The Sustainable Agriculture Skills Workbook

A Passport to Mastering and Managing the Risky Business of Farming

Trainee Name: _____________________________
Program: _________________________________
Start Date: _____________
End Date: ______________
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For additional information regarding this document, please email: nesfp@tufts.edu, or call: (978) 654-6745. This document is available in electronic format or as a printed copy. The latter may be obtained by contacting NESFP at the above locations. Please contact New Entry for permission to use any or all of this document for educational purposes.
The creation of this tool would not have been possible without the hard work of many farmers and farm educators who previously came together at venues across the country to develop comprehensive lists and training tools for sustainable agriculture. This Workbook was developed by synthesizing ideas and excerpts from many of those landmark projects and publications including:

- The Specialty Crop Grower Apprentice Checklist by the Center on Education and Training for Employment at The Ohio State University
- The Northeast Small Scale “Sustainable” Farmer DACUM Occupational Profile by the New England Small Farm Institute
- Teaching Organic Farming & Gardening: Resources for Instructors and Teaching Direct Marketing and Small Farm Viability: Resources for Instructors by the UC Santa Cruz Center for Agroecology and Sustainable Food Systems
- The Farms Next Program curriculum by Rogue Farm Corps
- The Vermont New Farmer Project by the University of Vermont Extension Center for Sustainable Agriculture
- The Organic Vegetable Apprentice Reader by Penn State Extension
- The Farm Business Planning Course at the New Entry Sustainable Farming Project

The sustainable agriculture sector needs a tool that will increase the accessibility of a rigorous and comprehensive training experience, the transparency of learning objectives and teaching methods, and the accountability of both trainees and their trainers. The Sustainable Agriculture Skills & Competency Workbook is that tool.

The Workbook presents a universal curriculum for farmer training programs in the United States and an organized, standardized way to progress through it. The curriculum is divided into nineteen “Topics,” each one with a different focus. Each Topic contains a set of relevant skills to master, and each Skill requirement is satisfied by fulfilling three Practices of the concept or task. This way, it is sort of like a report card for learning how to farm.

The application of this Workbook as a journal or record-keeping tool for trainees is just as valuable as its application as a learning framework for trainers.

Credits


Subjects covered include principles of sustainable agriculture, business planning, equipment and facility maintenance, crop planning, plant and soil health, livestock, pest and disease management, marketing, labor management, government regulation, conservation, and more. A list of links to "Learn More" is provided at the end of each Topic section, featuring some of the best books, articles, websites, and tools for delving further into the subject matter.

The Workbook is more of an outline and note-taking tool that can be customized for a specific curriculum rather than a set of lesson plans. Users or administrators can select which Topics and Skills are relevant to their selected learning program. The tool presents a comprehensive list of what can be taught, not what will be taught or how that will be executed. Every farm and training program is unique, and each can use the Workbook as a framework and data tracker.

Intended Audience

The Workbook's adaptability makes it well suited for use by a diverse farmer training audience, from strongly curriculum-based programs at accredited universities to informal internships or apprenticeships on privately owned and operated farms. Its breadth and depth make it useable for instructors and learners at any operation, whether large or small; fruit, vegetable, grain, livestock, or mixed; wholesale or direct market. It can also be used by individuals doing self-directed learning. There is a strong focus on environmentally sustainable practices, economic stability, and human and animal welfare.

Vision Statement

This tool may serve as a standard of skill qualification across farmer training programs in the country. In time, it could become a respected certification credential for individuals who have completed the Workbook, and help agriculturally focused businesses and organizations recognize excellent candidates during the hiring process. Perhaps equally as valuable, it also provides users with a consolidated list of their skill qualifications and most important notes regarding those skills.

Working Definitions

Beginning Farmer – Clearly defined by the USDA as an individual who has not been farming or ranching for more than ten years, and “will materially and substantially participate in the operation of the farm or ranch.”

Farmer Training Program – This is an umbrella term for any formalized educational experience pertaining to agriculture skills, usually with a focus on sustainability.

• Certificate Program – A program in which the trainee receives a certificate from an institution upon successful completion of a determined curriculum and a set number of supervised experiential learning hours. Certificate programs typically require payment of tuition.

• Apprenticeship – A legally binding agreement in which a specific number of the apprentice's labor hours are exchanged for a specific amount of instruction in the agricultural trade. Apprenticeships are usually paid, though some may be unpaid.

• Internship – A position of understudy to a farm employee in which the labor performed is similar to supervised practical training that would be given in an educational environment and is expressly for the educational benefit of the intern. Internships are rarely paid.

• Courses – Either a single or a series of classes provided by a university, community college, extension program, government program, or non-profit organization that pertains to a specific skill or set of sustainable agriculture skills. Courses may require payment of fees.

Trainer – In this context, refers to the individual responsible for the majority of teaching and instruction of the Skills. The Trainer administers the Workbook to the Trainee, is responsible for keeping the Trainee on track, and determines whether the Trainee's completion of the Workbook is satisfactory for Qualification. Trainers may be considered farmers, mentors, instructors, teachers, professors, etc.

Trainee – In this context, refers to the individual being taught and instructed in the Skills. The Trainee is the proprietor of the Workbook, and responsible for completing it to his or her own satisfaction and the satisfaction of the Trainer. Trainees may be considered students, interns, apprentices, etc.

Supervisor – In this context, refers to the individual overseeing a training program's logistics. In many cases this may be the same person fulfilling the role of Trainer, for example on a small farm with only two apprentices. In other cases, a Supervisor may fill an administrative role at a training program at a university where there are multiple Trainers and a larger student body of Trainees.


How To Use This Tool

This tool is designed to help Trainers and their Trainees track their progress as they move through the curriculum. “Trainer” refers to the farmer, mentor, instructor, teacher, professor, etc.; and “Trainee” refers to the student, intern, apprentice, etc. “Supervisor” refers to the individual overseeing the program’s logistics, and in many cases may be the same person filling the roll of Trainer.

First, the Trainer will check off the boxes for which “Topics,” and “Skills” within each Topic, are required for successful completion of the given training program.

The Workbook is then entrusted to the Trainee for the duration of the learning period. Each Skill requirement will be satisfied by fulfilling three “Practices” of the concept or task. What constitutes a Practice should be defined by the Supervisor for each Skill. A Practice can consist of observation, discussion, group or individual skill application. While the three Practices need not occur on three separate days, each should stand as a separate event from the others.

For example, in order to be signed off as “Qualified” in something as specific as Topic F, Skill #2 Prepare soil samples for testing, the Trainee could collect and prepare soil samples for testing on three different sites. In another example, in order to be signed off as “Qualified” in something as broad as Topic B, Skill #6 Secure access to land, the Trainee could attend a farmland matching event, sponsored by a land trust, speak with a bank representative on the subject of loans, and observe a meeting with a potential seller.

Every time a Practice is completed, a description of the activity and the date should be recorded in the designated spaces. Once all three Practices have been completed, the Supervisor and Trainee must initial the designated spaces in the Qualification Table in Appendix I in order for the Trainee to be officially “Qualified” in the skill.

The Comment area provides space for taking down notes, contact information, links, or anything else relevant to the Skill and Practices.

Example

Direct Sow Into Fields

1st Practice
Description: Hand sow corn in Beds 3-6
Date: 3/15/13

2nd Practice
Description: Planted corn using Earthway seeder
Date: 3/22/13

3rd Practice
Description: Planted corn using tractor grain drill
Date: 4/17/13

Comments
- Watch that seeds are dropping from the hoppers at the beginning
- Check for adequate soil coverage
- Good source for garden-scale seeding equipment: www.johnnyseeds.com

Learn More Boxes

These boxes are found on each Topic’s title page. They contain active hyperlinks to some of the best publications, websites, and tools relevant to the Topics.

Learning Contracts

Before engaging in a training program, it is imperative that both the trainer and the trainee establish a mutually agreeable set of learning objectives and expectations. This is often best accomplished through a learning contract. The purpose of such a document is to ensure that all parties are on the same page regarding what will be taught, how it will be taught, when and where it will be taught, the physical, mental and emotional requirements of the program, and the proposed outcomes of the program. The learning contract should stand on its own from any labor contract that a program might entail. See Appendix II for a learning contract template.
Before embarking on the path of learning to farm, it is important to step back and examine your philosophical and literal positions in the agricultural world. Where are you now, and where do you hope to be in five, ten, twenty years? Why do you want to farm? What does it mean to farm sustainably? What values drive your ambition? What are your personal, professional, and family goals in pursuing this lifestyle and career? Once you have answered these questions, it is easier to understand the relevance to you of each skill and concept outlined in this tool.

Learn More

Explore Farming! Course
by New Entry Sustainable Farming Project
Exploring the Small Farm Dream Course and Workbook
by New England Small Farm Institute
Sustainable Vegetable Production from Start-Up to Market
by Vernon P. Grubinger
Making Your Small Farm Profitable
by Ron Macher
Holistic Management: A Whole-Farm Decision Making Framework
by Preston Sullivan

Skill #1 Define sustainable agriculture

1st Practice
Description: ____________________________ Date: __________

2nd Practice
Description: ____________________________ Date: __________

3rd Practice
Description: ____________________________ Date: __________

Comments
____________________________________________________________________________________
____________________________________________________________________________________
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Skill #2 Define personal and professional values

1st Practice
Description: ____________________________ Date: __________

2nd Practice
Description: ____________________________ Date: __________

3rd Practice
Description: ____________________________ Date: __________

Comments
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Topic A: Defining Principles
Skill #3  Define personal and professional mission

1st Practice
Description: ____________________________ Date: __________

2nd Practice
Description: ____________________________ Date: __________

3rd Practice
Description: ____________________________ Date: __________

Comments
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Skill #4  Set short- and long-term farming goals

1st Practice
Description: ____________________________ Date: __________

2nd Practice
Description: ____________________________ Date: __________

3rd Practice
Description: ____________________________ Date: __________

Comments
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Skill #5  Establish physical, mental, and emotional health and safety guidelines

1st Practice
Description: ____________________________ Date: __________

2nd Practice
Description: ____________________________ Date: __________

3rd Practice
Description: ____________________________ Date: __________

Comments
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Skill #6  Identify action steps for moving toward goals while staying true to values and guidelines

1st Practice
Description: ____________________________ Date: __________

2nd Practice
Description: ____________________________ Date: __________

3rd Practice
Description: ____________________________ Date: __________

Comments
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Topic B
Farm Business Planning

The idea of getting your hands dirty, spending time in nature, working with soil, plants, and animals to produce food for people has enormous appeal, especially since most people are several generations removed from the farming lifestyle. But if you intend to sell any of your bounty, it is important to get past the romantic idyll of farming and do some research to see how feasible your ideas are. The business plan is where all of the moving parts of the farm come together, measured in words, numbers, and time.

If your farm start-up will require a loan, you will need to have a solid business plan in place in order to obtain it. Even if you are self-financing your operation, it is a really good idea to have at least an outline of a plan, to demonstrate the feasibility of your idea. Even if your farm will not be your primary income source, the sooner you learn to think of it as a business, the more successful you are likely to be.

Learn More

Farm Business Planning Course
by New Entry Sustainable Farming Project

Business Plan Templates
by the Northeast Beginning Farmer Project at Cornell University

Farm Management Resources
by the University of California Small Farms Program

Land Access and Tenure Toolshed
by University of Vermont Extension

Building a Sustainable Business: A Guide to Developing a Business Plan for Farms and Rural Businesses
by the Minnesota Institute for Sustainable Agriculture

by Richard Wiswall

Skill #1
Assess overall needs (e.g. physical, capital, human; skills, experience, time, land, equipment, profitability)

1st Practice
Description: ________________________ Date: __________

2nd Practice
Description: ________________________ Date: __________

3rd Practice
Description: ________________________ Date: __________

Comments
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Skill #2
Assess available resources (e.g. physical, capital, human; skills, experience, time, land, equipment, profitability)

1st Practice
Description: ________________________ Date: __________

2nd Practice
Description: ________________________ Date: __________

3rd Practice
Description: ________________________ Date: __________

Comments
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Skill #3  Conduct market research and competitive analysis (e.g. research potential competition, markets, customers, and strategies)

1st Practice
Description: __________________________ __________________________ Date: ________

2nd Practice
Description: __________________________ __________________________ Date: ________

3rd Practice
Description: __________________________ __________________________ Date: ________

Comments
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Skill #4  Prepare enterprise budgets and select enterprise(s)

1st Practice
Description: __________________________ __________________________ Date: ________

2nd Practice
Description: __________________________ __________________________ Date: ________

3rd Practice
Description: __________________________ __________________________ Date: ________

Comments
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Skill #5  Prepare financial plan (e.g. annual budget, expense and sales forecasts, cash flow projections, breakeven analysis, capitalization plan)

1st Practice
Description: __________________________ __________________________ Date: ________

2nd Practice
Description: __________________________ __________________________ Date: ________

3rd Practice
Description: __________________________ __________________________ Date: ________

Comments
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Skill #6  Secure access to land

1st Practice
Description: __________________________ __________________________ Date: ________

2nd Practice
Description: __________________________ __________________________ Date: ________

3rd Practice
Description: __________________________ __________________________ Date: ________

Comments
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Skill #7 Assess site (e.g. map and analyze soils, topography, water, drainage, infrastructure, climate and microclimates)

1st Practice
Description: ____________________________ Date: _______

2nd Practice
Description: ____________________________ Date: _______

3rd Practice
Description: ____________________________ Date: _______

Comments
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Skill #8 Research legal requirements (e.g. zoning, business structure, liability, tax abatement options, development rights)

1st Practice
Description: ____________________________ Date: _______

2nd Practice
Description: ____________________________ Date: _______

3rd Practice
Description: ____________________________ Date: _______

Comments
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Skill #9 Determine management style

1st Practice
Description: ____________________________ Date: _______

2nd Practice
Description: ____________________________ Date: _______

3rd Practice
Description: ____________________________ Date: _______

Comments
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Skill #10 Assemble whole farm business plan (e.g. mission statement, objectives, timelines, budgets, labor, equipment, infrastructure, supply sourcing, crop plan, marketing plan, one year, five year, and long term plans)

1st Practice
Description: ____________________________ Date: _______

2nd Practice
Description: ____________________________ Date: _______

3rd Practice
Description: ____________________________ Date: _______

Comments
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Once a plan is in place, there are many steps in translating it to physical reality – from financing to getting insured to recordkeeping. It can be surprising and even frustrating to face all of the office-related tasks that farming requires when all you really want to do is get your hands into the soil and fresh food onto the table. But a sound business structure is the strongest foundation there is for a successful farm.

Learn More

- The Guide to Financing the Community Supported Farm by University of Vermont Extension
- The U.S. Small Business Administration
- The Risk Management Agency of the USDA
- Record-Keeping Software for Small Farms by Ag Squared
Skill #3  Establish farm management team (e.g. create management and professional job descriptions; hire lawyer, accountant, and others; hire non-labor employees; establish service contracts)

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #4  Establish farm policies (e.g. visitor, safety, personnel)

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #5  Obtain necessary licenses, permits and certifications (e.g. federal employer ID#, fuel storage, farm labor camp, tax exemption, organic certification, certified kitchen)

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #6  Open business bank accounts

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #7  Purchase liability and property insurance

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
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Skill #8  Establish credit with key suppliers

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
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Skill #9  Obtain necessary office equipment and supplies

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
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Skill #10  Set up bookkeeping system (e.g. cash journal, asset ledger, payables and receivables; by hand or on computer)

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
____________________________________________________________________________________
____________________________________________________________________________________
Maintaining Equipment & Facilities

It is easy to let the care of farm tools and infrastructure fall behind at the beginning or end of a long day in the field. However, small daily investments add up to immense value over time. Sharpening your snips in the morning makes for cleaner, faster cuts that are less susceptible to disease. Brushing soil off your spade before hanging it up lengthens its lifespan by reducing the risk of rust. Cleaning the tractor with compressed air after use reduces the risk of spreading weed seeds around the property. Weather-stripping the greenhouse door will increase energy efficiency and reduce drafts that stress seedlings. Being a good farmer means being a good caretaker of your assets – whether it is a harvest knife, a tractor, or an entire building.

Learn More

Information on How to Buy, Rent and Choose Equipment for Farm Start-ups
by Penn State Extension
Equipment and Tools for Small-Scale Intensive Crop Production
by Andy Pressman
From Tinkering to Torquing: A Beginner’s Guide to Tractors and Tools
by Roger Welsch
High Tunnels: Using Low-Cost Technology to Increase Yields, Improve Quality and Extend the Season
by Ted Blomgren and Tracy Frisch
**Skill #1** Inspect production equipment and facilities

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
____________________________________________________________________________________
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**Skill #2** Adhere to federal, state and local legal and regulatory requirements (e.g. zoning, permits, building codes, fuel and pesticide storage)

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
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**Skill #3** Build/install infrastructure

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
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**Skill #4** Create farm signage (e.g. promotional, safety, traffic, posting)

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
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____________________________________________________________________________________
Skill #5  Establish preventive maintenance schedule for infrastructure

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #6  Establish parts and supplies inventory

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #7  Repair production facilities

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #8  Repair production equipment

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #9  Upgrade inefficient equipment

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #10  Acquire necessary tools, equipment, and supplies

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #11  Calibrate production equipment

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #12  Perform routine equipment service (e.g. sharpening blades, changing oil, greasing equipment, cleaning tractor)

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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<table>
<thead>
<tr>
<th>Skill #13</th>
<th>Clean production equipment</th>
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<tbody>
<tr>
<td>1st Practice</td>
<td>Description: __________ Date: ________</td>
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<tr>
<td>2nd Practice</td>
<td>Description: __________ Date: ________</td>
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<tr>
<td>3rd Practice</td>
<td>Description: __________ Date: ________</td>
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<table>
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<tr>
<th>Skill #14</th>
<th>Clean harvest containers</th>
</tr>
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<tbody>
<tr>
<td>1st Practice</td>
<td>Description: __________ Date: ________</td>
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<tr>
<td>2nd Practice</td>
<td>Description: __________ Date: ________</td>
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<td>3rd Practice</td>
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<table>
<thead>
<tr>
<th>Skill #15</th>
<th>Calibrate product scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Practice</td>
<td>Description: __________ Date: ________</td>
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<tr>
<td>2nd Practice</td>
<td>Description: __________ Date: ________</td>
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<table>
<thead>
<tr>
<th>Skill #16</th>
<th>Store tools, equipment and supplies (e.g. safely, in good order)</th>
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<tbody>
<tr>
<td>1st Practice</td>
<td>Description: __________ Date: ________</td>
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<tr>
<td>2nd Practice</td>
<td>Description: __________ Date: ________</td>
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<td>3rd Practice</td>
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A crop plan describes in great detail what, where, when, how, and how much will be planted. It is closely tied to your marketing plan and cash flow analysis. A good plan instills confidence that everything you raise is worth your investment. It also serves as a record to refer back to in the future to inform changes. If you observe that one carrot variety grows better than the others, you will know to focus on it in next year’s crop plan. If you bring in more money from peppers than okra at the farmers market, you will know to devote more space to peppers and less to okra next year. While crop planning may seem arduous and complicated at first, it gets easier with each season of experience.

Learn More

Crop Production Topics Webinars
  by University of Vermont Extension
Crop Planning for Organic Vegetable Growers
  by Frederic Theriault and Daniel Brisebois
Crop Rotation on Organic Farms: A Planning Manual
  by Charles L. Mohler and Sue Ellen Johnson, editors
Skill #3 Establish crop planting schedule and record keeping system

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments ____________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

Skill #4 Design field layout (e.g., succession planting, crop rotation, roads and walkways, borders)

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments ____________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

Skill #5 Establish multi-year crop rotation plan

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments ____________________________________________________________________________________
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Skill #6 Select plant varieties

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments ____________________________________________________________________________________
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Skill #7  Review pest and weed management options

1st Practice
Description: ________________________________________________________    Date:  __________

2nd Practice
Description: ________________________________________________________    Date:  __________

3rd Practice
Description: ________________________________________________________    Date:  __________

Comments
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Skill #8  Order field supplies (e.g. labels, stakes, trellises, twine)

1st Practice
Description: ________________________________________________________    Date:  __________

2nd Practice
Description: ________________________________________________________    Date:  __________

3rd Practice
Description: ________________________________________________________    Date:  __________

Comments
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Skill #9  Plan for crop breeding and seed saving

1st Practice
Description: ________________________________________________________    Date:  __________

2nd Practice
Description: ________________________________________________________    Date:  __________

3rd Practice
Description: ________________________________________________________    Date:  __________

Comments
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Topic E: Seasonal Crop Production Planning

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Topic E: Seasonal Crop Production Planning
Skill #1  Understand the physical, biological, and chemical properties of soil

1st Practice  
**Description:** __________________________________________________________  
**Date:** __________

2nd Practice  
**Description:** __________________________________________________________  
**Date:** __________

3rd Practice  
**Description:** __________________________________________________________  
**Date:** __________

Comments  
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______________________________________________________________________________  
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Skill #2  Prepare soil samples for testing

1st Practice  
**Description:** __________________________________________________________  
**Date:** __________

2nd Practice  
**Description:** __________________________________________________________  
**Date:** __________

3rd Practice  
**Description:** __________________________________________________________  
**Date:** __________

Comments  
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______________________________________________________________________________  
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Topic F
Soil Maintenance

Some say that a farmer’s greatest asset is his or her soil. The farm is nothing if its soil cannot support healthy, productive plants and animals. You must understand its physical structure, its biology, its chemistry, and its relationship to you and your crops. All that is taken from the soil in the forms of organic matter and nutrients must be not only restored but improved under your management. This involves regular testing, interpretation, observation, incorporation of amendments, water management, and appropriate tillage.

Learn More

- The Nature and Properties of Soil  
  by Nyle C. Brady and Ray R. Weil
- Building Soils for Better Crops  
  by Fred Magdoff and Harold van Es
- Soil Test Interpretation Guide  
  by D.A. Horneck, D.M. Sullivan, J.S. Owen, and J.M. Hart
- Soil & Compost Resources  
  by the National Sustainable Agriculture Information Service
- Soil Resources  
  by Penn State Extension
- Using Organic Nutrient Sources  
  by Penn State Extension
- Cover Crop Topic Room  
  by Sustainable Agriculture Research and Education (SARE)
Skill #3  Read and interpret soil test results

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
____________________________________________________________________________________
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____________________________________________________________________________________

Skill #4  Classify soil texture and type

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #5  Develop fertility program and record keeping system

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #6  Select and acquire cover crop varieties

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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____________________________________________________________________________________
Skill #7  Select and acquire soil amendments (e.g., compost, minerals)

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Skill #8  Build and maintain certified compost piles

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Skill #9  Manage soil pH

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Skill #10  Implement ongoing fertility management

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Topic F: Soil Maintenance
Skill #11  Manage cover crop in fields

- **1st Practice**
  - Description: ____________________________ Date: __________

- **2nd Practice**
  - Description: ____________________________ Date: __________

- **3rd Practice**
  - Description: ____________________________ Date: __________

Comments
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Skill #12  Assess appropriate soil moisture levels for tillage (e.g. 50 to 75% field capacity)

- **1st Practice**
  - Description: ____________________________ Date: __________

- **2nd Practice**
  - Description: ____________________________ Date: __________

- **3rd Practice**
  - Description: ____________________________ Date: __________

Comments
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Skill #13  Lay out beds

- **1st Practice**
  - Description: ____________________________ Date: __________

- **2nd Practice**
  - Description: ____________________________ Date: __________

- **3rd Practice**
  - Description: ____________________________ Date: __________

Comments
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Skill #14  Understand the basic functions, safety features, and operations of a tractor and its implements

- **1st Practice**
  - Description: ____________________________ Date: __________

- **2nd Practice**
  - Description: ____________________________ Date: __________

- **3rd Practice**
  - Description: ____________________________ Date: __________

Comments
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Skill #15  Hitch implements and drive tractor

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #16  Do primary tillage (e.g., plow, rototill, double dig)

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #17  Do secondary tillage (e.g. disc, spader, rake)

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
____________________________________________________________________________________
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____________________________________________________________________________________

Skill #18  Shape beds

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Every plant starts with a seed, tuber, bulb, corm, rhizome, or cutting. Much care is involved in supporting new plant life, from providing an adequate germination environment to monitoring seedlings for pathogens. The period of time between germination and planting out into the field is one of the most vulnerable, but also one of the most exciting to witness.

Learn More

Starting Seeds Indoors
by Michael N. Dana and B. Rosie Lerner

Potting Media and Plant Propagation
by Penn State Extension

Plug and Transplant Production for Organic Systems
by Lane Greer

Grafting and Propagating Fruit Trees
by Penn State Extension

Skill #1  Learn about different types of propagation facilities (heated vs. passive solar greenhouses, high tunnels, etc.)

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
____________________________________________________________________________________
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Skill #2  Develop greenhouse seeding calendar and schedule

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
○ Skill #3 Develop labeling system

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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○ Skill #4 Prepare propagation medium mixes

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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○ Skill #5 Acquire appropriate growing containers

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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○ Skill #6 Start seeds in containers

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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__________________________________________________________________________
__________________________________________________________________________
Skill #7  Direct sow into fields

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #8  Plant bulbs/tubers

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #9  Take cuttings for asexual propagation

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #10  Root or graft cuttings

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
____________________________________________________________________________________
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○ **Skill #11** Monitor seedling development

1st Practice
Description: __________________________ Date: __________

2nd Practice
Description: __________________________ Date: __________

3rd Practice
Description: __________________________ Date: __________

Comments
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○ **Skill #12** Maintain seedlings (e.g., moisture, temperature, fertility, thinning, potting up, pests, hardening off)

1st Practice
Description: __________________________ Date: __________

2nd Practice
Description: __________________________ Date: __________

3rd Practice
Description: __________________________ Date: __________

Comments
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○ **Skill #13** Manage propagation facility

1st Practice
Description: __________________________ Date: __________

2nd Practice
Description: __________________________ Date: __________

3rd Practice
Description: __________________________ Date: __________

Comments
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○ **Skill #14** Acquire transplants

1st Practice
Description: __________________________ Date: __________

2nd Practice
Description: __________________________ Date: __________

3rd Practice
Description: __________________________ Date: __________

Comments
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Skill #15  Transplant into field

1st Practice
Description: ________________________________________________________  Date: __________

2nd Practice
Description: ________________________________________________________  Date: __________

3rd Practice
Description: ________________________________________________________  Date: __________

Comments
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Once all the plans are written, all the seeds are sown, and all the chicks are peeping, a complex dance of daily physical tasks begins. Each variety of crop or animal has its own set of needs. Leeks must be hilled; carrots must be thinned; tomatoes need deep irrigation; and everything needs to be weeded constantly. Keeping a log of daily activities and the time devoted to each one will help improve your planning and management of them as time goes on.

Learn More

Irrigation for Fruit and Vegetable Production
by Penn State Extension

Irrigation Management Basics
by Chip Bubl

Irrigation Overview
by Clemson University Extension

Water Quality, Conservation, Drought and Irrigation Resources
by the National Sustainable Agriculture Information Service
○ **Skill #1** Recognize signs and effects of water stress

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
____________________________________________________________________________________
____________________________________________________________________________________
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○ **Skill #2** Assess soil moisture and irrigation needs in planted beds

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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○ **Skill #3** Consider costs and benefits of different irrigation systems

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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____________________________________________________________________________________
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○ **Skill #4** Acquire and set up irrigation system

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Skill #5  Maintain water quality

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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Skill #6  Determine irrigation needs and create schedule

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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Skill #7  Keep good records of irrigation activity

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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________________________________________________________________________
Once all the plans are written, all the seeds are sown, and all the chicks are peeping, a complex dance of daily physical tasks begins. Each variety of crop or animal has its own set of needs. Leeks must be hilled; carrots must be thinned; tomatoes need deep irrigation; and everything needs to be weeded constantly. Keeping a log of daily activities and the time devoted to each one will help improve your planning and management of them as time goes on.

Learn More

Steel in the Field: A Farmer’s Guide to Weed Management Tools
by Greg Bowman
Training and Pruning Fruit Trees
by North Carolina Cooperative Extension Service at North Carolina State University
Skill #3  Identify and remove weeds

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
____________________________________________________________________________________
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Skill #4  Apply appropriate fertilizers

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
____________________________________________________________________________________
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Skill #5  Hill crops (e.g. potatoes, leeks)

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #6  Thin crops (e.g. carrots, salad mix)

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #7 Assess fertility requirements

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #8 Mulch crops

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #9 Construct and install supports (e.g. fences, trellises, stakes)

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #10 Prune Plants

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #11  Train plants

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Skill #12  Tip plants

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

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Skill #13  Provide supplemental pollination

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Skill #14  Adhere to federal, state and local regulations (e.g. Animal and Plant Health Inspection Service, pesticide regulations)

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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____________________________________________________________________________________
Skill #15  Keep good records (e.g. planting and harvest dates, inputs, yields, crop health)

1st Practice
Description: ________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________ Date: __________

Comments
____________________________________________________________________________________
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Topic J
Dealing With Environmental Variables

As if there was not already enough to stay on top of, the environment brings surprises all the time. Too much rain, too little rain, hail, frost, and all manner of critters can wreak havoc. A farmer must always be planning ahead, monitoring the forecast and the fields, and be ready to respond around the clock. Part of the beauty of farming is the inherent risk of being inextricably linked to the natural world.

Learn More
by Mary Louise Flint
Manage Insects on Your Farm: A Guide to Ecological Strategies
by Miguel A. Altieri and Clara I. Nicholls with Marlene A. Fritz
Pest Management Resources from the National Sustainable Agriculture Information Service
Season Extension Topic Room by Sustainable Agriculture Research and Education (SARE)
○ **Skill #1** Monitor growing environment

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
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○ **Skill #2** Check weather forecast and create response plan

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
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○ **Skill #3** Scout for pests (e.g. microfauna, macrofauna, diseases, weeds)

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
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○ **Skill #4** Evaluate pest damage

1st Practice
- Description: ___________________________________________ Date: __________

2nd Practice
- Description: ___________________________________________ Date: __________

3rd Practice
- Description: ___________________________________________ Date: __________

Comments
____________________________________________________________________________________
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Skill #5  Determine protective measures for crops

1st Practice
Description: ____________________________ Date: ______

2nd Practice
Description: ____________________________ Date: ______

3rd Practice
Description: ____________________________ Date: ______

Comments
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Skill #6  Apply row covers

1st Practice
Description: ____________________________ Date: ______

2nd Practice
Description: ____________________________ Date: ______

3rd Practice
Description: ____________________________ Date: ______

Comments
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Skill #7  Install protective structures (e.g. wildlife fences, bird netting, root cages)

1st Practice
Description: ____________________________ Date: ______

2nd Practice
Description: ____________________________ Date: ______

3rd Practice
Description: ____________________________ Date: ______

Comments
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Skill #8  Install rodent traps

1st Practice
Description: ____________________________ Date: ______

2nd Practice
Description: ____________________________ Date: ______

3rd Practice
Description: ____________________________ Date: ______

Comments
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Topic J: Dealing With Environmental Variables
○ **Skill #9** Apply pesticides

1st Practice  
Description: ________________________________________________________ Date: __________

2nd Practice  
Description: ________________________________________________________ Date: __________

3rd Practice  
Description: ________________________________________________________ Date: __________

Comments  
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○ **Skill #10** Release beneficial insects

1st Practice  
Description: ________________________________________________________ Date: __________

2nd Practice  
Description: ________________________________________________________ Date: __________

3rd Practice  
Description: ________________________________________________________ Date: __________

Comments  
____________________________________________________________________________________
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○ **Skill #11** Apply frost protection measures

1st Practice  
Description: ________________________________________________________ Date: __________

2nd Practice  
Description: ________________________________________________________ Date: __________

3rd Practice  
Description: ________________________________________________________ Date: __________

Comments  
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○ **Skill #12** Install high/low tunnels

1st Practice  
Description: ________________________________________________________ Date: __________

2nd Practice  
Description: ________________________________________________________ Date: __________

3rd Practice  
Description: ________________________________________________________ Date: __________

Comments  
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Skill #13 Identify and implement season extension methods

1st Practice
Description: ________________________________________________ Date: _________

2nd Practice
Description: ________________________________________________ Date: _________

3rd Practice
Description: ________________________________________________ Date: _________

Comments
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Topic K
Managing the Harvest

There is a lot to coordinate when it comes to getting your crop out of the field and ready to go to the farmers market, CSA, or wholesale account. You must keep up with harvesting at appropriate intervals, handle crops and livestock properly to ensure quality, package them appropriately, and maintain good records of the process.

Learn More

Guidelines for Harvesting Vegetables
by Cornell Cooperative Extension
Plain Language Guide to Harvesting Your Crops
by New Entry Sustainable Farming Project
Post-Harvest Handling of Fruits and Vegetables
by Janet Bachmann and Richard Earles
Food Safety Webinars
from University of Vermont Extension
○ **Skill #1** Determine crop maturity

1st Practice
- Description: _____________________________ Date: _________

2nd Practice
- Description: _____________________________ Date: _________

3rd Practice
- Description: _____________________________ Date: _________

Comments

____________________________________________________________________________________
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○ **Skill #2** Understand the requirements and implications of food safety

1st Practice
- Description: _____________________________ Date: _________

2nd Practice
- Description: _____________________________ Date: _________

3rd Practice
- Description: _____________________________ Date: _________

Comments

____________________________________________________________________________________
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○ **Skill #3** Determine harvest requirements

1st Practice
- Description: _____________________________ Date: _________

2nd Practice
- Description: _____________________________ Date: _________

3rd Practice
- Description: _____________________________ Date: _________

Comments

____________________________________________________________________________________
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○ **Skill #4** Provide harvest aids (e.g., knives, buckets, scissors)

1st Practice
- Description: _____________________________ Date: _________

2nd Practice
- Description: _____________________________ Date: _________

3rd Practice
- Description: _____________________________ Date: _________

Comments

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Skill #5  Hand-harvest crops

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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Skill #6  Provide sun protection to harvested crops

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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Skill #7  Field pack crops

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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Skill #8  Rinse harvested crops

1st Practice
Description: ________________________________________________________    Date: __________

2nd Practice
Description: ________________________________________________________    Date: __________

3rd Practice
Description: ________________________________________________________    Date: __________

Comments
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Skill #9  Grade harvested produce

1st Practice
Description: ____________________________________________ Date: ________

2nd Practice
Description: ____________________________________________ Date: ________

3rd Practice
Description: ____________________________________________ Date: ________

Comments
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Skill #10  Bunch harvested produce

1st Practice
Description: ____________________________________________ Date: ________

2nd Practice
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3rd Practice
Description: ____________________________________________ Date: ________

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Skill #11  Maintain harvest records

1st Practice
Description: ____________________________________________ Date: ________

2nd Practice
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3rd Practice
Description: ____________________________________________ Date: ________

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Skill #12  Pre-cool harvested produce

1st Practice
Description: ____________________________________________ Date: ________

2nd Practice
Description: ____________________________________________ Date: ________

3rd Practice
Description: ____________________________________________ Date: ________

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Skill #13  Process or add value to crops

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
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Even though most of this Workbook focuses on crop production, raising animals for food is just as involved. The difference between raising animals as a hobby and raising them as a farm enterprise is like the difference between keeping houseplants and running a market garden. You’ll have to do a lot more than just keep the animals alive if you want to make any profit. Keeping your animals healthy is essential, of course, but it’s also the easy part. The hard part is figuring out how to make your livestock or poultry enterprise profitable—tracking and controlling your costs, figuring out how to improve your animals’ productivity without sacrificing their health or too much of your labor, and using creative marketing to get the best returns for the end product.

Learn More

Livestock Resources
from Penn State Extension

Livestock Webinars
from University of Vermont Extension

Livestock Production and Grazing Information
from University of Vermont Extension

Livestock Production Resources
from Oregon State University Small Farms Program

Pasture Management Resources
from the Oregon State University Small Farms Program

Poultry Processing Resources
from New Entry Sustainable Farming Project
Skill #1  Prepare annual livestock and animal products production plan (e.g. stocking, rotation, feeding and grazing, health, production goals)

1st Practice
Description: ___________________________ Date: _______

2nd Practice
Description: ___________________________ Date: _______

3rd Practice
Description: ___________________________ Date: _______

Comments
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Skill #2  Obtain stock (e.g. breed on farm or buy in)

1st Practice
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2nd Practice
Description: ___________________________ Date: _______

3rd Practice
Description: ___________________________ Date: _______

Comments
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Skill #3  Provide stock with appropriate housing, shelter and protection from predators

1st Practice
Description: ___________________________ Date: _______

2nd Practice
Description: ___________________________ Date: _______

3rd Practice
Description: ___________________________ Date: _______

Comments
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Skill #4  Establish flock or animal ID system

1st Practice
Description: ___________________________ Date: _______

2nd Practice
Description: ___________________________ Date: _______

3rd Practice
Description: ___________________________ Date: _______

Comments
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### Skill #5  Assess space, heat, nutrient, and behavioral needs of animals

<table>
<thead>
<tr>
<th>Practice</th>
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Comments

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### Skill #6  Establish grazing system plan that maintains soil health and biodiversity

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<td>3rd Practice</td>
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Comments

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### Skill #7  Manage pastures

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Comments

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### Skill #8  Obtain feed and supplements (e.g. produce on farm or buy in)

<table>
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<td>3rd Practice</td>
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Comments

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Skill #9 Balance feed rations

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #10 Establish schedule for feeding and watering animals

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #11 Monitor animal health and wellbeing

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
____________________________________________________________________________________
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Skill #12 Meet all animal health and veterinary needs

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

Comments
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Skill #13  Study the processes of gestation and birth

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
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Skill #14  Manage waste products (e.g. litter, manure, livestock mortalities)

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
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Skill #15  Harvest animal products (e.g. milk, eggs, fleece, honey)

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
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Skill #16  Slaughter meat animals

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
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Skill #17  Perform post-harvest handling and processing tasks (e.g. pasteurize, bottle, wash, process, butcher, package, freeze, store)

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #18  Add value to animal products if required by marketing plan

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #19  Adhere to federal, state and local regulations (e.g. slaughtering and processing, manure)

1st Practice
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2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Skill #20  Keep good records (e.g., herd or flock ID numbers, purchase and sales, general health, feed and supplements, breeding, processing, treatments [parasite control, medications])

1st Practice
Description: ___________________________________________ Date: __________

2nd Practice
Description: ___________________________________________ Date: __________

3rd Practice
Description: ___________________________________________ Date: __________

Comments
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Topic L: Raising Livestock
Successful coordination and delivery of your farm’s product involves many well-planned steps. You don’t want all of your hard work to be for nothing by showing up at a restaurant’s door with lettuce that is wilted or the wrong variety or the wrong quantity. Once all the lettuce is in from the fields, washed, and packed, where will it go? How will you keep it at a proper temperature and moisture until it reaches its destination? In what order will you pack the delivery vehicle to reduce the amount of box shuffling at each stop? What is the most efficient route to travel? If you are taking it to the farmers market, how will you keep track of what you do not sell?

Learn More

Recommendations for Maintaining Postharvest Quality
by UC Davis Postharvest Technology
Transporting Produce Safely
by University of Georgia Cooperative Extension, Clemson Cooperative Extension, and Virginia Cooperative Extension
Skill #3  Cold store product prior to delivery

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments
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Skill #4  Establish delivery times and pickup points

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments
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Skill #5  Load products

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments
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Skill #6  Plan delivery route

1st Practice
Description: ________________________________________________________ Date: ________

2nd Practice
Description: ________________________________________________________ Date: ________

3rd Practice
Description: ________________________________________________________ Date: ________

Comments
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Skill #7  Deliver products

1st Practice
Description: ___________________________________________________________________________ Date: __________

2nd Practice
Description: ___________________________________________________________________________ Date: __________

3rd Practice
Description: ___________________________________________________________________________ Date: __________

Comments____________________________________________________________________________________
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Skill #8  Maintain return inventory

1st Practice
Description: ___________________________________________________________________________ Date: __________

2nd Practice
Description: ___________________________________________________________________________ Date: __________

3rd Practice
Description: ___________________________________________________________________________ Date: __________

Comments____________________________________________________________________________________
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Skill #9  Total sales

1st Practice
Description: ___________________________________________________________________________ Date: __________

2nd Practice
Description: ___________________________________________________________________________ Date: __________

3rd Practice
Description: ___________________________________________________________________________ Date: __________

Comments____________________________________________________________________________________
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Managing people is wildly different from managing plants. First, you must find the right people to hire. Second, you must make sure that you are following all state and federal rules and regulations that accompany employment. Third, you must provide a safe and efficient work environment and adequate instruction. Fourth, you must communicate expectations and develop a functional schedule. Finally, you must consistently observe, evaluate, critique, reward, and resolve issues. Many farms hire managers specifically for the crew because the human labor component is so complex in itself that it can consume more time than an owner or operator can devote. This depends greatly on the size of the farm, the size of the labor force, the level of mechanization, and the various duties for which the owner or operator is responsible.

Learn More

- Labor Management in Agriculture: Cultivating Personnel Productivity by Gregory Encina Billikopf
- Positive Practices in Farm Labor Management: Keeping Your Employees Happy and Your Production Profitable by the California Institute for Rural Studies and the National Center for Appropriate Technology
- Labor on the Farm: Running a Successful Farm Business by Washington State Department of Agriculture
- Farm Safety Webinars from University of Vermont Extension
Skill #3  Fill out necessary state and federal labor forms

1st Practice
Description: ________________________________________________________ Date: _________

2nd Practice
Description: ________________________________________________________ Date: _________

3rd Practice
Description: ________________________________________________________ Date: _________

Comments
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Skill #4  Recruit labor (e.g. word of mouth, email, online databases, etc.)

1st Practice
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2nd Practice
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3rd Practice
Description: ________________________________________________________ Date: _________

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Skill #5  Establish labor contract

1st Practice
Description: ________________________________________________________ Date: _________

2nd Practice
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3rd Practice
Description: ________________________________________________________ Date: _________

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Skill #6  Develop policies and procedures

1st Practice
Description: ________________________________________________________ Date: _________

2nd Practice
Description: ________________________________________________________ Date: _________

3rd Practice
Description: ________________________________________________________ Date: _________

Comments
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Skill #7  Remove safety hazards

1st Practice
Description: ___________________________ Date: __________

2nd Practice
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3rd Practice
Description: ___________________________ Date: __________

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Skill #8  Conduct farm orientation (e.g. health and safety issues, “where things are”)

1st Practice
Description: ___________________________ Date: __________

2nd Practice
Description: ___________________________ Date: __________

3rd Practice
Description: ___________________________ Date: __________

Comments
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Skill #9  Develop staff work schedule

1st Practice
Description: ___________________________ Date: __________

2nd Practice
Description: ___________________________ Date: __________

3rd Practice
Description: ___________________________ Date: __________

Comments
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Skill #10  Assign daily tasks

1st Practice
Description: ___________________________ Date: __________

2nd Practice
Description: ___________________________ Date: __________

3rd Practice
Description: ___________________________ Date: __________

Comments
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.skill #11 train farm workers (e.g. fieldwork, efficiency, equipment safety and care)

1st practice
Description: ________________________________________________________ Date: __________

2nd practice
Description: ________________________________________________________ Date: __________

3rd practice
Description: ________________________________________________________ Date: __________

comments
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skill #12 supervise farm workers

1st practice
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2nd practice
Description: ________________________________________________________ Date: __________

3rd practice
Description: ________________________________________________________ Date: __________

comments
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skill #13 provide staff incentives

1st practice
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2nd practice
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3rd practice
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skill #14 evaluate staff work performance

1st practice
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Description: ________________________________________________________ Date: __________

3rd practice
Description: ________________________________________________________ Date: __________

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topic n: managing labor
Skill #15  Conduct regular staff meetings

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

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Skill #16  Resolve employee issues

1st Practice
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2nd Practice
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3rd Practice
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Skill #17  Provide bathroom, hand-washing facilities, access to clean water and shade

1st Practice
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2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

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Skill #18  Maintain First Aid and CPR certification

1st Practice
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2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

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Skill #19  Adhere to all state and federal labor regulations (e.g., employment laws; farm property tax abatements programs; volunteer protection; product and general liability; risk management)

1st Practice  
Description: ____________________________ Date: ________

2nd Practice  
Description: ____________________________ Date: ________

3rd Practice  
Description: ____________________________ Date: ________

Comments  
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Skill #20  Keep good records (e.g. time sheets, labor reports, records of disputes & injuries)

1st Practice  
Description: ____________________________ Date: ________

2nd Practice  
Description: ____________________________ Date: ________

3rd Practice  
Description: ____________________________ Date: ________

Comments  
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Topic O: Regulatory Compliance

There are a lot of rules to follow to protect yourself and others. The business of farming involves risks in employing workers, handling large machinery, handling various chemicals, handling animal waste, generating noises and odors, food safety, and more.

Learn More

- Organic Certification Information from the USDA
- Good Agricultural Practices (GAP) Food Safety Manual by UMass Extension
- Best Management Practices (BMPs) for Environmental and Water Resources by UMass Extension
- Regulation Webinars from University of Vermont Extension
**Skill #1 Obtain scale certification**

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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**Skill #2 Provide workman’s coverage**

1st Practice
Description: ___________________________ Date: ________

2nd Practice
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3rd Practice
Description: ___________________________ Date: ________

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**Skill #3 Maintain auto insurance policies**

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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**Skill #4 Maintain pesticide applicator license**

1st Practice
Description: ___________________________ Date: ________

2nd Practice
Description: ___________________________ Date: ________

3rd Practice
Description: ___________________________ Date: ________

Comments
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Skill #5  Maintain third-party quality certifications (e.g. organic, certified naturally grown)

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

Comments
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Skill #6  Provide personal protection equipment (PPE)

1st Practice
Description: ____________________________ Date: _________

2nd Practice
Description: ____________________________ Date: _________

3rd Practice
Description: ____________________________ Date: _________

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Skill #7  Obtain food assistance certification for sales (e.g., SNAP, WIC)

1st Practice
Description: ____________________________ Date: _________

2nd Practice
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3rd Practice
Description: ____________________________ Date: _________

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Skill #8  Participate in good agricultural practice (GAP) training

1st Practice
Description: ____________________________ Date: _________

2nd Practice
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3rd Practice
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Skill #9 Follow Best Management Practices (BMPs)

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
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Growing gorgeous beets and raising the finest bacon are valuable skills. But the moment you decide to make your livelihood depend on them, they are only worthwhile if you can sell them. As a farmer you must stake out a place for your products in the marketplace. This involves analyzing what others are selling, what prices can be fetched, designing a brand for your products, promoting your farm in the public eye, growing relationships with customers, and gaining a good reputation in your community. As marketing methods have evolved from word of mouth to print to the internet, you must determine what balance is right for you.

Learn More
Marketing, Business & Risk Management Resources from the National Sustainable Agriculture Information Service
Marketing Toolshed from University of Vermont Extension
Marketing Strategies for Farmers and Ranchers by the Sustainable Agriculture Network
Small Farm Social Media by Amy Sprague
Skill #1  Conduct competitive analysis

1st Practice
Description: __________________________ Date: _________

2nd Practice
Description: __________________________ Date: _________

3rd Practice
Description: __________________________ Date: _________

Comments
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Skill #2  Develop marketing plan

1st Practice
Description: __________________________ Date: _________

2nd Practice
Description: __________________________ Date: _________

3rd Practice
Description: __________________________ Date: _________

Comments
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Skill #3  Set prices for products

1st Practice
Description: __________________________ Date: _________

2nd Practice
Description: __________________________ Date: _________

3rd Practice
Description: __________________________ Date: _________

Comments
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Skill #4  Identify customers and target market

1st Practice
Description: __________________________ Date: _________

2nd Practice
Description: __________________________ Date: _________

3rd Practice
Description: __________________________ Date: _________

Comments
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Skill #5  Develop brand and logo

1st Practice
Description: ____________________________________________    Date: _______

2nd Practice
Description: ____________________________________________    Date: _______

3rd Practice
Description: ____________________________________________    Date: _______

Comments
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Skill #6  Maintain website

1st Practice
Description: ____________________________________________    Date: _______

2nd Practice
Description: ____________________________________________    Date: _______

3rd Practice
Description: ____________________________________________    Date: _______

Comments
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Skill #7  Prepare flyers and brochures

1st Practice
Description: ____________________________________________    Date: _______

2nd Practice
Description: ____________________________________________    Date: _______

3rd Practice
Description: ____________________________________________    Date: _______

Comments
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Skill #8  Identify funding mechanisms (e.g., loans, memberships, grants)

1st Practice
Description: ____________________________________________    Date: _______

2nd Practice
Description: ____________________________________________    Date: _______

3rd Practice
Description: ____________________________________________    Date: _______

Comments
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Skill #9  Conduct outreach activities (e.g., displays, public speaking events, recipe cards)

1st Practice
Description: ______________________________________________________ Date: __________

2nd Practice
Description: ______________________________________________________ Date: __________

3rd Practice
Description: ______________________________________________________ Date: __________

Comments __________________________________________________________________________________
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Skill #10  Prepare newsletters (e.g., educational, promotional, and informational)

1st Practice
Description: ______________________________________________________ Date: __________

2nd Practice
Description: ______________________________________________________ Date: __________

3rd Practice
Description: ______________________________________________________ Date: __________

Comments __________________________________________________________________________________
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Skill #11  Maintain email/contact database

1st Practice
Description: ______________________________________________________ Date: __________

2nd Practice
Description: ______________________________________________________ Date: __________

3rd Practice
Description: ______________________________________________________ Date: __________

Comments __________________________________________________________________________________
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Skill #12  Develop promotional materials (e.g., signs, magnets)

1st Practice
Description: ______________________________________________________ Date: __________

2nd Practice
Description: ______________________________________________________ Date: __________

3rd Practice
Description: ______________________________________________________ Date: __________

Comments __________________________________________________________________________________
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Skill #13  Create social networking presence

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

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Skill #14  Provide product samples

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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Skill #15  Keep good records (e.g. customer comments, competition, price changes, sales, promotional activities)

1st Practice
Description: ________________________________ Date: ________

2nd Practice
Description: ________________________________ Date: ________

3rd Practice
Description: ________________________________ Date: ________

Comments
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At the other end of writing a farm business plan lies keeping all the gears turning once the plan has been implemented. Bills must be paid, customer feedback must be collected, and insurance must be maintained. This part of farming is decidedly less romantic, but absolutely essential. If this kind of management is not for you, consider hiring an office manager.

Learn More

Vegetable Farm Budgets and Recordkeeping: Real Examples by University of Vermont Extension
Skill #3  Develop office forms (e.g., applications, liability waivers)

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
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Skill #4  Coordinate customer billing

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
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Skill #5  Process invoices

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

Comments
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Skill #6  Prepare bank deposit

1st Practice
Description: ____________________________ Date: ________

2nd Practice
Description: ____________________________ Date: ________

3rd Practice
Description: ____________________________ Date: ________

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○ Skill #7  Balance checkbook

1st Practice
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2nd Practice
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3rd Practice
Description: ________________________________________________________ Date: __________

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○ Skill #8  Process payroll

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2nd Practice
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3rd Practice
Description: ________________________________________________________ Date: __________

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○ Skill #9  Process reimbursements

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2nd Practice
Description: ________________________________________________________ Date: __________

3rd Practice
Description: ________________________________________________________ Date: __________

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○ Skill #10  Analyze customer surveys and feedback

1st Practice
Description: ________________________________________________________ Date: __________

2nd Practice
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3rd Practice
Description: ________________________________________________________ Date: __________

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Skill #11  Maintain computers (hardware, software)

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2nd Practice
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3rd Practice
Description: ________________________________________________________  Date: __________

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Skill #12  Maintain insurance policies

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Description: ________________________________________________________  Date: __________

3rd Practice
Description: ________________________________________________________  Date: __________

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Skill #13  Maintain operating budget

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2nd Practice
Description: ________________________________________________________  Date: __________

3rd Practice
Description: ________________________________________________________  Date: __________

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Topic Q: Farm Administration
**Skill #1** Obtain basic knowledge of plant, soil, and animal sciences, ecology, meteorology, business, finance, and accounting

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<tr>
<th>Practice</th>
<th>Description</th>
<th>Date</th>
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**Comments**

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**Skill #2** Find a farmer-mentor

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<tr>
<th>Practice</th>
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**Comments**

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A farmer is never done learning. You can stay keen by continually engaging in conversations with other agricultural professionals; maintaining a mentor relationship with someone; reading books, periodicals, blogs, and scientific studies; attending workshops, field days, and conferences; and in some way recording your own experiences. Methods, practices, and opinions change frequently in agriculture.

**Learn More**

- Sustainable Agriculture Research and Education (SARE)
- National Sustainable Agriculture Information Service (ATTRA)
- Ecological Farming Association (EcoFarm)
- Northeast Organic Farming Association (NOFA)
- Pennsylvania Association for Sustainable Agriculture (PASA)
- Midwest Organic and Sustainable Education Service (MOSES)
Skill #3  Observe your farm daily

1st Practice
Description: ______________________________________ Date: _________

2nd Practice
Description: ______________________________________ Date: _________

3rd Practice
Description: ______________________________________ Date: _________

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Skill #4  Keep a farm journal

1st Practice
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2nd Practice
Description: ______________________________________ Date: _________

3rd Practice
Description: ______________________________________ Date: _________

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Skill #5  Read agricultural literature (e.g. books, journals, catalogs)

1st Practice
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2nd Practice
Description: ______________________________________ Date: _________

3rd Practice
Description: ______________________________________ Date: _________

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Skill #6  Visit other farms

1st Practice
Description: ______________________________________ Date: _________

2nd Practice
Description: ______________________________________ Date: _________

3rd Practice
Description: ______________________________________ Date: _________

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Topic R: Professional Development
Skill #7 Establish relationships with local institutions and organizations

1st Practice
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2nd Practice
Description: __________________________________________________________ Date: __________

3rd Practice
Description: __________________________________________________________ Date: __________

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Skill #8 Attend classes, conferences, workshops and tradeshows

1st Practice
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2nd Practice
Description: __________________________________________________________ Date: __________

3rd Practice
Description: __________________________________________________________ Date: __________

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Skill #9 Consult with local experts (e.g. extension agents)

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2nd Practice
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3rd Practice
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Skill #10 Dialogue with customers

1st Practice
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2nd Practice
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3rd Practice
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Topic S
Practicing Conservation

This Workbook examines all aspects of farming through a lens of environmental, economic, and social sustainability. But it is worth it, at the end, to look back upon each skill and ask, “How have I applied the theories and practices of conservation to this task or idea?”

Learn More
Natural Resource Conservation Service of the USDA (NRCS)

Skill #11 Keep posted on current events and trends

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2nd Practice
Description:  ____________________________ Date:  ________

3rd Practice
Description:  ____________________________ Date:  ________

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Skill #11 Learn from experience (e.g. frequently compare actual outcomes to farm plan and adjust day-to-day operations accordingly)

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2nd Practice
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3rd Practice
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Skill #1  Prepare conservation and land use plan (e.g. research programs and regulations; timeline and budgets for: infrastructure development, conservation practices, irrigation/water projects; update maps)

1st Practice
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2nd Practice
Description: ___________________________ Date: __________

3rd Practice
Description: ___________________________ Date: __________

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Skill #2  Implement conservation practices and measures (e.g. crop residue, conservation tillage, buffer strips, field borders, wildlife habitat improvement, waterway protection)

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Description: ___________________________ Date: __________

3rd Practice
Description: ___________________________ Date: __________

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Skill #3  Build soil health, structure, and productivity

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3rd Practice
Description: ___________________________ Date: __________

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Skill #4  Prevent soil and nutrient loss

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2nd Practice
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3rd Practice
Description: ___________________________ Date: __________

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<table>
<thead>
<tr>
<th>Skill #5 Monitor weather and climate</th>
<th>Skill #7 Manage crop and livestock rotations</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>1st Practice</td>
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<td>Comments</td>
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<table>
<thead>
<tr>
<th>Skill #6 Manage pests and diseases</th>
<th>Skill #8 Conduct trials of new animal breeds, crop varieties, products, and techniques</th>
</tr>
</thead>
<tbody>
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<td>1st Practice</td>
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Topic S: Practicing Conservation
○ **Skill #9**  **Irrigate for conservation**

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2nd Practice
Description: _______________________________ Date: __________

3rd Practice
Description: _______________________________ Date: __________

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○ **Skill #10**  **Examine whole-farm system from an ecological perspective**

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2nd Practice
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3rd Practice
Description: _______________________________ Date: __________

Comments
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## Appendix I

### Qualification Table

<table>
<thead>
<tr>
<th>Topic</th>
<th>Skill</th>
<th>Date Qualified</th>
<th>Supervisor Initials</th>
<th>Trainee Initials</th>
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</thead>
<tbody>
<tr>
<td><strong>A</strong> Defining Principles</td>
<td>#1: Define sustainable agriculture</td>
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<td></td>
<td>#2: Define personal and professional values</td>
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<td>#3: Define personal and professional mission</td>
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<td>#4: Set short- and long-term farming goals</td>
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<td>#5: Establish physical, mental, and emotional health and safety guidelines</td>
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<td>#6: Identify action steps for moving toward goals while staying true to values and guidelines</td>
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<tr>
<td><strong>B</strong> Farm Business Planning</td>
<td>#1: Assess overall needs</td>
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<td>#2: Assess available resources</td>
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<td>#3: Conduct market research and competitive analysis</td>
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<td>#4: Prepare enterprise budgets and select enterprise(s)</td>
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<td>#5: Prepare financial plan</td>
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<td>#6: Secure access to land</td>
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<td>#7: Assess site</td>
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<td>#8: Research legal requirements</td>
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<td>#9: Determine management style</td>
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<td>#10: Assemble whole farm business plan</td>
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<td><strong>C</strong> Setting Up Your Business</td>
<td>#1: Obtain necessary financing</td>
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<td></td>
<td>#2: Establish farm legal structure</td>
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<td>#3: Establish farm management team</td>
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<td>#4: Establish farm policies</td>
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<td>#5: Obtain necessary licenses, permits, and certifications</td>
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<td>#6: Open business bank account</td>
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<td>#7: Purchase liability and property insurance</td>
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<td>#8: Establish credit with key suppliers</td>
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<td>#9: Obtain necessary office equipment and supplies</td>
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<td>#10: Set up bookkeeping system</td>
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<td>#11: Set up filing and record-keeping systems</td>
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<td>#12: Provide for farm family security</td>
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<tr>
<td><strong>D</strong> Maintaining Equipment &amp; Facilities</td>
<td>#1: Inspect production equipment and facilities</td>
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<td>#2: Adhere to federal, state, and local legal and regulatory requirements</td>
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<td>#3: Build/install infrastructure</td>
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<td>#4: Create farm signage</td>
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<td>#5: Establish preventive maintenance schedule for infrastructure</td>
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<td>#6: Establish parts and supplies inventory</td>
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<td>#7: Repair production facilities</td>
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<td>#8: Repair production equipment</td>
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<td>#9: Upgrade inefficient equipment</td>
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<td>#10: Acquire necessary tools, equipment, and supplies</td>
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<td>#11: Calibrate production equipment</td>
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<td>#12: Perform routine equipment service</td>
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<td>#13: Clean production equipment</td>
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<td>#14: Clean harvest containers</td>
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<td>#15: Calibrate product scales</td>
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<td>#16: Store tools, equipment and supplies</td>
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<td><strong>E</strong> Seasonal Crop Production Planning</td>
<td>#1: Review past production records</td>
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<td>#2: Develop crop plan with other farmers</td>
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<td>#3: Establish crop planting schedule and record keeping system</td>
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<td>#4: Design field layout</td>
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<td>#5: Establish multi-year crop rotation plan</td>
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<td>#6: Select plant varieties</td>
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<td>#7: Review pest and weed management options</td>
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<td>#8: Order field supplies</td>
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<td>#9: Plan for seed breeding and saving</td>
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<td><strong>F</strong> Soil Maintenance</td>
<td>#1: Understand the physical, biological, and chemical properties of soil</td>
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<td>#2: Prepare soil samples for testing</td>
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<td>#3: Read and interpret soil test results</td>
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<td>#4: Classify soil texture and type</td>
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<td>#5: Develop fertility program and record keeping system</td>
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<td></td>
<td>#6: Select and acquire cover crop varieties</td>
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<td>#7: Select and acquire soil amendments</td>
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<td>#8: Build and maintain certified compost piles</td>
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<tr>
<td>Topic</td>
<td>Skill</td>
<td>Date Qualified</td>
<td>Supervisor Initials</td>
<td>Trainee Initials</td>
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<tr>
<td>Soil Maintenance, continued</td>
<td>#9: Manage soil pH</td>
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<td>#10: Implement ongoing fertility management</td>
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<td>#11: Manage cover crop in fields</td>
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<td>#12: Assess appropriate soil moisture levels for tillage</td>
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<td>#13: Lay out beds</td>
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<td>#14: Understand the basic functions, safety features, and operations of a tractor and its implements</td>
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<td>#15: Hitch implements and drive tractor</td>
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<td>#16: Do primary tillage</td>
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<td>#17: Do secondary tillage</td>
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<td></td>
<td>#18: Shape beds</td>
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<tr>
<td>Propagation</td>
<td>#1: Learn about different types of propagation facilities</td>
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<td></td>
<td>#2: Develop greenhouse seeding calendar and schedule</td>
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<td>#3: Develop labeling system</td>
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<td>#4: Prepare propagation medium mixes</td>
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<td>#5: Acquire appropriate growing containers</td>
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<td>#6: Start seeds in containers</td>
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<td>#7: Direct sow into fields</td>
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<td>#8: Plant bulbs/tubers</td>
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<td>#9: Take cuttings for asexual propagation</td>
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<td>#10: Root or graft cuttings</td>
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<td>#11: Monitor seedling development</td>
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<td>#12: Maintain seedlings (e.g., moisture, temperature, fertility, thinning, potting up, pests, hardening off)</td>
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<td>#13: Manage propagation facility</td>
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<td>#14: Acquire transplants</td>
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<td>#15: Plant transplants in field</td>
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<td>Irrigation</td>
<td>#1: Recognize signs and effects of water stress</td>
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<td>#2: Assess soil moisture and irrigation needs in plant beds</td>
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<td>#3: Consider costs and benefits of different irrigation systems</td>
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<td>#4: Acquire and set up irrigation system</td>
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<td>#5: Maintain water quality</td>
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<td>#6: Determine irrigation needs and create schedule</td>
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<td>#7: Keep good records of irrigation activity</td>
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<td>Maintaining Crop Health</td>
<td>#1: Replant or reseed failed plants</td>
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<td>#2: Practice manual and mechanical cultivation methods</td>
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<td>#3: Identify and remove weeds</td>
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<td>#4: Apply appropriate fertilizers</td>
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<td>#5: Hill crops</td>
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<td>#6: Thin crops</td>
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<td>#7: Assess fertility requirements</td>
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<td>#8: Mulch crops</td>
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<td>#9: Construct and install supports</td>
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<td>#10: Prune plants</td>
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<td>#11: Train plants</td>
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<td>#12: Tip plants</td>
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<td>#13: Provide supplemental pollination</td>
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<td>#14: Adhere to federal, state, and local regulations</td>
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<td>Dealing With Environmental Variables</td>
<td>#1: Monitor growing environment</td>
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<td>#2: Check weather forecast and create daily/weekly response plan</td>
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<td>#3: Scout for pests</td>
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<td>#4: Evaluate pest damage</td>
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<td>#5: Determine protective measures for crops</td>
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<td>#6: Apply row covers</td>
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<td>#7: Install protective structures</td>
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<td>#8: Install rodent traps</td>
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<td>#9: Apply pesticides</td>
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<td>#10: Release beneficial insects</td>
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<td>#11: Apply frost protection measures</td>
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<td>#12: Install high/low tunnels</td>
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<td>#13: Identify and implement season extension methods</td>
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<td>Managing the Harvest</td>
<td>#1: Determine crop maturity</td>
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<td>#2: Understand the requirements and implications of food safety</td>
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<td>#3: Determine harvest requirements</td>
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<td>#4: Provide harvest aids</td>
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<td>#5: Hand-harvest crops</td>
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<td>#6: Provide sun protection to harvested crops</td>
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<td>#7: Field pack crops</td>
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<td><strong>K</strong> Managing the Harvest, continued</td>
<td>#8: Rinse harvested crops</td>
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<td>#9: Grade harvested produce</td>
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<td>#10: Bunch harvested produce</td>
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<td>#11: Maintain harvest records</td>
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<td>#12: Pre-cool harvested produce</td>
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<td>#16: Slaughter meat animals</td>
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<td>#17: Perform post-harvest handling and processing tasks</td>
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<td>#18: Add value to animal products if required by marketing plan</td>
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<td><strong>L</strong> Raising Livestock</td>
<td>#7: Deliver products</td>
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<td>#8: Maintain return inventory</td>
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<td><strong>M</strong> Getting Your Product to Market</td>
<td>#1: Develop marketing plan</td>
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<td>#3: Set prices for products</td>
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<td>#4: Identify customers and target market</td>
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<td>#1: Determine packing order</td>
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<td>#2: Pack product</td>
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<td>#3: Cold store product prior to delivery</td>
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<td>#4: Establish delivery times and pickup points</td>
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<td>#5: Load products</td>
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<td>#6: Plan delivery route</td>
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<td>P Marketing, continued</td>
<td>#5: Develop brand and logo</td>
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<td>#6: Maintain website</td>
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<td>#7: Prepare flyers and brochures</td>
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<td>#8: Identify funding mechanisms</td>
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<td>#9: Conduct outreach activities</td>
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<td>#10: Prepare newsletters</td>
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<td>#11: Maintain email/contact database</td>
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<td>#12: Develop promotional materials</td>
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<td>#13: Create social networking presence</td>
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<td>#14: Provide product samples</td>
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<td>Q Farm Administration</td>
<td>#1: Update product listing and prices</td>
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<td>#2: Update packing and delivery order</td>
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<td>#3: Develop office forms</td>
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<td>#9: Process reimbursements</td>
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<td>#10: Analyze customer surveys and feedback</td>
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<td>#11: Maintain computers</td>
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<td>R Professional Development</td>
<td>#1: Obtain basic knowledge of plant, soil, and animal sciences, ecology, meteorology, business, finance, and accounting</td>
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<td>#2: Find a farmer-mentor</td>
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<td>#3: Observe your farm daily</td>
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<td>#5: Read agricultural literature</td>
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<td>#7: Establish relationships with local institutions and organizations</td>
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<td>#8: Attend classes, conferences, workshops, and tradeshows</td>
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<td>#9: Consult with local experts</td>
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<td>#10: Dialogue with customers</td>
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<td>#11: Keep posted on current events and trends</td>
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<td>#12: Learn from experience</td>
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<td>S Practicing Conservation</td>
<td>#1: Prepare conservation and land use plan</td>
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<td>#2: Implement conservation practices and measures</td>
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<td>#3: Build soil health, structure, and productivity</td>
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<td>#4: Prevent soil and nutrient loss</td>
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<td>#5: Monitor weather and climate</td>
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<td>#6: Manage pests and diseases</td>
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<td>#7: Manage crop and livestock rotations</td>
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<td>#8: Conduct trials of new animal breeds, crop varieties, products, and techniques</td>
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<td>#9: Irrigate for conservation</td>
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<td>#10: Examine whole-farm system from an ecological perspective</td>
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Appendix II
Learning Contract Template

Apprenticeship Learning Contract

Start Date: ______________
End Date: ________________

Farm
• Name: ___________________________________________________________
• Address: _________________________________________________________
• Phone Number: ____________________________________________________

Trainee
• Name: ___________________________________________________________
• Role on Farm: _____________________________________________________
• Home Address: ____________________________________________________
• Phone Number: ____________________________________________________
• Email Address: _____________________________________________________

Trainer
• Name: ___________________________________________________________
• Role on Farm: _____________________________________________________
• Home Address: ____________________________________________________
• Phone Number: ____________________________________________________
• Email Address: _____________________________________________________

Shared Learning Objectives (to be completed together by the Trainee and Trainer)
1. 
2. 
3. 
4. 
5.

Trainee's Educational Goals for Self
1. 
2. 
3. 
4. 
5.

Trainee's Responsibilities to Trainer
1. 
2. 
3. 
4. 
5.

Trainer's Educational Goals for Trainee
1. 
2. 
3. 
4. 
5.

Trainer's Responsibilities to Trainee
1. 
2. 
3. 
4. 
5.

Signatures
Trainee Signature: ___________________________ Date: ____________

Trainer Signature: ___________________________ Date: ____________