is best for me? 3. What biological principles are basic to seed saving? 4. What are the skills and techniques need to grow and save seed?
- Review the agenda, modules, journal and folder. Explain the pedagogy or teaching approach that will be utilized in the training.
- Brainstorm a list of responses to the question “Why save seed?”

Journal Reflection
- Construct two scenarios: If current trends in the seed industry continue, describe seed sources and seed quality in five years. What might be different if you save seed and/or train others to save seed?
Activity: Reflective Journal Writing

Indoor/outdoor  Level A, B, C  Fall, Winter, Spring, Summer

Description
• At the end of a module, participants reflect on pertinent questions as they write in their journal

Objective
• To explore new concepts presented in a module

Trainer Background
• Reflective journal writing is a powerful tool to process and reinforce new concepts through reflection and linking to previous knowledge and experience. Trainers select from the following lessons based on an understanding of the group’s needs.

Action
• At the end of each module, the trainer suggests certain questions that participants can write about. Participants can choose to write about a different topic that is more relevant to them

Lesson 1
Construct two scenarios: If current trends in the seed industry continue, describe seed sources and seed quality in five years. What might be different if you save seed and/or train others to save seed?

Lesson 2
If you already save seed, are you drawn to saving heirlooms? Can you imagine making the commitment to a rare vegetable variety and growing it out every couple of years to ensure that the genetic integrity won’t be lost? Imagine several decades into the future. You are passing this seed to a young gardener. What would you tell her or him?

Lesson 3
Select any vegetable crop that you might consider growing to seed. You have planted 100 seeds and are observing them as they grow. Describe the traits that you would like to see and would choose to save. If you are going to “save the best and eat the rest”, describe the ones you will eat and the ones you will save for seed.

Imagine you are a bee, what flowers would you be drawn to? Think of your farm or garden; what challenges and advantages does it have in regards to isolation distances?...continued on page 16
Lesson 4
Did you already know about plant families? If so, was there a significant experience that reinforced the concept? What is your favorite family and why?

If the idea of grouping plants together based on common characteristics is new to you, are there ways this will influence your gardening? Consider focusing on learning about one family at a time. Can you think of other characteristics that plant families might share? Perhaps culinary and medicinal qualities, attracting pollinators, cultivation requirements...

Are you familiar with any native plants in the crop families?

Lesson 5
Landrace is a term for a population of a species maintained by traditional farmers. In plant breeding, the term refers to a large number of different genetic characteristics that are well adapted to its habitat. Some seed savers refer to landraces as commonly to them as “Adaptivars”. These plants have variable characteristics and are allowed to continually cross within the population.

Germination Testing: Seeds with low vigor may not be able to withstand the environmental challenges of field conditions, including exposure to uneven soil moisture, soil surface crusted over, attack by disease organisms, or being planted too deeply. Have you ever observed two batches of the same variety responding differently in the garden? Have you ever suspected low viability?

Lesson 6
Now that you have completed the workshop would you answer any of the four questions differently?

Why am I saving seed?
What seed do you view as best?
Which concepts reviewed today will support me as I begin and/or expand my seed saving skills?
What are the skills and techniques will I be using to save seed?
Lesson 2: What Seed Is Best For Me?

Lesson 2, slide 10-12

Overview
• Introduction/discussion of the options for seed choices: open-pollinated, hybrid, GMO, heirloom, annual, biennial, and perennial

Objective
• Clarify the difference between hybrids and open-pollinated. Lead participants to an understanding of why open pollinated seed is the best choice for seed saving
• Discuss GMO as it is relevant to the seed growers in your area

Activities
• Discuss the implication of choosing OP vs. hybrid
• Discuss the implications of choosing annual crops vs. hybrid crops
Activity: Glossary Game

Indoor/outdoor: Level A, B, C
Fall, Winter, Spring, Summer

**Description**
- Participants give a creative fabricated definition of a seed term

**Objective**
- Create enjoyable ways to strengthen participants' seed-saving vocabulary

**Trainer Background**
- Participants select a down-turned card with a glossary term. A few minutes later they are asked to provide a creative interpretation of the word. Other participants try to guess. They may dance, recite a poem, use a simile, as long as they don't use the term.

**Preparation**
- Copy template and cut up cards

**Action**
- Ask participants to select a card
- Participants find the definition from the glossary in their handout
- Take a few minutes to compose a creative definition
- Each person performs the term written on their card (large workshops divide into groups of 5 participants)
- Participants can choose a different term or pantomime clues as in charades.

**Reflective Journal**
- Write about any of the performances that were particularly memorable

**Materials**
Cards with glossary terms are on a template form located in appendix.
Activity:
Seed Buyer’s Guide

Indoor Level A Fall, Winter, Spring, Summer

Description
• Participants will choose seeds for their garden based on several variables

Objective
• To recognize the value of purchasing local seeds and to discover local seed companies
• To recognize different seed choices including best adapted vegetable varieties, type of seed (OP, hybrid), and seed be able to define seed terms including, organic, treated (F1) hybrid

Trainer Background
• Small, regional seed companies have sprouted throughout North America. Supporting these companies’ benefits the consumer and support regional food security.

Preparation
• Invite participants to call out seed choices and trainer write them on board

Action

<table>
<thead>
<tr>
<th>Best Choices</th>
<th>Good Alternatives</th>
<th>Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your own saved seeds</td>
<td>Regionally grown</td>
<td>Industrial (F1) hybrid</td>
</tr>
<tr>
<td>Locally grown seeds</td>
<td>Open-pollinated</td>
<td>Treated seeds</td>
</tr>
<tr>
<td>Open-pollinated</td>
<td>Non-hybrid</td>
<td>GMO</td>
</tr>
<tr>
<td>Non-hybrid</td>
<td>Heirloom</td>
<td>Chain store seed racks</td>
</tr>
<tr>
<td>Heirloom</td>
<td>Organic</td>
<td>Corporate seed companies</td>
</tr>
<tr>
<td>Organic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certified naturally grown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

...continued on page 20
Activity: Seed Buyer’s Guide (cont.)

Discussion or Reflective Journal

• Seeds from catalogs may be kept fresher than seed from garden centers and retail stores where temperature and humidity levels often fluctuate.
• Regional seed was grown under the same climatic conditions and pest and disease constraints that your garden is exposed to. Seeds from large seed companies may have been outsourced to other continents.
• Purchasing organic seeds is important, but also consider the need to maintain diversity. Many rare heirloom seeds are not yet available as organic seed. Choose some and grow them organically. Then understand the requirements for maintaining genetic purity, such as isolation distance and population size. Save the seed and share them.

Materials

Local and national seed company catalogs
List of vegetables that do well in your area
Cards with definitions:
  - Heirloom
  - Hybrid
  - Open-pollinated
  - Organic, Treated
  - GMO

Other Resources

Gardens of Destiny with Dan Jason. A Feature Documentary by Jocelyn Demers.

The Gift, a film about Dan Jason by Jean-Marc Abela.

Lesson 3A: Floral Anatomy

Overview
- Review of the reproductive parts of angiosperms. Techniques and core concepts that support reproductive success and maintain crop genetics are covered.

Objectives
- Recognize floral anatomy as a foundation for understanding pollination and fertilization.

Instruction
- Using a drawing or diagram of a flower, go over the major structures and their functions.
- Explain pollination and fertilization. Discuss any hurdles the plant must overcome to make these processes complete.
- Explain and give examples of perfect flowers (bisexual), imperfect flowers (unisexual), monoecious and dioecious plants, self pollination, cross pollination, inbreeding plants, outbreeding plants. Discuss the advantages and disadvantages of each.

Activities
- Guide a dissection of a perfect flower to identify male and female parts.

Materials

Glossary

Drawing of flower
Activity: Floral Anatomy

Indoor/outdoor Level A, B, C Fall, Winter, Spring, Summer

Description
• Participants dissect flowers

Objective
• Recognize floral anatomy as a foundation for understanding pollination and fertilization. Recognize perfect and imperfect flowers, basis for learning concepts of outbreeding and inbreeding.

Trainer Background
• This activity is a tangible way to learn important vocabulary words that form the underlying foundation of seed saving.

Preparation
• Invite participants to call out seed choices and trainer write them on board.

Action
1. Pass out flowers, razorblade, pin, and magnifying glasses
2. Draw a perfect flower and an imperfect flower. Post on easel and pad
3. Define parts

Materials
Flowers, one per participant (may be purchased from floral section of supermarkets if not available in field. Find large flowers with both male and female parts. Alstromeria is a good choice. In spring look for buttercups in lawns) Pea family flowers include a tiny pod inside, and the anthers are wound up tight—indicator of self-pollination.

Razorblade and pin
Magnifying glasses or loop
Easel
Pad And Marker
Lesson 3B: Mating Systems

Lesson 3, slide 22-29

Overview
- Review the life cycle of angiosperms

Objectives
- Explain and give examples of perfect flowers, imperfect flowers, monoecious and dioecious plants, self pollination, cross pollination, inbreeding plants, outbreeding plants. Discuss the advantages and disadvantages of each.
- Explain the techniques of isolation, population size and roguing and how they are applied to seed saving in particular varieties.
- Reference Crop Specific Guide in OSA manual, page 25-27. Use this as the basis for a discussion on inbreeding depression.

Activities
- “We are seeds” game. See activity folder for directions. Cards in appendix.

Materials

Glossary

We are Seeds Cards

Other Resources

The Xerces Society
www.xerces.org/
International, nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat.
Activity: We Are Seeds Game

Indoor/outdoor Level A, B, C Fall, Winter, Spring, Summer

Description
1. Participants play a game to recognize selection pressures and genetic variability

Objective
• To understand the value of population size for saving seeds

Trainer Background
• Seeds exhibit traits when exposed to environmental conditions

Preparation
• Cards are found in the appendix in the trainer’s section.

Action
1. Each participant is given a card. They are all spinach seeds that have just been planted.
2. Ask participants to stand, to represent germination.
3. Trainer calls out certain weather conditions and pest problems that occur during the spinach plant’s life.

EXAMPLE:
Early spring: cold
Summer conditions: Unusually wet. Soils become water-logged.
Pest problems during the growing season: aphids and downy mildew.

4. If the participant’s card has a trait that matches the conditions, the participant remains standing. If not, the plant dies and the participant sits.
5. Of the remaining people standing, trainer asks who is female.

Discussion
• How could this game be modified? What other selection pressures could be included? Farmer Jane could rogue the plants for leaf size and color. She could rogue for early bolting plants. What if the only remaining plants at season’s end are all female?

Materials
Cards with traits: Male or Female, description of hardiness and resistance to problems.
Lesson 3C: Planning
Strategies for Preserving Your Crops’ Genetics

Lesson 3, slide 30-36 expand for intermediate participants

Overview
- Techniques and core concepts needed to support reproductive success and maintain crop genetics are covered

Objectives
- Creating desired genetic results through population size, isolation distances and techniques of roguing
- Understand reasoning and practices behind the following concepts: isolation, population, roguing

Description
- Explain planning techniques and practices: isolation distances, population size, and roguing to maintain or create certain genetic results

Trainer Background
- Explain that selecting and roguing are two sides of the same coin
# Activity: Save the Heirloom

**Indoor/outdoor** | **Level C** | **Fall, Winter, Spring, Summer**
---|---|---

## Description
- Participants, guided by the trainer, determine the best plan for saving a hypothetical heirloom seed variety.

## Objective
- To develop a planning strategy for preserving a crop's genetic purity and avoid inbreeding depression.

## Trainer Background
- This exercise allows participants to understand the variables that affect a crop's genetic purity and consider the strategies and techniques to maintain an open-pollinated variety. Trainers determine the group's skill level, and either guide participants through the process or allow them to work in groups of 2-3. Genetic "purity" is the trueness of the type, the lack of mixing, or the uniformity of the variety. This relates to isolation distance. Population size impacts the genetic diversity of the crop and a large population will help avoid inbreeding depression.

## Preparation
- Select and prepare a written description of an heirloom plant.
- Create a hypothetical site and its environmental conditions: describe any physical barriers or extreme weather, including those that will affect crop's vernalization requirements (steckling, or overwinter in ground).

## Action
- Participants are asked to describe their course of action, when given 300 hypothetical heirloom carrot seeds (or any other crop that the trainer chooses) with the instruction to keep the lines pure.

...continued on page 27

## Materials
- Isolation charts page 25 in OSA's *A Seed Saving Guide for Gardeners and Farmers.*
Activity: Save the Heirloom (cont.)

Indoor/outdoor: Level C
Indoor/outdoor: Level C
Date: Fall, Winter, Spring, Summer

Discussion
- What qualities will you try to select for? What traits?
- How and when will you select (or rogue) plants?
- How many plants do you need to grow to avoid inbreeding depression and conserve adequate genetic diversity of the crop?
- How much isolation distance do you need to maintain to protect the genetic purity of the crop?
- Why so many?
- What challenges for seed crop?
- What special techniques could be more effective?
  - Planting criteria
  - Pollination criteria
  - Distance or Isolation
- What challenges does this crop have when caging?

Materials
Isolation charts page 25 in OSA's A Seed Saving Guide for Gardeners and Farmers.
Lesson 4: Biological Principles: Plant Taxonomy

Lesson 4, slide 37-49

Overview
- Introduction and review of the science of taxonomy and its importance to seed saving
- Discussion of binomial nomenclature and the components in accurate record keeping
- Review of the major vegetable families, their members and common characteristics

Objectives
- To understand and use the scientific names for our seed crop
- Appreciate the science of taxonomy and accurate record keeping
- To recognize that a species name includes both the genus and species
- To note the patterns and similarities among and between the major vegetable plant families and their seeds

Activities
- Lecture: Review taxonomy, the classification hierarchy of a vegetable variety. Explain the significance of the scientific names for seed saving. Explain that the important taxonomic levels are family, genus, and species.
- Ask participants to suggest methods of isolation within a greenhouse where two varieties of the same species are growing.
- Review the major agricultural families. Support this with other family members, if they are available.
- Play Crossing Game: Show pictures of plant pairs and ask if they will cross.

Reflective Journal
- Did you already know about plant families? If so, was there a significant experience that reinforced the concept?
- What is your favorite family and why?
- If the idea of grouping plants together based on common characteristics, is new to you, are there ways this will influence your gardening?
- Are you familiar with any native plants in the crop families?

Materials
- Displays of the major vegetable families. If fresh samples are not available, use the “album” photos provided in the PowerPoint.
- Glossary for key terms included in this module.

Other Resources
- The Xerces Society
  www.xerces.org/
  International, nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat.
Activity: Crossing Game

Indoor/outdoor Level B, C Fall, Winter, Spring, Summer

Description
- Participants look at slides or photos of crops and determine which ones can cross. Actual crops can also be used if seasonally available

Objective
- To recognize which crops are at risk of cross-pollination
- To recognize how closely related some crops are—many share the same species name

Trainer Background
- This game reinforces the value of plant classification and knowing the botanical names of crops. It also gets participants thinking about managing isolation distances.

Action
- Instructor presents two crops and asks if they can cross. (Don't give botanical name until participants stop guessing.)

  1A Swiss chard, Beta vulgaris
  1B Lacinato kale, Brassica oleraceae

  2A Kabocha squash, Cucurbit maxima
  2B Watermelon Citrullus lanatus

  3A Beets, Beta vulgaris
  3B Swiss chard, Beta vulgaris

  4A Amaranth, Amaranthus spp.
  4B Beets, Beta vulgaris

  5A Broccoli, Brassica oleraceae
  5B Scotch kale, Brassica oleraceae

Materials
- Photos of vegetables, or in-season crops
Lesson 5: Skills and Techniques for Seed Saving

Lesson 5, slide 50-75 **Harvesting and Cleaning Techniques**

**Overview**
- Review and guided practice of: seed harvesting techniques, dry and wet harvesting methods, proper storage of seeds and germination tests
- Structure and function of the seed as it relates to saving seed

**Objectives**
- To understand the difference between dry seeded and wet seeded plants
- To practice harvesting and cleaning methods
- Reinforcement of skills needed for proper seed saving
- Increase comfort of participants in expanding their seed saving skills with new varieties

Lesson 5, slide 76-79 **Storing Seeds**

**Overview**
- Seeds stored properly last longer

**Objectives**
- Review reasons and techniques for storing seed properly

**Reflective Journal**
- Seeds with low vigor may not be able to withstand environmental challenges of field conditions including exposure to uneven soil moisture, soil surface crusted over, attack by disease organisms, or being planted too deeply. Have you ever observed two batches of the same variety responding differently in the garden? Have you ever suspected low viability? What steps could be taken to increase germination of rare seeds?

**Materials**
- OSA’s A Seed Saving Guide for Gardeners and Farmers.
- Clean and unclean seed, box fan, bowl, thresher, screens, storage containers, labels, jars, envelopes
- Germination test in progress
- Soaked beans

**Other Resources**
- *Seed to Seed: Seed Saving and Growing Techniques for Vegetable Gardeners* by Suzanne Ashworth and Kent Whealy is an excellent reference the “shelf life” and viability of properly stored seeds.

Fermentation removes the germination-inhibiting gel coat. In nature this ensures that seeds don’t germinate in the rotting fruit. Often birds are attracted to berries and act as dispersal agents for transporting seeds. Now humans perform this for tomatoes.
## Activity:
### Seed Cleaning

**Indoor, Outdoor** Level A, B **Fall, Winter**

### Description
- Trainer demonstrates and participants practice seed cleaning techniques

### Objectives
- To demonstrate and practice dry-seed and wet-seed techniques

### Trainer Background
- Depending on the time of year, this activity could last an hour or more. Ideally the trainer would set up several stations during the break. Then the trainer demonstrates several techniques each of threshing and winnowing.
- The details depend on the type and quantity of available dried plant material. Tomatoes could be store bought to demonstrate technique. Experienced seed savers will know the techniques. Trainees could help with set-up and demonstration.

### Preparation
- Start fermenting wet-seeded fruit 2 days before. Make checklist list of tools and materials available. Pack everything the night before. Set up stations during break. Ask for volunteers.

### Action
- Available material to clean will depend on the time of year. It is possible to demonstrate wet seed method from store bought fruits.
  1. Set up several stations
  2. Trainer demonstrates
  3. Participants form small groups and practice at one of four stations for fifteen minutes and then rotate

### Materials
- Tarp or old sheets
- Two buckets or totes
- Box fan
- Large bowl
- Pruners
- Window screen
- Seed screens or hardware cloth
- Small container for wet fruit fermentation
- Storage container for finished seeds
- Indelible marker and masking tape for labeling
Activity:
Peel the Bean

| Indoor | Level A, B | Fall, Winter, Spring, Summer |

**Description**
- Participants examine a soaked bean

**Objectives**
- To identify seed parts; to demonstrate that seeds are alive; and to understand what conditions encourage seed growth while the opposite conditions encourage healthy dormant seeds

**Trainer Background**
- This activity demonstrates germination and the conditions for seed longevity

**Preparation**
- Soak beans in water the day before activity

**Action**
1. Pass out a bean to each participant, and have everyone follow as you dissect the bean
2. Remove the outer layer or seed coat
3. Split the bean lengthwise with fingernail or razor
4. Identify the seed coat; the root, shoot and leaves (together they form the embryo); and food (endosperm)

**Materials**
- Dry bean seeds
Activity: Germination Testing

Indoor Level A, B Winter, Spring

Description
• Participants place one hundred seeds in a moist environment to the number sprouting

Objectives
• To determine seed lot viability by evaluating the germination percentage

Trainer Background
• Seeds deteriorate over time. Germination testing can be used as a tool in several ways. For cultivating edible crops, the test indicates how densely to sow seeds, either in the ground or in a flat for transplanting.
• Advanced seed savers grow seed for preservation purposes, that is, to keep an heirloom or rare variety viable. Since seeds are alive they cannot just be stored indefinitely. Testing seed germination rates is an indicator for when to grow out these seeds.
• It is recommended that when only sixty to eighty-five out of one hundred seeds germinate, the preservation seed saver grows the variety to keep it healthy.

Preparation
• Start a germination test one week prior to the workshop and bring it for demonstration purposes. This will show participants what the outcome of germination testing can be.

Action
1. Each group of four participants counts out one hundred seeds to be tested
2. Make sure to label the seeds being tested with their name, date, and number of seeds
3. Dampen the paper towel or cloth
4. Evenly space the seed in a grid for easy counting
5. Roll the seeds up in damp paper towel or t-shirt, or place in plastic dish if using blotter paper method
6. Place in protected location and keep temperature close to twenty degrees Celsius or seventy degrees Fahrenheit
7. After seven days (number of days depends of type of seeds being tested), open box or bag and count sprouted seeds. That number equals the germination rate.

Materials
Spray bottle and water
Blotter paper, unbleached paper towels, or old t-shirts
Plastic boxes or quart-size Ziploc bags
Lesson 6: Review

Lesson 6, slide 80-81

Overview
- Return to the four initial questions asked of each participant and use these to monitor and adjust for any needed instruction or clarification

Objectives
- Check for an understanding of concepts and skills

Activities
1. Place questions on the screen or board
2. Ask participants to review the questions individually with the option of recording answers in their journal
3. Share and discuss
4. Ask the question, “How will this workshop change how your farm or garden?”.
5. Ask if their goals for the training have been met
6. Reinforce the use of the materials and resources in the folders
7. Evaluate the instruction
APPENDIX

1. Participant Folder List

We recommend providing each participant with a folder including the following:

1. Schedule/agenda of the day
2. Seed Saving Glossary
3. Lesson Plan Handouts (6)
4. Nine major vegetable family albums
5. Digging deeper resource list
6. Workshop Evaluation form
7. Invitation to stay involved form
8. Copy of *A Seed Saving Guide for Gardeners and Farmers* by OSA
9. Journal provided by trainer on site

For a free download of the OSA *A Seed Saving Guide for Gardeners and Farmers*, visit https://www.seedalliance.org/Publications/publication-download-forms/download-form-1/

For another seed saving handbook available as a free download, visit The Seed Ambassadors Project site at http://seedambassadors.org/category/seed-saving-guide/

The American Community Gardening Association has a free slide show, *How To: Seed Saving* available at http://www.slideshare.net/px8.

The Training of Trainers program offers a wide array of materials to adapt to a specific seed saving workshop. Find out who the participants are by reviewing the application forms before the workshop. Determine the participant’s general skill level and gear the workshop accordingly. Determine the following variables and select accordingly: indoors or farm and garden setting, and season. If you are uncertain about topics review the OSA *A Seed Saving Guide for Gardeners and Farmers*. The logistics section in the primer provides additional information.

- The garden cart inventory list is a useful tool for organizing materials to bring to the event.
- The lesson plans form the backbone of the curriculum.
1A. Seed Saving Workshop
Agenda Schedule

Introductions and Overview
8:00 a.m. – 8:45 a.m.
INSTRUCTION: Slide 1-6
Overview of day, logistics

Module 1 Why Save Seed
8:45 a.m. – 9:00 a.m.
INSTRUCTION: Slide 7-9

Module 2 Choosing the Right Seed
9:00 a.m. – 9:30 a.m.
INSTRUCTION: Slide 10-12
ACTIVITY
Beginner: Seed Buying Guide
Beginner: DVD on GMO
Intermediate: Legacy of an Heirloom

Coffee Break

Module 3 Floral Anatomy
10:45 a.m. – 11:45 a.m.
INSTRUCTION: Slide 13-17
ACTIVITY: Floral Anatomy

Module 3 Crop Mating
11:35 a.m. – 12:30 p.m.
INSTRUCTION: Slide 18-29
Perfect and Imperfect
Inbreeding and Outbreeding
ACTIVITY: We are Seeds

Lunch 12:30 p.m. – 1:15 p.m.

Module 3 Isolation, Population Size
1:15 p.m. – 1:45 p.m.
INSTRUCTION: Slide 30 – 36
ACTIVITY: Intermediate level Save the Heirloom

Module 4 Taxonomy and Plant Families
2:15 p.m. – 2:45 p.m.
INSTRUCTION: Slide 37– 49
ACTIVITY: Crossing Game

Module 5 Harvesting and Drying
2:45 p.m. – 3:00 p.m.
Harvesting Wet and Dry Crops
INSTRUCTION: Slide 50-53

Break (Trainer sets up seed cleaning stations for participants rotation)

Module 5
3:00 p.m. - 3:30 p.m.
INSTRUCTION:
Slide 54-59 Biennials
Slide 60-61 Timing of Harvest
Slide 65-68 Wet-seeded crops

Module 5C Cleaning Techniques
INSTRUCTION: Slide 69-75
ACTIVITY: Cleaning seed

Module 5D Storage and Germination Test
3:15 p.m. – 4:40 p.m.
INSTRUCTION: Slide 76-78 Seed storage
ACTIVITY:
Beginners: Peel the Bean
Intermediate: Seed Germination Test

Module 6 Review
4:40 p.m. – 5:00 p.m.
INSTRUCTION: Slide 79-80
Recap
Evaluation
1B. Glossary

**Annual:** Plants that are started from seed and produce seeds themselves within one growing season.

**Biennial:** Plants that require two growing seasons to complete a life cycle, usually exhibiting vegetative growth during the first year and producing seed during the second.

**Bolt:** Go to seed

**Chaff:** Anything that is not seed and needs to be separated from the seed in order to produce a pure amount of seed.

**Cultivar:** A variety of a cultivated crop. Short for “cultivated variety.” See Variety.

**Dioecious:** Plant species that produce male and female parts on separate plants.

**Fermentation:** The chemical conversion of carbohydrates into alcohols or acids.

**Fertilization:** Fusion of a sperm from the pollen tube with the egg from an ovary.

**GMO:** A genetically modified organism (GMO) or genetically engineered organism (GEO) is an organism whose genetic material has been altered using genetic engineering techniques. These techniques are generally known as recombinant DNA technology. With this technology, DNA molecules from different sources are combined into one molecule to create a new set of genes. This DNA is then transferred into an organism, giving it modified or novel traits. (Wikipedia)

**Genotype:** The genetic composition of a plant.

**Germination:** The resumption of growth by the embryo and development of a young plant from seed.

**Germplasm:** A collection of plant genetic resources for a species. This serves as a reservoir of traits able to be inherited for breeding or crop improvement.

**Heirloom:** An open pollinated variety of seed that has been passed down from generation to generation, usually a long time family favorite.

**Hybrid:** Seed of the first filial generation after the cross of two true breeding parental types. Hybrid varieties are the result of crossing two stable parental populations of the same species.

**Hybrid vigor:** The increase in vigor of hybrids over their parental inbred types.

**In-Breeding Depression:** Loss of vigor and variation due to the crossing of two genetically similar plants.

**Inbreeding Species:** Species that tend to self-pollinate rather than cross-pollinate. Inbreeders are less subject to inbreeding depression and require less isolation distance to maintain genetic purity. Seed may be saved from fewer plants than outbreeding species.

**Isolation:** Separating one plant (or group of plants) from another to prevent cross-pollinating.

**Isolation Distance:** The distance required to prevent cross-pollination between two plants of the same species.

**Landrace:** A population of species maintained by traditional farmers. In plant breeding the term refers to a large number of different genetic constitutions that are well adapted to the environmental conditions of its habitat.

**Monoculture:** Producing or growing only one crop over a large area.

**Monoecious:** Plant species that produce male and female flowers on the same plant.

**Open Pollinated Variety:** A stable variety that breeds true from seed, grown allowing plants to freely pollinate with others in the population under field conditions.

**Organic:** Produced according to certain production standards. For crops, it means they were grown without the use of conventional pesticides, artificial fertilizers, human waste, or sewage sludge, and that they were processed without ionizing radiation or food additives.
**Outbreeding Species:** Species that tend to cross-pollinate rather than self-pollinate. Outbreeders are subject to inbreeding depression if genetic diversity is not maintained. Seed needs to be saved from a greater number of plants than inbreeding species.

**Perennials:** Any plant that lives more than two years, usually producing flowers and seeds from the same root year after year.

**Peduncle:** The part of the plant that attaches the seed head to the stem.

**Pollination:** The process by which pollen is transferred from an anther to the stigmatic surface of the pistil of a flower.

**Population:** A collection of organisms of a particular species living in a given geographic area.

**Rogue/Roguing:** The removal of an off-type or diseased plant.

**Steckling:** The trimmed root of a biennial crop like carrots, beets, or parsnips that are prepared for replanting using the root-to-seed method.

**True-to-Type:** A plant (or group of plants) that conforms exactly to the known characteristics of that particular variety, the basis or standard for comparison.

**Umbel:** A flat-topped or rounded flower cluster.

**Variety:** Closely related plants with nearly identical characteristics, which form a subdivision of a species.

**Vernalization:** The exposure of a plant to cold temperatures causing it to become capable of flowering.

**Viable:** Capacity for survival or germination.

**Vigour/vigor:** The intensity at which a seed, when planted, will germinate, and a measure of the increase in plant growth or foliage volume through time after planting.
**Amaranthaceae Family**

**Crop Members**
Amaranth, Spinach, Beets, Swiss Chard, Quinoa, Orach

**Flower Description**
Regular symmetry, often without petals

**Life Cycle**
Mostly biennial

**Fruit Type**
Capsule, dry, indehiscent

**Matting System**
Very outbreeding

**Pollinators**
Primarily wind

**Former Name**
Chenopodiaceae

---

**Botanical Names**

<table>
<thead>
<tr>
<th>Genus</th>
<th>Specific Epithet</th>
<th>Common</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amaranthus</td>
<td>spp</td>
<td>amaranth</td>
</tr>
<tr>
<td>Beta</td>
<td>vulgaris</td>
<td>beets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swiss chard</td>
</tr>
<tr>
<td>Spinacia</td>
<td>oleracea</td>
<td>spinach</td>
</tr>
<tr>
<td>Chenopodium</td>
<td>quinoa</td>
<td>quinoa</td>
</tr>
<tr>
<td>Atriplex</td>
<td>hortensis</td>
<td>orach</td>
</tr>
</tbody>
</table>
AMARYLLIDACEAE FAMILY

CROP MEMBERS

Leek, onions, garlic

FLOWER DESCRIPTION

Symmetrical, perfect, umbell

LIFE CYCLE

Biennial

FRUIT TYPE

Capsule

MATING SYSTEM

Primarily outbreeding

POLLENATORS

Sweat bees, leafcutter bees, flies, wasps

Botanical names

<table>
<thead>
<tr>
<th>Genus</th>
<th>Species</th>
<th>Common name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allium</td>
<td>orebro-</td>
<td>leek</td>
</tr>
<tr>
<td>Allium</td>
<td>cepa</td>
<td>onions</td>
</tr>
<tr>
<td>Allium</td>
<td>sativum</td>
<td>garlic</td>
</tr>
</tbody>
</table>
**Apiaceae Family**

**CROP MEMBERS**
Carrots, fennel, parsnips, parsley, celery, cilantro, celeriac, dill

**FLOWER DESCRIPTION**
Regular symmetry, umbell, perfect

**LIFE CYCLE**
Mostly biennial

**FRUIT TYPE**
Dry, indehiscent

**MATING SYSTEM**
From partially to very outbreeding

**POLLINATORS**
Flies, wasps, small sweat bees

**FORMER NAME**
Umbelliferae

<table>
<thead>
<tr>
<th>Genus</th>
<th>Specific Epithet</th>
<th>Common</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daucus</td>
<td>carota</td>
<td>carrot</td>
</tr>
<tr>
<td>Apium</td>
<td>graveolens</td>
<td>celery, celeriac</td>
</tr>
<tr>
<td>Foeniculum</td>
<td>vulgare</td>
<td>fennel</td>
</tr>
<tr>
<td>Pestinaca</td>
<td>sativa</td>
<td>parsnip</td>
</tr>
<tr>
<td>Petroselinum</td>
<td>crispuam</td>
<td>parsley</td>
</tr>
<tr>
<td>Coriandrum</td>
<td>sativum</td>
<td>cilantro</td>
</tr>
<tr>
<td>Anethum</td>
<td>graveolens</td>
<td>dill</td>
</tr>
</tbody>
</table>
**Botanical Names**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Specific Epithet</th>
<th>Genus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lettuce</td>
<td>latuca</td>
<td>Lactuca</td>
</tr>
<tr>
<td>Sunflower</td>
<td>annuus</td>
<td>Helianthus</td>
</tr>
<tr>
<td>Chicory</td>
<td>inquinum</td>
<td>Chichorium</td>
</tr>
<tr>
<td>Endive, Escarole</td>
<td>endiva</td>
<td>Chichorium</td>
</tr>
</tbody>
</table>

**Crop Members**

Endive, escarole, chicory, cardoon, artichoke, sunflower, lettuce

**Family**

**Asteraceae**

**Common Name**

Lettuce, chicory, endive, escarole, artichoke, sunflower, lettuce

**Genus**

Lactuca, Helianthus, Chichorium, endiva, endiva

**Specific Epithet**

latuca, annuus, inquinum, endiva

**Botanical Name**

Lactuca, Helianthus, Chichorium, endiva

**Crop Members**

Endive, escarole, chicory, cardoon, artichoke, sunflower, lettuce

**Flower Description**

Tiny flowers in heads can be either symmetrical or asymmetrical. Tiny flowers in heads can be either symmetrical or asymmetrical.

**Life Cycle**

Varied

**Fruit Type**

Achene, dry, indehiscent with a pappus (fuzzy parachute)

**Mating System**

Variable within the family

**Pollinators**

Many self fertile
**Brassicaceae Family**

**CROP MEMBERS**
Cabbage, kale, mustard, rutabaga, broccoli, cauliflower, collards, kohlrabi, turnip, radish, rocket

**FLOWER DESCRIPTION**
Symmetrical, perfect, four petals that form a cross

**LIFE CYCLE**
Mostly biennial

**FRUIT TYPE**
Silique (dry splitting)

**MATING SYSTEM**
Very outbreeding

**POLLINATORS**
Insects

**FORMER NAME**
Cruciferae

### Botanical Names

<table>
<thead>
<tr>
<th>Genus</th>
<th>Specific Epithet</th>
<th>Common</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brassica</td>
<td>oleracea</td>
<td>broccoli, brussel sprouts, cabbage, cauliflower, klae, collards, kohlrabi</td>
</tr>
<tr>
<td>Brassica</td>
<td>rapa</td>
<td>broccoli raab, chinese and napa cabbage, turnips</td>
</tr>
<tr>
<td>Brassica</td>
<td>juncea</td>
<td>mustard greens</td>
</tr>
<tr>
<td>Brassica</td>
<td>napus</td>
<td>rutabaga, rape, siberian kale</td>
</tr>
<tr>
<td>Raphanus</td>
<td>sativus</td>
<td>radish</td>
</tr>
<tr>
<td>Eruca</td>
<td>sativa</td>
<td>rocket</td>
</tr>
</tbody>
</table>
Cucurbitaceae Family

Crop Members

Summer squash, Winter squash, butternut squash, delicata squash, crookneck squash, spaghetti squash, acorn squash, banana, butternut, pattypan, hubbard, buttercup, turban, squash bees, honey bees, bumble bees

Family

Cucurbitaceae

Genus

Cucurbita

Species

Cucurbita maxima, Cucurbita moschata, Cucurbita pepo

Common Name

Banana squash, butternut squash, hubbard squash

Mating System

Primarily outbreeding

Pollinators

Squash bees, honey bees, bumble bees

Flower Description

Symmetrical, imperfect, moneocious, ovary below female flower

Fruit Type

Annual

Life Cycle

Fleshy with hard rind

Crop Members

Summer squash, Winter squash
**FABACEAE FAMILY**

**CROP MEMBERS**
- Soybean, lentils, runner beans, lima bean, common bean, garden peas, fava, peanuts, and more.

**FLOWER DESCRIPTION**
- Asymmetrical, classic pea shape banner and keel.

**LIFE CYCLE**
- Annuals

**FRUIT TYPE**
- Legume, dry splitting on two seams

**MATING SYSTEM**
- Various inbreeding

**POLLINATORS**
- Mostly self-pollination, occasionally bumble bees

### Botanical names

<table>
<thead>
<tr>
<th>Genus</th>
<th>Species</th>
<th>Common name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phaseolus</td>
<td>coccineus</td>
<td>runner beans</td>
</tr>
<tr>
<td>Phaseolus</td>
<td>vulgareus</td>
<td>common beans</td>
</tr>
<tr>
<td>Pisium</td>
<td>sativum</td>
<td>garden pea, edible pod pea</td>
</tr>
<tr>
<td>Vicia</td>
<td>faba</td>
<td>fava bean, broad bean</td>
</tr>
<tr>
<td>Arachis</td>
<td>hypogea</td>
<td>peanut</td>
</tr>
<tr>
<td>Glycine</td>
<td>max</td>
<td>soybean</td>
</tr>
<tr>
<td>Lens</td>
<td>culinars</td>
<td>lentil</td>
</tr>
<tr>
<td>Glycine</td>
<td>max</td>
<td>soybean</td>
</tr>
<tr>
<td>Lens</td>
<td>culinars</td>
<td>lentil</td>
</tr>
</tbody>
</table>

**Botanical names**
- **Genus**: Phaseolus, Pisium, Vicia, Arachis, Glycine, Lens
- **Species**: coccineus, vulgareus, sativum, faba, hypogea, max, culinars
- **Common names**: runner beans, common beans, garden pea, edible pod pea, fava bean, broad bean, peanut, soybean, lentil
### Poaceae Family

<table>
<thead>
<tr>
<th>Crop Members</th>
<th>Botanical Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat, corn, oats, barley, rye, teff</td>
<td>Eragrostis, Hordeum, Triticum, Zea, Avena, Panicum, Secale</td>
</tr>
</tbody>
</table>

**Crop Members**
- Wheat, corn, oats, barley, rye, teff

**Botanical Names**
- Eragrostis<br>- Hordeum<br>- Triticum<br>- Zea<br>- Avena<br>- Panicum<br>- Secale

**Poaceae Family**

- **Genus**
  - Eragrostis
  - Hordeum
  - Triticum
  - Zea
  - Avena
  - Panicum
  - Secale

- **Species**
  - Common name: 
    - Eragrostis<br>- Hordeum<br>- Triticum<br>- Zea<br>- Avena<br>- Panicum<br>- Secale

- **Pollinators**
  - Wind

- **Mating System**
  - Very outbreeding

- **Fruit Type**
  - Grain

- **Life Cycle**
  - Annual

- **Flower Description**
  - Spikelet flower

**SeedAlliance.org**

Training of Trainer’s Seed Saving Primer
**Solanaceae Family**

**Crop Members**
Tomato, tomatillo, Sweet pepper, Eggplant, potato

**Flower Description**
Symmetrical, five united petals, 5 stamens, anthers split lengthwise

**Life Cycle**
Annual

**Fruit Type**
Berry

**Mating System**
Varies among species

**Pollinators**
Buzz pollination by bumble bees for some species

---

**Botanical Names**

<table>
<thead>
<tr>
<th>Genus</th>
<th>Species</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capsicum</td>
<td>annuum</td>
<td>sweet pepper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>chili pepper</td>
</tr>
<tr>
<td>Physalis</td>
<td>ixocarpa</td>
<td>tomatillo</td>
</tr>
<tr>
<td>Solanum</td>
<td>lycopersicum</td>
<td>tomato</td>
</tr>
<tr>
<td>Solanum</td>
<td>melongena</td>
<td>eggplant</td>
</tr>
<tr>
<td>Solanum</td>
<td>tuberosum</td>
<td>potato</td>
</tr>
</tbody>
</table>
1D. Other Resources

Seed Saving Organizations

Seeds of Diversity: People Protecting the People’s Seed
http://www.seeds.ca/
Canada’s heritage seed program

Seed and Plant Sanctuary for Canada
http://www.seedsanctuary.com
Charitable organization dedicated to preservation and promotion of heritage seeds

Seed Banks, Seed Libraries, & Seed Swaps

Seed Library Public Library of Richmond, California, USA
http://www.richmondgrowsseeds.org/index.html

“How to Organize a Community Seed Bank”
www.seedmatters.org

“How Swaps”
www.seedmatters.org

Seed Saving Webinars


GMO

“How GMO News”
Sanctuary Seeds owner, Dan Jason speaks out against GMO
http://ccseedsevaders.wordpress.com/2011/10/15/seed-news-salt-spring-seeds/

“Open Letter from World Scientists to All Governments Concerning Genetically Modified Organisms”
Institute of Science in Society letter signed by 828 scientists from 84 countries
www.i-sis.org.uk/list.php

“Vandana Shiva on the Problem with Genetically Modified Seeds”
Bill Moyers video interview with Vandana Shiva, July 13, 2012

Seed and Plant Sanctuary for Canada
http://www.seedsanctuary.com
Charitable organization dedicated to preservation and promotion of heritage seeds

Organic Seed Alliance
www.seedalliance.org

Seed Savers Exchange
www.seedsavers.org

Native Seed Search
www.nativeseeds.org

Organic Farming Organizations

Canadian Organic Growers
http://www.cog.ca/

Master Gardeners of Canada

Alberta www.mgab.org

British Columbia www.mgabc.org

Ontario www.mgoi.ca

Manitoba www.mgmanitoba.com

Maritime Provinces
www.atlanticmastergardeners.com

Quebec
http://www2.ville.montreal.qc.ca/jardin/en/memux.htm

Saskatchewan
http://ccde.usask.ca/mastergardener

Yukon
http://www.yukoncollege.yk.ca/ce/info/gard010

Yukon
http://www.yukoncollege.yk.ca/ce/info/gard010
Ecological Principles

Center for Ecoliteracy
http://www.ecoliteracy.org/essays/ecological-principles

Native Pollinators

Pollination Canada
http://www.pollinationcanada.ca/

Pollinator Partnership Canada
http://pollinatorpartnership.ca/index.html

The Xerces Society
http://www.xerces.org/

Pollinator Conservation Resource Center
http://www.xerces.org/pollinator-resource-center/

Bug Guide
http://bugguide.net/node/view/15740
Site run by dedicated naturalist volunteers, website hosted by Iowa State University

Soil Maps

Canadian Soil Information Service

National Soil DataBase (NSDB)
1E. Further Reading

The structure of this seed saving workshop follows A Seed Saving Guide for Gardeners and Farmers by Organic Seed Alliance. This is available free online and is under the Creative Commons license. The following books are also useful resources.

**Seed Saving Basics**


**Politics**


**Pollinators**


**Plant Breeding**


**Ethnobotany**


**Heirloom Vegetables**


**Heritage Foods**


*Nothing More Comforting: Canada’s Heritage Food.* Dorothy Duncan. Dundurn, 2012


**Communication Skills**

*Toastmaster International* has taught 4 million people worldwide to become competent communicators. www.toastmasters.org

*Nonviolent Communication* developed by Marshall Rosenberg www.cnvc.org or www.youtube.com/watch?v=dpk5Z7G1Fs
# 1F. Workshop Evaluation

Please take a few minutes to review the questions below. This will help us improve the workshop for the next group of participants.

**Presenter________________________________________________**

**Location_________________________________________________**

**Date______________________________________________________**

<table>
<thead>
<tr>
<th>Module</th>
<th>Before the workshop my comprehension and competency of the subject was</th>
<th>After the workshop my comprehension and competency of the subject was</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction Why Save Seeds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Module 1 Reasons for Saving Seed</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Module 2 Choosing the Right Seed</strong></td>
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<td></td>
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<tr>
<td><strong>Module 3 Crop Reproduction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Module 4 BOTANICAL FAMILIES: Recognizing Patterns</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Module 5 Skills and Techniques to Grow and Save Seed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Module 6 Review</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1G. Stay Involved

Would you like to be part of the Bauta Family Initiative on Canadian Seed Security? If so, please take a moment to fill out the form below now or mail to us soon.

Interested in our email list to be notified of future events? If yes, please include your email address.

Are you interested in visiting farms that save seed?
Rate lowest 1 to 10 highest

Do you have experience writing grants or fundraising and could contribute to our cause?
Rate lowest 1 to 10 highest

Are you interested in other related agricultural pursuits: beekeeping, orchards?
Rate lowest 1 to 10 highest

Thank you,

_________________________________________________________________________________________________________________________

Regional Coordinator contact info
2. Trainer Folder

2A. Trainer Folder List
1. Trainer Questionnaire
2. Implement Program Tracking Chart
3. Spinach Crossing Game Cards
4. Glossary Game Cards
5. Trainer Agenda
6. Garden Cart Inventory
7. Tips for Trainer’s Talk

2B. Trainer Questionnaire

Location______________________________________________

Date______________________________________________

Specific questions for each workshop presented:

Lesson 1 Why I Save Seed
Did the PP slides work in tandem with the curriculum? Was the lesson easy to follow? Were you able to get through it all? Did you skip certain slides? If so, which ones and why? Did you practice any of the suggested activities?

Lesson 2 What Seed is Best for Me?
Did the PP slides work in tandem with the curriculum? Was the lesson easy to follow? Were you able to get through it all? Did you skip certain slides? If so, which ones and why? Did you practice any of the suggested activities?

Lesson 3 Crop Rotation
Did the PP slides work in tandem with the curriculum? Was the lesson easy to follow? Were you able to get through it all? Did you skip certain slides? If so, which ones and why? Did you practice any of the suggested activities?
Lesson 4 Plant Taxonomy
Did the PP slides work in tandem with the curriculum? Was the lesson easy to follow? Were you able to get through it all? Did you skip certain slides? If so, which ones and why? Did you practice any of the suggested activities?

Lesson 5 Skills and Techniques for Seed Saving
Did the PP slides work in tandem with the curriculum? Was the lesson easy to follow? Were you able to get through it all? Did you skip certain slides? If so, which ones and why? Did you practice any of the suggested activities?

Specific questions for seed saving workshop activities. Questions listed by each activity:

Activity: Reflective Journal Writing
Description: At the end of a module, participants reflect on pertinent questions as they write in their journal. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

Trainer’s Background: Can you suggest a better way to inform the trainer?

Action: Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?
**Activity: Glossary Game**

*Description:* Participants give a creative fabricated definition of a seed term. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

**Trainer’s Background:** Can you suggest a better way to inform the trainer?

**Action:** Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

**Materials:** Did you follow the list? Would you suggest deleting or adding any materials to the list?

---

**Activity: Seed Buyer’s Guide**

*Description:* Participants will choose seeds for their garden based on several variables. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

**Trainer’s Background:** Can you suggest a better way to inform the trainer?

**Action:** Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?
Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?

Activity: **Floral Anatomy**  
*Description:* Participants dissect flowers.  
Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

*Trainer’s Background:* Can you suggest a better way to inform the trainer?

Action: Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?

Activity: **We Are Seeds Game**  
*Description:* Participants play a game to recognize selection pressures and genetic variability. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

*Trainer’s Background:* Can you suggest a better way to inform the trainer?
Action: Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?

Activity: Save the Heirloom
Description: Participants, guided by the trainer, determine the best plan for saving a hypothetical heirloom seed variety.
Did participants respond favorably? Did the activity seem to fit the skill level of the participants?
Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

Trainer’s Background: Can you suggest a better way to inform the trainer?

Action: Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?

Activity: Crossing Game
Description: Participants look at slides or photos of crops and determine which ones can cross. Actual crops can also be used if seasonally available.
Did participants respond favorably? Did the activity seem to fit the skill level of the participants?
Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?
**Trainer’s Background:** Can you suggest a better way to inform the trainer?

**Action:** Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

**Materials:** Did you follow the list? Would you suggest deleting or adding any materials to the list?

---

**Activity: Seed Cleaning**

*Description:* Trainer demonstrates and participants practice seed cleaning techniques. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

---

**Trainer’s Background:** Can you suggest a better way to inform the trainer?

**Action:** Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

**Materials:** Did you follow the list? Would you suggest deleting or adding any materials to the list?

---

**Activity: Peel the Bean**

*Description:* Participants examine a soaked bean. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?
Trainer’s Background: Can you suggest a better way to inform the trainer?

Action: Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?

Activity: Germination Testing
Description: Participants place 100 seeds in a moist environment to the number sprouting. Did participants respond favorably? Did the activity seem to fit the skill level of the participants? Was it easy for participants to grasp the objective? Did they have fun? Did the activity strengthen their understanding of the module? Were there any people confused and irritated by the activity? Did they say why?

Trainer’s Background: Can you suggest a better way to inform the trainer?

Action: Were the steps clearly described? Do you have any suggestions for rewriting the sequence? Did you develop a different sequence?

Materials: Did you follow the list? Would you suggest deleting or adding any materials to the list?

Can we contact you to discuss this? If so please include your name, email, and number.

Thank you for your contribution!
2C. Implement Program Tracking Chart (*metrics show multiplier effect*)

<table>
<thead>
<tr>
<th>Trainer Name</th>
<th>Workshop Date</th>
<th># of Participants</th>
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</thead>
<tbody>
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</tbody>
</table>
2D. Spinach Crossing Game *(cut up cards for game)*

**Directions:** *If you don’t have a trait that matches the conditions called out by the game leader, then your plant does not survive and you sit down*

<table>
<thead>
<tr>
<th>Early spring conditions: Cold</th>
<th>Summer conditions: Unusually wet, soils become water-logged</th>
<th>Pest problems: aphids and mildew</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not cold hardy</td>
<td>1. Not cold hardy</td>
<td>1. Cold hardy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Germinates in cold soil</td>
<td>1. Germinates in cold soil</td>
<td>1. Germinates in cold soil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Tolerates waterlogged soil</td>
<td>2. Doesn’t tolerate waterlogged soil</td>
<td>2. Tolerates waterlogged soil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Withstands aphid attack</td>
<td>3. Doesn’t withstand aphid attack</td>
<td>3. Tolerates drought</td>
<td></td>
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<td></td>
<td>4. Doesn’t withstand aphid attack</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not cold hardy</td>
<td>1. Doesn’t germinate in cold soil</td>
<td>1. Cold hardy</td>
<td></td>
</tr>
<tr>
<td>3. Resistant to Downy Mildew</td>
<td>3. Not resistant to Downy Mildew</td>
<td>3. Not resistant to Downy Mildew</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Resistant to Downy Mildew</td>
<td>3. Doesn’t withstand aphid attack</td>
<td>3. Resists downy mildew</td>
<td></td>
</tr>
</tbody>
</table>
## 2E. Glossary Game Cards

<table>
<thead>
<tr>
<th></th>
<th>Annual</th>
<th>Open Pollinated Variety</th>
<th>Biennial</th>
<th>Heirloom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fermentation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chaff</td>
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<tr>
<td>Vigor</td>
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<tr>
<td>Isolation</td>
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<table>
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<tbody>
<tr>
<td></td>
<td>Fermentation</td>
<td>Inbreeding Species</td>
<td>Monoecious</td>
<td>Pollination</td>
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<tr>
<td></td>
<td>Chaff</td>
<td>Hybrid</td>
<td>Landrace</td>
<td>Rogue/Rouging</td>
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<tr>
<td></td>
<td>Vigor</td>
<td>Dioecious</td>
<td>Cultivar</td>
<td>In-Breeding Depression</td>
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<tr>
<td></td>
<td>Isolation</td>
<td>Bolt</td>
<td>Population</td>
<td>Viable</td>
</tr>
</tbody>
</table>
2F. Trainer Agenda

**Session 1**
Introductions warm-up game overview
Trainer’s role and responsibilities

**INSTRUCTION: How to use this Curriculum: Build Your Own**

1. A list of participants and their skill level
2. A list of the available plant materials to use for activities
3. You know your experience level with seeds and with training others
4. This workshop will be indoors

**Know yourself: what support do you need?**
- Three Tiers of Seed Saving: own use, swap or sell, genetic preservation
- Before the workshop: get the tools for the cart, understanding how we learn

**GUIDED PRACTICE: Reflection or Group Interaction.** Participants do the exercise and jot down reactions and questions

**BREAK**

Logistical Options Indoors or Outdoors

**INSTRUCTION: How to use the basic PowerPoint presentation**

**GUIDED PRACTICE: How to teach an activity: Example Module 2 Make sure Garden Cart has flower from a florist, magnifying glass, glossary of plant parts**

*Trainers participate in half the modules to experience different components*

**BREAK**

**Session 2**
Introduction
Working with the PowerPoint

**FUNDAMENTAL IDEAS: Here is a chance to describe what is important to you**

**OUTLINE OF POTENTIAL DISCUSSIONS:**

*Seed Should Be Available To All*
- Conglomerates controlling seed chart showing the Worlds Top 10 Seed Companies and quote from Hope Shand
- **JOURNAL REFLECTION:** In this David and Goliath story of seed, what are the major seed companies’ priorities? Are you familiar with any small seed companies? What do they value? Plant breeding for organic farms and gardens is different from plant breeding for chemical farming -- how?

**SEED CONSERVATION:**
- Why are heirlooms important?
- What needs to be done to protect loss of genetic diversity?

**Slide 5 Questions**

Reflection or group interaction break into groups

**ACTIVITY: We are Seeds, Crossing Game**

**REFLECTION OR GROUP INTERACTION:**
- **CROSSING GAME:** nature selection, selecting
- **JOURNAL REFLECTION:** Select a seed and reflect on what traits it has for “natural” survival?

**LUNCH**

**Session 3**
Review Modules 4 through 6
Instruction
Guided Practice
Reflection or Group interaction

**BREAK**

**Session 4**
Instruction
Guided Practice
Reflection or Group interaction

**Session 5**
Wrap up feedback,
Questions and comments
More resources
Form network Google group for interested participants
<table>
<thead>
<tr>
<th><strong>Garden Cart Permanent Tools</strong></th>
<th>Qty.</th>
<th>Return Qty.</th>
<th>Missing</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>Tote for tools and materials</td>
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<tr>
<td>Folding Easel</td>
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<td>Large newsprint and markers</td>
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<tr>
<td>Flip chart</td>
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<tr>
<td>One-minute egg timer for introductions</td>
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<tr>
<td>Participant folders</td>
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<tr>
<td><em>A Seed Saving Guide for Gardeners and Farmers</em></td>
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<td>Journal for reflective writing</td>
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<td>Name tags</td>
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<tr>
<td>Plant family packets</td>
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<tr>
<td>8 Family ID cards</td>
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<tr>
<td>Album</td>
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<td>Seed Saving PowerPoint</td>
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<td>Projector</td>
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<td>Support book: <em>Seeds of Diversity</em></td>
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<td>Support book: <em>The Organic Seed Grower</em></td>
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<td>Support book: <em>Seed to Seed</em></td>
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<td>Flowers to dissect</td>
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<td>Dried plants or seed heads</td>
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<td>Germination Test: Paper towels, marker</td>
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<td>Germination Test: Pre-sprouted seeds</td>
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<td>Peel the Bean: Soaked beans</td>
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<td>Crossing Crops or Photos: Amaranth, broccoli, pumpkin, kabotcha squash</td>
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<tr>
<td>Crossing Crops or Photos: Swiss chard, beets, lacinato kale</td>
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<tr>
<td>7 Crop photos slides</td>
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<td>7 Crop photo laminated</td>
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<td>Seed Buyer’s Guide: Local and national seed catalogs</td>
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<td>Seed Buyer’s Guide: List of vegetable choices for the region</td>
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<td>Cleaning Seeds: Seed saving screens</td>
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<td>Save the Heirloom: <em>A Seed Saving Guide for Gardeners and Farmers</em> chart page 25</td>
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<td>Floral Anatomy: Large flower per student</td>
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<td>Floral Anatomy: Magnifying glass or loop</td>
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<td>Floral Anatomy: 1 large perfect flower per 2 participants</td>
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<td>Game Glossary, Cards</td>
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<td>Workshop Evaluation</td>
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21. Tips for Trainers: Developing a talk to accompany PowerPoint presentation

Principles of effective communication:

- Clear and concise sentences are easiest to understand
- Present information in the simplest manner possible
- Present in a logical order

Effective oral communication:

- The objective is for the participants to gain insight into the details
- State the purpose, this encourages participants to pay attention
- Rephrase it with expressions like: “The point I want to emphasize...”
- “In other words...”, “My main concern with this technique is...”
- Use supporting points to strengthen the main point
- List supporting points first, then return, and provide details
- Use colorful explanation
- Use reasoning that is familiar to listeners
- At the end of a module summarize the main points

Options for handling questions outside the scope of the workshop:

- A flip chart paper where you ‘parking lot’ off-topic questions to address at the end of the workshop
- Staying an extra 30 minutes to speak with individual participants
- Providing your contact information for follow-up questions

Be sure participants understand the message:

Use phrases like,

- “What effect do you think this process will have?”
- “Which of these methods do you think are most important?”
- “Does anyone disagree with that conclusion?”
- If you are unsure of a question’s meaning, ask the listener to repeat it
- If you are still unsure, use phrases: “Do you mean...?” “I’m not sure I understand the question, but I think you are asking...”
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