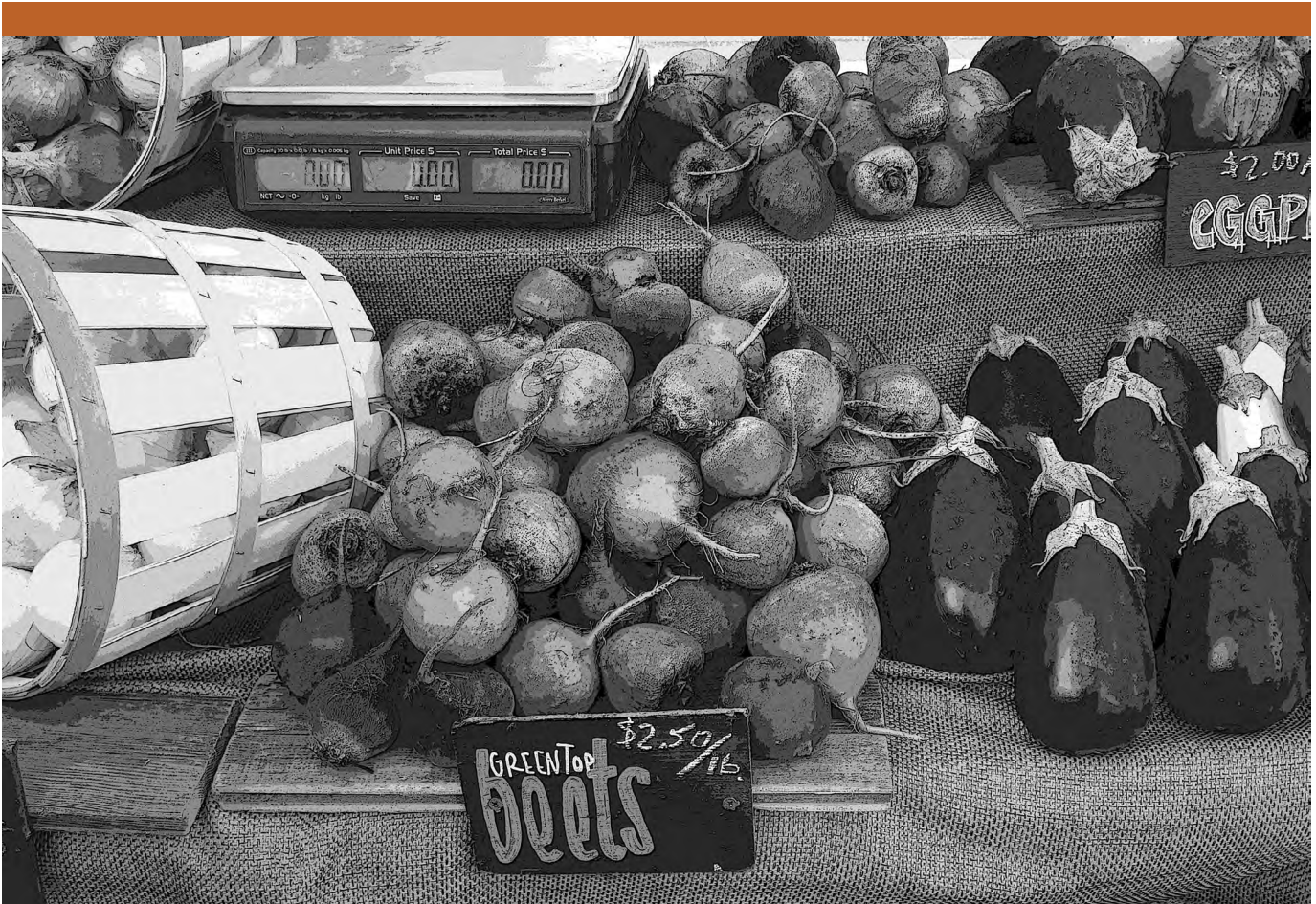




A Resource Guide for **BEGINNING FARMERS**

**An informational resource manual for
beginning and aspiring Iowa farmers.**

The curriculum in this manual is divided into three parts: production practices, post-harvest handling, and business planning/basic finances. Each module is organized by learning objectives and includes narrative, hands-on activities, and links to worksheets and additional resources.



A Reference Guide for BEGINNING FARMERS

What is the purpose of this publication?

The idea for this curriculum for beginning farmers came from the increasing interest in establishing incubator farms throughout Iowa. As outreach staff at a land-grant university, our role is to assist in creating educational materials for use by these training farms. Iowa State University offers a wealth of information on farming practices and strategies; this publication is a compilation of existing resources into a complete curriculum.

This guide provides useful modules for people who want to start farming. The structure was chosen after reviewing curricula from over a dozen incubators and other farm training programs from across the country. Most topics are geared toward fruit and vegetable growers and additional modules may be added depending on user interest on topics such as livestock management.

Acknowledgements

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The publication was prepared by Alice Topaloff, with support from Iowa State University Extension and Outreach Local Foods Team and the Leopold Center for Sustainable Agriculture. For more information or suggestions for additional publications, contact Alice at topaloff@iastate.edu.

Cover photos by romrodinka/iStock.com, Jupiterimages/Creatas.com, and Ajay Nair. Inside front and back cover photos by Jane Lenahan.

Who is this publication for?

People interested in hosting a farmer training program (incubator or other) will find the resources in this publication useful to teach a Beginning Farmer Training program.

A beginning farmer will find this publication as a useful guide to locating existing resources. This curriculum presents an overview of what other beginning farmer training programs offer and where to find the appropriate information.

What is an incubator farm?

Among the main barriers to starting a farm business are lack of capital (land, equipment, inputs) and experience (formal training, hands-on experience). Farm incubators offer a way to overcome both barriers. These multi-farmer operations allow each farmer to rent a small plot. The rent includes access to land, training and technical guidance (from service providers, established farmers, or on-farm staff), as well as marketing assistance. At the end of the “course” (usually a 3- to 5-year period), the farmer should be able to transition to a plot of his/her own, having acquired the skills, knowledge and expertise necessary to start farming successfully.

How is this curriculum structured?

The curriculum is divided into three modules:

1. Production practices,
2. Harvest and post-harvest handling, and
3. Business planning and basic finances.

Each module is organized by learning objectives, and includes narrative, hands-on activities, when applicable, as well as links to worksheets and additional resources.

Additional resources

Appendix I: Other sources

Appendix II: Organizations and programs that support beginning farmers

Appendix III: List of contacts

TABLE of CONTENTS

TOPIC A: Production	9
Modules.....	9
Additional resources.....	9
Module 1: Soil	10
Narrative.....	10
Hands-on activity.....	10
Worksheet.....	10
Additional resources.....	10
Module 2: Composting	11
Narrative.....	11
Hands-on activity.....	11
Worksheet.....	11
Additional resources.....	11
Module 3: Basic plant biology and nutrient management	12
Narrative.....	12
Worksheet.....	12
Additional resources.....	12
Module 4: Irrigation	13
Narrative.....	13
Hands-on activity.....	13
Worksheet.....	13
Additional resources.....	13
Module 5: Field preparation and planting	14
Narrative.....	14
Hands-on activity.....	14
Worksheet.....	14
Additional resources.....	14
Module 6: Insect control/entomology	15
Narrative.....	15
Hands-on activity.....	15
Additional resources.....	15
Module 7: Weed management	16
Narrative.....	16
Hands-on activity.....	16
Worksheet.....	16
Additional resources.....	16

TABLE of CONTENTS (continued)

Module 8: Disease control and plant pathology	17
Narrative.....	17
Hands-on activity.....	17
Additional resources.....	17
Module 9: Season extension	18
Narrative.....	18
Additional resources.....	18
Module 10: Cover Cropping	19
Narrative.....	19
Worksheet.....	19
Additional resources.....	19
Module 11: Small farm equipment	20
Narrative.....	20
Hands-on activity.....	20
Additional resources.....	20
Module 12: Whole farm design and management	21
Narrative.....	21
Hands-on activity.....	21
Worksheet.....	21
Additional resources.....	21
TOPIC B: Post-harvest handling	22
Useful resources.....	22
Modules.....	22
Module 1: Harvesting and post-harvest handling	23
Narrative.....	23
Hands-on activity.....	23
Additional resources.....	23
Module 2: Food safety	24
Narrative.....	24
Worksheet.....	24
Additional resources.....	24
Module 3: Seed saving	25
Narrative.....	25
Hands-on activity.....	25
Worksheet.....	25
Additional resources.....	25

TOPIC C: Business planning and basic farm finances	26
Recommended resources	26
Modules	26
Module 1: Starting out with financial management	27
Narrative	27
Worksheet	27
Additional resources	27
Module 2: Writing a business plan (1/3) – Farm history and current situation: what do you have to work with?	28
Narrative	28
Worksheet	28
Module 3: Writing a business plan (2/3) – Vision, mission and goals: where do you want to go?	29
Narrative	29
Worksheet	29
Additional resources	29
Module 4: Writing a business plan (3/3) – Strategic planning and evaluation: what routes will take you where you want to go?	30
Narrative	30
Worksheet	30
Additional resources	30
Module 5: Farm data collection and organization	31
Narrative	31
Worksheet	31
Additional resources	31
Module 6: Organizing basic financial information	32
Narrative	32
Worksheet	32
Additional resources	32
Module 7: Financing from loan providers and federal agencies	33
Narrative	33
Additional resources	33

TABLE of CONTENTS (continued)

List of references	34
Appendix I: Other sources	42
Farm Service Agency—Financial assistance for farmers.....	42
FSPU—A food safety plan for you.....	42
Business plan: Values, vision, mission and goals.....	42
Identifying human resource needs in a business.....	42
Appendix II: Organizations and program that support beginning farmers	43
1A. Formal training in academia.....	43
1B. Online courses and webinars.....	43
2A. Gaining practical experience.....	44
2B. Try it out!.....	44
3A. Build a business plan—Courses.....	44
3B. Build a business plan—Resources.....	45
4A. Access to capital.....	45
4B. Access to land.....	45
Appendix III: List of contacts	46

TOPIC A: Production

The objective of this section is to give the trainee a general overview of production practices, from basic plant biology to managing soil fertility and growing successful crops. The ultimate goal is for the beginning farmer to have all the tools necessary to create a holistic and logical “Whole Farm Plan.”

Modules

Module 1: Soil

Module 2: Composting

Module 3: Basic plant biology and nutrient management

Module 4: Irrigation systems

Module 5: Field preparation and planting

Module 6: Insect control and entomology

Module 7: Weed management

Module 8: Disease control and plant pathology

Module 9: Season extension

Module 10: Cover cropping

Module 11: Small farm equipment

Module 12: Whole farm planning

Additional resources

Growing Organic Vegetables in Iowa, ISU Extension and Outreach, includes strategies for composting, fertility management, pest management, and disease management.

store.extension.iastate.edu/Product/Growing-Organic-Vegetables-in-Iowa

Midwest Vegetable Production Guide for Commercial Growers is used as a reference by many commercial-scale vegetable growers, and combines resources from seven Midwest land-grant universities.

www.btny.purdue.edu/Pubs/ID/id-56/

CONTENT and OUTCOME

- › Soil science and biology
- › Soil testing
- › Soil management and health
- › History of the plot

CONTACT

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MODULE 1: Soil

Narrative

Soil Management Basics, New Farms for New Americans. This simple presentation covers the basics of soil management, including soil fertility, management practices, pests and diseases, and information on organic versus conventional agriculture.

<http://nesfp.nutrition.tufts.edu/resources/organic-production-and-soil-management>

Hands-on activity

General field observations:

- Nutrient deficiency symptoms: Do crops show signs of stress or stunted growth during wet or dry periods?
- Is the soil compacted? Does it plow up cloddy and take a lot of secondary tillage to prepare a fine seedbed?
- Does the soil crust over easily, or are there signs of runoff and erosion?

Test a soil sample using methods learned (see page 274 in SARE's publication* on soils for examples). Discuss how it can be improved (see page 286 in SARE's publication* on soils for examples).

Worksheet

- **Garden Soil Management**, Henry Taber, ISU Extension and Outreach. To manage soil more effectively, learn about tillage, integrating organic matter, soil testing and pH, fertilizer application and more.
store.extension.iastate.edu/Product/Garden-Soil-Management

Additional resources

- **Building Soils for Better Crops, 3rd edition**, SARE*. A reference on ecological soil management. It provides step-by-step information on soil-improving practices as well as in-depth background ranging from what soil is to organic matter.
www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition
- **Soil and Land Use**, ISU Extension and Outreach. Contains data on Iowa's soil. www.extension.iastate.edu/soils
- **Soil Sample Information Sheet for Horticulture Crops**, ISU Extension and Outreach. Download this publication to submit soil samples for analysis at the ISU Soil Plant Analysis Laboratory.
store.extension.iastate.edu/Product/Soil-sample-information-sheet-for-horticulture-crops
- **Soil Quality in Organic Agricultural Systems**, Kathleen Delate, ISU Extension and Outreach. Covers all topics from crop rotation to amendments. store.extension.iastate.edu/Product/Soil-Quality-in-Organic-Agricultural-Systems

MODULE 2: Composting

Narrative

Kansas State University Extension video series:

1. Composting: Making Black Gold. Watch this 4-minute video to learn the basics of composting.
www.youtube.com/watch?v=t44o4tsgo_k
2. Composting: Troubleshooting Issues.
www.youtube.com/watch?v=P1b7F92YzXk

Hands-on activity

Create your own compost.

Worksheet

- **Questions About Composting**, Linda Naeve and Richard Jauron, ISU Extension and Outreach. This publication answers some commonly asked questions about composting.
store.extension.iastate.edu/Product/Questions-About-Composting-Reiman-Gardens

Additional resources

- **Composting – A Beginner’s Guide**, The Robert A. Macoskey Center for Sustainable Education and Research at Slippery Rock University of Pennsylvania.
academics.sru.edu/MacoskeyCenter/Publications/Composting_Booklet.pdf
This publication serves as a resource on composting for many incubators, including GoFarm Hawaii.
www.gofarmhawaii.org

CONTENT and OUTCOME

- › **Building and maintaining compost**
- › **How/why/when to use it**

CONTACT

ISU Extension and Outreach ‘Hotline’
<https://expert-hort.sws.iastate.edu>

Iowa Master Gardener Program
www.mastergardener.iastate.edu

CONTENT and OUTCOME

- › How a plant functions and what it needs
- › Inputs and products of photosynthesis
- › Vegetable families
- › Planting calendar
- › Introduction to crop rotation

CONTACT

Iowa Master Gardener Program
www.mastergardener.iastate.edu

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MODULE 3: Basic plant biology and nutrient management

Narrative

Master Gardener Online Short Course Series, Oregon State University. Register for the highly interactive online botany course free of charge.
pace.oregonstate.edu/catalog/master-gardener-online-short-course-series

The Wisconsin Master Gardener Program – Botany session, University of Wisconsin Extension. This online course is recommended by The Iowa Master Gardener Program's leaders.
wimastergardener.org/?q=session1

Worksheet

- **The Organic Way-Plant Families**, Virginia Cooperative Extension. Producers should be knowledgeable about vegetable families as each one has its own cultural requirements, pollinating vectors and, most importantly, effective crop rotation plans. Here is a detailed table of vegetables. pubs.ext.vt.edu/2906/2906-1393/2906-1393.html
- **Planting and Harvesting Times for Garden Vegetables**, Richard Jauron, ISU Extension and Outreach. This guide can help northern, southern, and central Iowa vegetable growers schedule their plantings so space is used efficiently. Includes a staggered planting and harvesting chart for crops grown April through October.
store.extension.iastate.edu/Product/Planting-and-Harvesting-Times-for-Garden-Vegetables

Additional resources

- **Growing Organic Vegetables in Iowa**, Kathleen Delate, ISU Extension and Outreach. Covers all topics related to organic vegetable production, including nutrient management.
store.extension.iastate.edu/Product/Growing-Organic-Vegetables-in-Iowa
- **Nutrient Management for Commercial Fruit and Vegetable Crops** in Minnesota, University of Minnesota Extension. Recommendations for fertilizing fruit and vegetable crops should be based in part on soil test results. This bulletin gives fertilizer recommendations for efficient nutrient management.
www.extension.umn.edu/garden/fruit-vegetable/nutrient-management-for-commercial-fruit-and-vegetables-in-mn/
- **Basic Botany, Kentucky Master Gardener Manual Chapter 1**, Cooperative Extension Service, University of Kentucky College of Agriculture. Available for download.
www2.ca.uky.edu/agc/pubs/ho/ho96/ho96.pdf

MODULE 4: Irrigation

Narrative

Low-Cost Irrigation System, Natural Resources Conservation Service (NRCS). This document offers small-scale irrigation solutions (sprinkler and drip) for your farm.

www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1167473.pdf

Small Farm's Irrigation Management Basics, Oregon State University. This document offers more detailed information.

smallfarms.oregonstate.edu/sfn/sp10IrrigationManagement

Hands-on activity

Assess water needs on a plot.

Set up drip tape or other irrigation system.

Worksheet

- **Drip Irrigation Calculator**, ISU Extension and Outreach Iowa Produce website. Found under “Production – Irrigation Calculator”. This spreadsheet will help calculate how many gallons of water to apply with drip irrigation. (For your information, this opens directly into an Excel sheet.)

www.iowaproduce.org/drip-irrigation-calculators

Additional resources

- **Irrigation Scheduling and Tensiometer Tips for Trickle Irrigation**, ISU Extension and Outreach - Iowa Produce website. Found under “Production – Irrigation Scheduling and Tensiometer Tips”.
- **ISU Extension and Outreach Agricultural Engineering specialists** are available as a resource. Since there is very limited field irrigation acreage in Iowa, ISU Extension and Outreach ag engineers are not heavily involved in this area. However, these specialists can provide helpful advice on irrigating a small area for food crops.

www.extension.iastate.edu/ag/engineering

CONTENT and OUTCOME

- › Different irrigation systems (drip, sprinkler, etc.)
- › Determining water needs and proper irrigation

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CONTENT and OUTCOME

- › What plants should you grow?
- › Direct seeding
- › Transplanting
- › Equipment considerations (size, depth)

CONTACT

ISU Extension and Outreach 'Hortline'
<https://expert-hort.sws.iastate.edu>

Iowa Master Gardener Program
www.mastergardener.iastate.edu

MODULE 5: Field preparation and planting

Narrative

What plants can you grow?

Hands-on activity

Gain experience with starting seeds, direct seeding, and transplanting.

Worksheet

- **How to Plant Vegetables**, New Entry Sustainable Farming Project. This 2-page sheet gives simple directions and visuals to help you plant different types of vegetables.*¹
nesfp.nutrition.tufts.edu/sites/default/files/resources/spreadsheet_of_how_to_plant_vegetable_crops_-_june.pdf
- **Transplant Production Decision Tool**, Leopold Center for Sustainable Agriculture. The equipment and supplies used in producing transplants can affect the profitability of the transplant production enterprise. Chris Blanchard's tool provides information and options to farmers in the upper Midwest about the choices available as they scale up.
www.leopold.iastate.edu/cool_tools/transplant-production-decision-tool

Additional resources

- **Planting a Home Vegetable Garden**, ISU Extension and Outreach
store.extension.iastate.edu/Product/Planting-a-Home-Vegetable-Garden
- **Popular Iowa Cultivars**, ISU Extension and Outreach
 - **Fruit Cultivars for Iowa**, Paul Domoto.
store.extension.iastate.edu/Product/Fruit-Cultivars-for-Iowa
 - **Cole Crops**, Cynthia Haynes, Eldon Evergart, and Richard Jauron.
store.extension.iastate.edu/Product/Cole-Crops
 - **Potatoes**, Richard Jauron.
store.extension.iastate.edu/Product/Potatoes
- **Recommended Tomato Varieties for Commercial Production in Iowa**, Ajay Nair.
store.extension.iastate.edu/Product/Recommended-Tomato-Varieties-for-Commercial-Production-in-Iowa
- **Planting and harvesting times for garden vegetables**, Richard Jauron.
store.extension.iastate.edu/Product/Planting-and-Harvesting-Times-for-Garden-Vegetables

¹ Check out the *New Entry Sustainable Farming Project's National Incubator Farm Training Initiative* website for a wide range of resources to help beginning farmers, <http://nesfp.org/food-systems/national-incubator-farm-training-initiative/training-materials>.

MODULE 6: Insect control/ entomology

Narrative

Biointensive Integrated Pest Management, National Sustainable Agriculture Information Service, managed by National Center for Appropriate Technology (NCAT). Provides the rationale for biointensive integrated pest management (IPM), outlines the concepts and tools, and suggests steps and resources for implementing IPM. Although it was published in 2001, most of the links and appendices remain relevant. attra.ncat.org/attra-pub/summaries/summary.php?pub=146

Radcliffe's IPM World Textbook, University of Minnesota. A comprehensive electronic textbook of IPM, featuring chapters contributed by internationally-recognized experts. ipmworld.umn.edu

Organic IPM Field Guide, National Sustainable Agriculture Information Service, managed by NCAT. A pictorial guide to the concepts of organic IPM and important pests and benefits. The publication was compiled from a series of presentations that were part of an organic pest management training course hosted by ALBA, a California-based farm incubator. attra.ncat.org/attra-pub/summaries/summary.php?pub=148

Hands-on activity

Pest identification.

Formulate a basic pest management plan.

Additional resources

- **Pesticide Safety Education Program website**, ISU Extension and Outreach. This website provides a list of IPM resources and training activities. www.extension.iastate.edu/pme/IPM.html
- **Plant and Insect Diagnostic Clinic**, Iowa State University. This website contains a list of insects and their specific characteristics; description, photograph, life cycle, damage and management. www.ipm.iastate.edu/ipm/info/insects
- **Integrated Pest Management (IPM) Principles website**, U.S. Environmental Protection Agency. www.epa.gov/opp00001/factsheets/ipm.htm
- **VegEdge website**, University of Minnesota. IPM resources. www.vegedge.umn.edu/intro/ipmother.htm

CONTENT and OUTCOME

- › Basics of Integrated Pest Management (IPM)
- › Identification
- › Learning
- › Monitoring
- › Action threshold
- › Management tactics
- › Evaluation of results

CONTACT

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CONTENT and OUTCOME

- › Identifying weeds
- › Weed pressure management strategies

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MODULE 7: Weed management

Narrative

Sustainable Weed Management for Small and Medium-Scale Farms, National Sustainable Agriculture Information Service, managed by NCAT. This publication discusses several strategies, both proactive and reactive, for managing croplands as alternatives to conventional tillage systems. attra.ncat.org/attra-pub/summaries/summary.php?pub=479

Hands-on activity

Walk through a plot. Identify weeds and discuss how to manage them.

Worksheet

- ***Weeds—Your Management Strategy***, NRCS, Oregon. A step-by-step interactive guide to safe and effective weed control. www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_039960.pdf

Additional resources

- ***Weed Management for Organic Farmers***, Kathleen Delate, ISU Extension and Outreach. This publication discusses a wide variety of tools and strategies to control weeds without using synthetic chemicals. store.extension.iastate.edu/Product/Weed-Management-for-Organic-Farmers
- ***Weed Management in the Home Garden***, Richard Jauron, ISU Extension and Outreach, explains three methods of weed control used for small-scale vegetable production, including mulch. store.extension.iastate.edu/Product/Weed-Management-in-the-Home-Garden

MODULE 8: Disease control and plant pathology

Narrative

Western Sustainable Agriculture Research & Education Farm Internship Curriculum, Oregon State University Extension, 2007², contains information about plant pathogens. attra.ncat.org/intern_handbook/pathogens.html

Disease Management Tactics for Vegetables, Michigan State University Extension website. This posting reviews the principles of integrated disease management, and lists additional resources to help put together a disease management plan. msue.anr.msu.edu/news/disease_management_tactics_for_vegetables_webinar

Hands-on activity

Walk through a plot. Identify weeds and determine how to deal with them.

Additional resources

- **Tomato Diseases and Disorders**, Mark Gleason, ISU Extension and Outreach. Explores the symptoms and management of common problems for field and greenhouse tomatoes.³
store.extension.iastate.edu/Product/Tomato-Diseases-and-Disorders
- **Plant and Insect Diagnostic Clinic – Plant Diseases**, Iowa State University. Find a list of plant diseases, specific signs, symptoms, cycle and methods of control on this website.
www.ent.iastate.edu/pidc
- **Organic Vegetable Production Systems, eXtension**. Find a list of disease management resources in organic farming systems.
www.extension.org/pages/59471/organic-vegetable-production-systems-disease-management-in-organic-farming-systems#
- **Organic Guides for Vegetables**, Cornell University.
nysipm.cornell.edu/organic_guide/veg_org_guide.asp

² Oregon has a comprehensive, holistic system to support beginning farmers. Rogue Farm Corps (<http://roguefarmcorps.org>) offers internship and training programs for beginning farmers, with support from Oregon State University Extension. OSU Extension provides several training programs, including an online course “Growing Farms: Successful Whole Farm Management” (<https://pace.oregonstate.edu/catalog/growing-farms-successful-whole-farm-management>) and a face-to-face classroom/hands-on program “Growing Agripreneurs” (extension.oregonstate.edu/sorec/grow-ag2015). Beginning farmers also have the opportunity to start their business in one of Oregon’s incubator farms such as Headwaters Farm incubator (<http://emswcd.org/farm-incubator/headwaters-farm>). “Friends of Family Farmers” helps farmers by advocating for farm-friendly policies, and supports access to land through iFarm Oregon (www.friendsoffamilyfarmers.org/ifarm/index.php?action=searchpage).

³ Monitor the ISU Extension and Outreach online store for further publications on specific crops, store.extension.iastate.edu.

CONTENT and OUTCOME

- › Prevent, detect and manage diseases on vegetable crops
- › Disease triangle

CONTACT

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CONTENT and OUTCOME

- › Season extension strategies (row covers, hoop houses, greenhouses)
- › Site selection
- › Soil management and fertility
- › High tunnel selection
- › Managing irrigation
- › Planting bed arrangement
- › IPM in high tunnels
- › Grants

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MODULE 9: Season extension

Narrative

Iowa High Tunnel Fruit and Vegetable Production Manual, Linda Naeve, ISU Extension and Outreach. This workbook provides growers with information on how to use high tunnels effectively, enhance productivity and net income, and learn from the experience of other high tunnel users.⁴ store.extension.iastate.edu/Product/Iowa-High-Tunnel-Fruit-and-Vegetable-Production-Manual

Additional resources

- *Explore the Profit Potential of High Tunnels*, Practical Farmers of Iowa (PFI). Search “high tunnels” on PFI’s archived farminars here: <http://practicalfarmers.org/farmer-knowledge/farminar-archive>
- *Lettuce Season Extension with Row Covers*, Vegetable Laboratory, ISU Extension and Outreach. This video produced by Ajay Nair, assistant professor and Extension specialist, and the lab staff shows the results of a study evaluating strategies; row covers and calcium chloride spray, to extend the season and grow a second crop.⁵ www.youtube.com/watch?v=WELQ2Bbn4k8&list=UUIA9Ylr9jAxHGSluiBpTedd

⁴ ISU Extension and Outreach Small Farm Sustainability program
www.extension.iastate.edu/smallfarms.

⁵ Find more research results and resources on the ISU Extension Sustainable Vegetable Production Laboratory website at
www.extension.iastate.edu/vegetablelab.

MODULE 10: Cover cropping

Narrative

Ajay Nair, assistant professor and extension specialist, hosted a webinar with Iowa Learning Farms, explaining cover crop management: the benefits, challenges, general characteristics of different crops, their specificities.

www.extension.iastate.edu/ilf/page/webinars

or <https://connect.extension.iastate.edu/p9qxc3x4t52/?launcher=false&fcsContent=true&pbMode=normal>

Summer Cover Crops for Fall Vegetable Production, ISU Extension and Outreach. This video examines different summer cover crops for fall vegetable production. www.youtube.com/watch?v=s92FCtxmlj8&feature=youtu.be

Worksheet

Cover crop worksheet from ISU Extension and Outreach. Coming soon.

Additional resources

- **Managing Cover Crops Profitably, 3rd Edition**. SARE. The ultimate reference for cover cropping, according to Ajay Nair, assistant professor and extension specialist at Iowa State University. It explores how and why cover crops work, and provides all the information needed to add cover crops to any farming operation.

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

- **Cover Crops, Practical Farmers of Iowa website**. A large section on their website is dedicated to relevant resources including publications, research, webinars and more.

practicalfarmers.org/member-priorities/cover-crops

Among them are:

- **Cover Crop Business Directory**, Practical Farmers of Iowa. A guide to businesses that supply seed and services to plant and manage cover crops in Iowa. www.leopold.iastate.edu/pubs-and-papers/2014-08-cover-crop-business-directory
- **Managing Cover Crops**, Practical Farmers of Iowa. Webinar featuring a question and answer session on cover crops. practicalfarmers.org/farmer-knowledge/farminar-archive/managing-cover-crops

CONTENT and OUTCOME

- › Cover crops benefits
- › Cover crop management
- › Different benefits

CONTACT

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CONTENT and OUTCOME

- › Safety using farm equipment
- › Basic maintenance
- › Cost estimates

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MODULE 11: Small farm equipment

Narrative

Farm Equipment, Missouri Beginning Farmers, University of Missouri website. Links include a guide on tractor size, tips for buying used equipment, etc.

beginningfarmers.missouri.edu/equipment.aspx.

Beginning Farmer Resource Network, The University of Maine website. Lists resources by category to help farmers gain knowledge and understand of how to best utilize space and equipment on the farm for housing, storage and productivity.

<http://umaine.edu/beginning-farmer-resource-network/home/equipment/>

Hands-on activity

Practice using small farm equipment.

Additional resources

- **Machinery Sharing Manual for Fruit and Vegetable Growers**, Georgeanne Artz, Linda Naeve, and William Edwards, ISU Extension and Outreach.
store.extension.iastate.edu/Product/Machinery-Sharing-Manual-for-Fruit-and-Vegetable-Producers
- **Ag Decision Maker - Crops Machinery**, ISU Extension and Outreach. Although the information listed here is not necessarily geared towards small farm equipment, it illustrates a good understanding of machinery economics.
www.extension.iastate.edu/agdm/cdmachinery.html
- **Windridge Implements**, Case International Harvester. One of Iowa's only implement dealerships offering specialty crop equipment. They host demonstration days to showcase their equipment during the summer.
www.windridgeimplements.com

MODULE 12: Whole farm design and management

Narrative

The farm plan includes two basic requirements: rotating crops and building soil fertility (see Module 1). Putting this plan on paper is not only necessary for certification, but also helps track how well the plan is working.

Consider:

- Crop rotations,
- Double cropping and,
- Companion planning.

Farm structure: consider what is most efficient for the equipment that will be used and what makes the best use of the available human labor.

Consider:

- Raised beds,
- Rows (easiest if using mechanized equipment but wasteful of space) vs. blocks (not amenable to power equipment) and,
- Vertical structures (trellises) for vegetables such as peas, squash, tomatoes and other spreading plants.

Hands-on activity

Design a whole farm plan.

Worksheet

- ***Vegetable Garden Worksheets for Planning Your Home Garden***, Vegetable Gardening Online. These free, downloadable worksheets help growers organize all aspects of their production from garden layout to planting, weeding, harvesting, composting and fertilizing. www.vegetable-gardening-online.com/vegetable-garden-worksheets.html

Additional resources

- ***Garden Planning Program***, downloadable resources, Seed Savers Exchange. This planner makes it easy to lay out vegetable beds and includes information; required space, calendar, suggested rotation, etc., for more than 180 plants. gardenplanner.seedsavers.org/?_ga=1.104313344.1414845258.1422632078
- ***Worksheets, interactive planning worksheets***. Cornell University. These worksheets help develop the foundation of a farm plan. www.nebeginningfarmers.org/farmers/worksheets-2/

CONTENT and OUTCOME

- › Recap on crop rotation, scheduling, timing, double cropping and companion planting
- › Farm calendar
- › GOAL: a farm plan

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TOPIC B: Post-harvest handling

The overall objective of this section is to help farmers handle products safely and efficiently after harvest.

Modules

Module 1: Harvesting and post-harvest handling

Module 2: Food safety

Module 3: Seed saving

Resources

ISU Extension and Outreach Food Safety website:
www.extension.iastate.edu/foodsafety

Purple Pitchfork website. Chris Blanchard's Business Tools for Farmers at www.purplepitchfork.com presents a list of helpful tools, as well as food safety and post-harvest handling resources. Subscribe to the newsletter to receive weekly updates and information.

MODULE 1: Harvesting and post-harvest handling

Narrative

Post-harvest handling is the stage of crop production that includes cooling, cleaning, sorting and packing the crop for later stages in the process (storage, transportation, delivery). How a product is handled during this crucial period largely determines its quality and safety for consumption. This module is mostly hands-on.

Hands-on activity

Walk through and visual assessment of harvesting readiness.

Additional resources

- ***Harvesting and Storing Vegetables***, Linda Naeve and Richard Jauron, ISU Extension and Outreach. This publication provides detailed information on how to store more than 30 types of vegetables, including recommended storage temperatures, humidity, storage life, and suggested methods for extended preservation.
store.extension.iastate.edu/Product/Harvesting-and-Storing-Vegetables
- ***Grower's Manual: A Template for Grower Cooperatives***, Leopold Center for Sustainable Agriculture. Joanna Hamilton's manual was adapted from a guide developed by GROWN Locally, a producer cooperative in northeast Iowa. This manual serves as a model to establish standards for pre- and post-harvest practices and the product specifications used with local foodservice establishments.
www.leopold.iastate.edu/pubs-and-papers/2011-10-growers-manual
- ***Post-Harvest Handling Decision Tool***, Leopold Center for Sustainable Agriculture. Each crop has an ideal range for storage temperature and humidity. Chris Blanchard's online tool describes handling systems for different groups of crops and general considerations for designing your own post-harvest handling system.
www.leopold.iastate.edu/cool_tools/post_harvest_handling_decision_tool

CONTENT and OUTCOME

- › Harvest timing and maturity assessment
- › Harvesting methods, avoiding damage in the field
- › Appropriate storage methods

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CONTENT and OUTCOME

- › Identifying food safety hazards
- › Minimizing hazards
- › Food safety plan basics
- › Basics on microorganisms
- › Maintaining records for produce items
- › Proper hygiene practices to use when handling produce
- › Basic food regulations at federal, state and local levels and key concepts of the FSMA related to fresh produce

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Cathy Strohbehn

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MODULE 2: Food safety

Narrative

Iowa State University created an *online food safety training* course for farmers who sell products to farmers markets.

www.safeproduce.cals.iastate.edu/training

Best Practices Safe Food Handling on the Farm, ISU Extension and Outreach. Cathy Strohbehn's comprehensive presentation gathers food safety information for producers who want to sell food at farmers markets. iastate.app.box.com/s/igdkp6ibf948182kseyr

Worksheet

- *On-farm Food Safety: Food Handling Guide*, Catherine Strohbehn, Margaret Smith, Paul A. Domoto, and Lester Wilson, ISU Extension and Outreach. This is a guide for safe food handling habits related to health, hygiene and hand washing. store.extension.iastate.edu/Product/On-farm-Food-Safety-Food-Handling-Guide
- *On-farm Food Safety: Guide to Good Agricultural Practices*, Catherine Strohbehn, Dan Henroid, Jason Ellis, and Lester Wilson ISU Extension and Outreach. This guide offers a blueprint for developing an on-farm food safety plan that documents your risk reduction efforts. store.extension.iastate.edu/Product/On-farm-Food-Safety-Guide-to-Good-Agricultural-Practices-GAPs
- *On-Farm Food Safety: Cleaning and Sanitizing Guide*, Catherine Strohbehn and Paul A. Domoto, ISU Extension and Outreach. This guide provides suggested checklists, procedures and schedules for documenting food safety plans. store.extension.iastate.edu/Product/On-farm-Food-Safety-Cleaning-and-Sanitizing-Guide
- Templates for *Standard Operating Procedures and Logsheets* on the University of Minnesota's website: <http://safety.cfans.umn.edu/fsp4u/>

Additional resources

- ISU Extension and Outreach Food Safety website: www.extension.iastate.edu/foodsafety
- Iowa GAP Center blog: blogs.extension.iastate.edu/iowagap
- Iowa Food Safety blog: blogs.extension.iastate.edu/foodsafety
- *Iowa Food Marketing Regulations: A Guide for Small-Scale Producers*, Leopold Center for Sustainable Agriculture. www.leopold.iastate.edu/pubs-and-papers/2012-09-iowa-food-marketing-regulations

MODULE 3: Seed saving

Narrative

Seed Savers, an extraordinary nonprofit organization based in Northeast Iowa, is planning to conduct an online seed saving class that will be available in fall 2015.

Hands-on activity

Seed saving

Worksheet

- *Seed Savers Exchange Seed Saving Chart*
exchange.seedsavers.org/storage/CC27D97F-06A3-464A-818D-2A1E30104DDE.pdf

Additional resources

- *Seed Savers Exchange*
 - *The Seed Garden: The Art and Practice of Seed Saving* will be an excellent resource for both beginning farmers and advanced seed savers. The book has over 250 color photographs that clearly illustrate the different techniques that can be used when saving seeds.
 - *Resources exchange*
seedsavers.org/csrp/resources.aspx
 - *Educational resources*
exchange.seedsavers.org/education/index.aspx
 - *Webinars*
www.seedsavers.org/Education/Webinars
 - *Seed Savers Exchange YouTube channel*
www.youtube.com/user/SSEHeritageFarm
- *Organic Seed Alliance's Seed Saving Guide for Gardeners and Farmers* is a comprehensive and valuable tool for saving seeds.
www.seedalliance.org/uploads/publications/Seed_Saving_Guide.pdf

CONTENT and OUTCOME

- › Using seeds from own crops (threshing/extracting/ drying seeds for storage)
- › Basics of seed selection

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TOPIC C: Business planning and basic farm finances

The objectives of this section are to: 1) build a business plan for a successful farm, and 2) gain a basic understanding of farm finances to identify the best tools to farm profitably.

Modules

Module 1: Starting out with financial management – Why is it important?

Module 2: Writing a business plan (Part 1/3) – History and current situation: What do you have to work with?

Module 3: Writing a business plan (Part 2/3) – Vision, mission and goals: Where do you want to go?

Module 4: Writing a business plan (Part 3/3) – Strategic planning and evaluation: What routes will take you where you want to go?

Module 5: Farm data collection and organization tools

Module 6: Organizing basic financial information

Module 7: Financing from loan providers and agencies

Resources

- ***Building a Sustainable Business, A Guide to Developing a Business Plan for Farms and Rural Businesses.*** This SARE publication developed by the Minnesota Institute for Sustainable Agriculture (MISA) (2010) is available free online at www.sare.org/Learning-Center/Books/Building-a-Sustainable-Business. This publication is used as a reference by many programs, including Practical Farmers of Iowa's (PFI) Saving Incentive Program. Those who use this book to build a business plan appreciate its logical flow and systems perspective.
- ***AgPlan.*** The Center for Farm Financial Management (Ag-Value Added Business Plan) provides this free online business plan that is used by several farm training programs, including Annie's Project.⁶ agplan.umn.edu
- ***Fearless Farm Finances, Midwest Organic & Sustainable Education Service.*** This unique resource is packed with instructions, tips and tools for a successful farm financial system. mosesorganic.org/fearless-farm-finances
- ***Small Business Association*** (SBA) contains many resources, including a wealth of information and guides to writing a business plan. www.sba.gov/writing-business-plan
- ***Beginning Farmer Business Planning, Marketing, Sheep, Goat and Poultry Resources,*** NCAT-ATTRA. This website assembles narrated presentations. At the end of the 4-part series, users should have outlined the skeleton of a business plan. attra.ncat.org/oasdf

⁶ www.extension.iastate.edu/annie/

MODULE 1: Starting out with financial management

Narrative

Building a Sustainable Business, SARE. Task 1: identify your values and what is important to you. Think about what your interests are and why/what you want to farm.

Worksheet

- **Building a Sustainable Business**, SARE. Worksheet pages 24-25 will assist in identifying values.
- **Farm Business Start-Up Checklist**, NCAT - ATTRA, helps new farm business owners review everything they need to consider (regulations, permits, business structure, tax liabilities, etc.) IP430. <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=430>

Additional resources

- **Fearless Farm Finances**, MOSES. Section 1: Financial management: getting a grasp on startup finances and setting goals. mosesorganic.org/fearless-farm-finances

CONTENT and OUTCOME

- › Identify values
- › Benefits of financial management
- › Farm startup finances: What does it cost, what do you want, how do you feel about risks?
- › Tips for starting up

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CONTENT and OUTCOME

- › Assess current situation (market, operation, human resources, finances)
- › SWOT analysis

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MODULE 2: Writing a business plan (part 1 of 3) – farm history and current situation: what do you have to work with?

Narrative

Task 2. Building a Sustainable Business: “Farm history and current situation – what do you have to work with?” SARE.

Worksheet

- ***Building a Sustainable Business***. SARE. Worksheet pages 67-86, Identify current assets, describe your production systems and what those entail. www.sare.org/Learning-Center/Books/Building-a-Sustainable-Business
- ***“Business Description”*** section. AgPlan. agplan.umn.edu

MODULE 3: Writing a business plan (part 2 of 3) – vision, mission and goals: where do you want to go?

Narrative

Task 3: Building a Sustainable Business: “Where do you want to go?” SARE.

Worksheet

- **Building a Sustainable Business**, SARE. Worksheet pages 97-101, vision, mission and goals. www.sare.org/Learning-Center/Books/Building-a-Sustainable-Business
- “**Executive summary**” section, AgPlan. agplan.umn.edu

Additional resources

- **Appendix A. Business Plan: Values, Vision, Mission and Goals.**
Leah Risselman. Presentation given to ISU’s Horticulture Enterprise Management class, Hort 465.
www.extension.iastate.edu/localfoods/beginning-farmer-resource-guide

CONTENT and OUTCOME

- › Vision
- › Mission
- › Set and prioritize goals for the business plan

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CONTENT and OUTCOME

Develop a business strategy:

- › Marketing strategy
- › Operations strategy
- › Human resources strategy
- › Financial strategy

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MODULE 4: Writing a business plan (part 3 of 3) – strategic planning and evaluation: what routes will take you where you want to go?

Narrative

Task 4. Building a Sustainable Business: “What routes will take you where you want to go?” SARE.

Worksheet

- **Building a Sustainable Business**, SARE. Worksheet pages 185-231, covers the different areas of business strategy including marketing, operations, human resources and financial plans.
- “Operations,” “Marketing plan,” “Management and organization,” and “Financial plan,” AgPlan. agplan.umn.edu

Additional resources

- **Appendix B. Identifying Human Resource Needs in a Business.** Leah Riesselman. Presentation given to ISU’s Horticulture Enterprise Management class, Hort 465.
www.extension.iastate.edu/localfoods/beginning-farmer-resource-guide

MODULE 5: Farm data collection and organization

Narrative

The Manual: Quicken for Farm/Ranch Records, Oklahoma State University Agriculture Economics Extension.
www.agecon.okstate.edu/quicken/download.asp

Fearless Farm Finances, MOSES. Section 2.
mosesorganic.org/fearless-farm-finances/

Two presentations from the University of Vermont:

- **Recordkeeping on a Diversified Organic Farm**, Paul and Sandy Arnold.
www.uvm.edu/vtvegandberry/FarmBudgets/ArnoldsRecordkeeping.pdf
- **Recordkeeping for Wholesale and Retail Vegetable Farm**, River Berry Farm.
www.uvm.edu/vtvegandberry/FarmBudgets/RiverBerryRecordkeeping.pdf

Worksheet

- Set up Quickbooks/Quicken account, or Microsoft Excel recordkeeping template.
 - **Keeping Good Records**, Northeast Beginning Farmers Project, Cornell University.
nebeginningfarmers.org/farmers/achieving-profitability/profitability-tutorial/managing-your-finances (Scroll to “Recordkeeping Options”)

Additional resources

- **Evaluating Farm Accounting Software**. Kelvin Leibold, ISU Extension and Outreach. This publication gives an overview of different accounting software available, as well as tutorials and templates for different software.
www.extension.iastate.edu/agdm/wholefarm/html/c6-32.html
- **Quicken or Quickbooks, What’s the Best Choice for Agricultural Producers?** Damona Doye, Oklahoma State University. This paper compares and contrasts the applicability of both commercial software packages.
agecon.okstate.edu/faculty/publications/3880.pdf

CONTENT and OUTCOME

- › Bookkeeping tools
- › Setting up financial records
- › Data entry
- › Tracking non-financial data

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CONTENT and OUTCOME

- › Balance sheets
- › Income statements
- › Cash flows
- › Enterprise budgets

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MODULE 6: Organizing basic financial information

Narrative

Organizing basic financial information: balance sheet, income statement, understanding cash flows. Presentation by Craig Chase, ISU Extension and Outreach Local Foods program manager.

www.extension.iastate.edu/agdm/fieldstaff/cchase.html

Fearless Farm Finances, Section 3. MOSES.

mosesorganic.org/fearless-farm-finances

Worksheet

Find template balance sheets at:

- **Ag Decision Maker website**, ISU Extension and Outreach. View Microsoft Excel spreadsheet links.
www.extension.iastate.edu/agdm/wholefarm/html/c3-19.html
- **Your Net Worth Statement**, ISU Extension and Outreach Ag Decision Maker.
<http://www.extension.iastate.edu/agdm/wholefarm/html/c3-20.html>

Additional resources

- **Midwest Organic and Sustainable Education Service (MOSES)** website gathers financial management resources such as balance sheet, income statements and statement of cash flow templates.
mosesorganic.org/farming/farm-finances/financial-management-resources
- **Iowa Fruit & Vegetable Production Budgets**, Craig Chase, ISU Extension and Outreach Ag Decision Maker. Find enterprise budgets for more than 15 vegetables as well as general considerations when developing your own enterprise budget here:
www.extension.iastate.edu/agdm/crops/html/a1-17.html
- **Developing a Balance Sheet**. Damona Doye, Oklahoma State University Extension.
riskmgmt.uwagec.org/FinancialRisk/Develp%20a%20Balance%20Sheet.pdf
- **Developing a Cash Flow Plan**. Damona Doye, Oklahoma State University Extension.
riskmgmt.uwagec.org/FinancialRisk/Devel%20a%20cash%20flow%20plan.pdf
- **Developing an Income Statement**. Damona Doye, Oklahoma State University Extension.
riskmgmt.uwagec.org/FinancialRisk/Devl%20an%20Income%20statement.pdf

MODULE 7: Financing from loan providers and federal agencies

Narrative

Appendix C. Financial Assistance for Farmers, Andy Hunziker, Farm Loan Manager, Farm Service Agency. Presentation to ISU's Horticulture Enterprise Management class covers different financial assistance programs for farmers.

www.extension.iastate.edu/localfoods/beginning-farmer-resource-guide

Additional resources

- **Farm Loan Programs**, U.S. Department of Agriculture publishes a guide to the different direct and guaranteed loan programs available through the Farm Service Agency (simplified chart appears on p. 12-13).

www.fsa.usda.gov/Internet/FSA_File/fsa_br_01_web_booklet.pdf

CONTENT and OUTCOME

- › Balance sheets
- › Income statements
- › Cash flows
- › Enterprise budgets

CONTACT

Contact your local Farm Service Agency county office.

Find it here:

<http://offices.sc.egov.usda.gov/locator/app>

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Module 3 – Basic plant biology and nutrient management

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Module 3 – Writing a business plan (part 2 of 3)

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Module 4 – Writing a business plan (part 3 of 3)

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Appendix I: Other sources

Appendix A: Business plan—Values, vision, mission and goals

Hort/AgEd S 465A

Horticulture Enterprise Management

Compiled by

Leah Risselman, ISU Department of Horticulture

<http://www.extension.iastate.edu/localfoods/beginning-farmer-resource-guide>.

Appendix B: Identifying human resource needs in a business

Hort/AgEd S 465A

Horticulture Enterprise Management

Compiled by

Leah Risselman, ISU Department of Horticulture

<http://www.extension.iastate.edu/localfoods/beginning-farmer-resource-guide>.

Appendix C: Food Service Agency

Financial assistance for farmers

Compiled by

Andy Hunziker, farm loan manager, Boone County Farm Service Agency,
Boone, Iowa

<http://www.extension.iastate.edu/localfoods/beginning-farmer-resource-guide>.

Appendix II: Organizations and programs that support beginning farmers

1A. Formal training in academia

College courses:

- Iowa Valley Community College:
Entrepreneurial and Diversified Agriculture—
<https://mcc.iavalley.edu/academic/agriculture-animal-science/entrepreneurial-ag>.
- Iowa Western Community College: *Dream to farm*—
<http://www.leopold.iastate.edu/news/leopold-letter/2013/winter/course>
- Indian Hills: *Sustainable Agriculture and Entrepreneurship*—
<http://www.indianhills.edu/courses/tech/sustainableagriculture.html>.
- Iowa State University courses:
Hort 465 (Horticulture Enterprise Management)
Hort 471 (Vegetable Production and Management)
<http://catalog.iastate.edu/azcourses/hort/hort.pdf>.

1B. Online courses and webinars

Webinars (Iowa):

- Practical Farmers of Iowa (PFI): *Farminars*—
<http://practicalfarmers.org/news-events/events/farminars>.
- ISU Extension and Outreach: *Small Farm Sustainability*—
<http://www.extension.iastate.edu/smallfarms>.

Online courses (out of state):

- Oregon State University Extension: *Growing Farms*—
<https://pace.oregonstate.edu/catalog/growing-farms-hybrid-course-beginning-farmers>.
- Cornell University Cooperative Extension:
Beginning Farmer Program—
<http://moodle2.cce.cornell.edu/course/index.php?categoryid=13>.
- University of Vermont Extension: *Growing places*—
http://www.uvm.edu/newfarmer/?Page=classes/growing_places.html&SM=classes/sub-menu.html.

Other:

- Land Stewardship Project: *Farm Beginnings Program*—
<http://landstewardshipproject.org/morefarmers/farm>.

Appendix II

2A. Gaining practical experience

Internships:

- **Labor4Learning (Practical Farmers of Iowa):**
Entrepreneurial and Diversified Agriculture—
<http://practicalfarmers.org/member-priorities/beginning-farmers/labor4learning>.
- **The Farming Institute:** *2-month immersion program with field and classroom learning.*
<http://www.thefarminginstitute.com>.

Mentorship and apprenticeships:

- **Women Food & Ag Network (WFAN):** *Harvesting our potential*—
<http://wfan.org/our-programs/harvesting-our-potential>.
- **Iowa State University courses:**
Hort 465 (Horticulture Enterprise Management)
Hort 471 (Vegetable Production and Management)
<http://catalog.iastate.edu/azcourses/hort/hort.pdf>.

2B. Try it out!

Farm incubators:

One or more parcels of land where one or multiple producers are farming and marketing farm products through their own farm business enterprise, often with organizational access to training/technical assistance opportunities on farm business and production practices.

- **National Incubator Map**—
<http://nesfp.org/food-systems/national-incubator-farm-training-initiative/national-incubator-map>.

In Iowa:

- **Global Greens**—
<http://lsiowa.org/index.php/services/refugee/programs/global-greens>.
- **Others in the works... show your interest!!**
topaloff@iastate.edu.

3A. Build a business plan—Courses

Local courses/training (see block 1B):

- **Annie's Project: Risk Management Education for Farm and Ranch**—
<http://www.extension.iastate.edu/annie/iowaAnnie.html>.

Online training courses:

- **Center for Farm Financial Management**—
<http://www.cffm.umn.edu/products/FPTrain.aspx>.

3B. Build a business plan—Resources

- ISU Extension and Outreach: *Writing a business plan*—
<http://www.extension.iastate.edu/agdm/wholefarm/html/c5-68.html>.
- University of Minnesota: *AgPlan*—
<https://agplan.umn.edu>.
- PFI's resource guide to business planning—
<http://practicalfarmers.org/wp-content/uploads/2014/08/PFI-Resource-List-for-Business-Planning.pdf>.

4A. Access to capital

- FSA Beginning farmer loans—
<http://www.fsa.usda.gov/FSA/webapp?area=home&subject=fmlp&topic=bfl>.
- FSA Microloans—
http://www.fsa.usda.gov/Internet/FSA_File/microloans_facts_2014.pdf.
- Beginning farmer tax credits: *Incentive to lease, sell or custom hire a beginning farmer*—
<http://iowafinanceauthority.gov/Public/Pages/PC204LN48>.
- PFI: *Saving Incentive Program*—
<http://practicalfarmers.org/member-priorities/beginning-farmers/savings-incentive-program>.

More information about IDAs at <http://cfed.org/programs/idas>.

4B. Access to land

- Beginning Farmer Center: *Legal resource and matching program—Aglink*—
<http://www.extension.iastate.edu/bfc/farm>.
- PFI: *Find A Farmer*—
<https://www.findafarmer.net>.

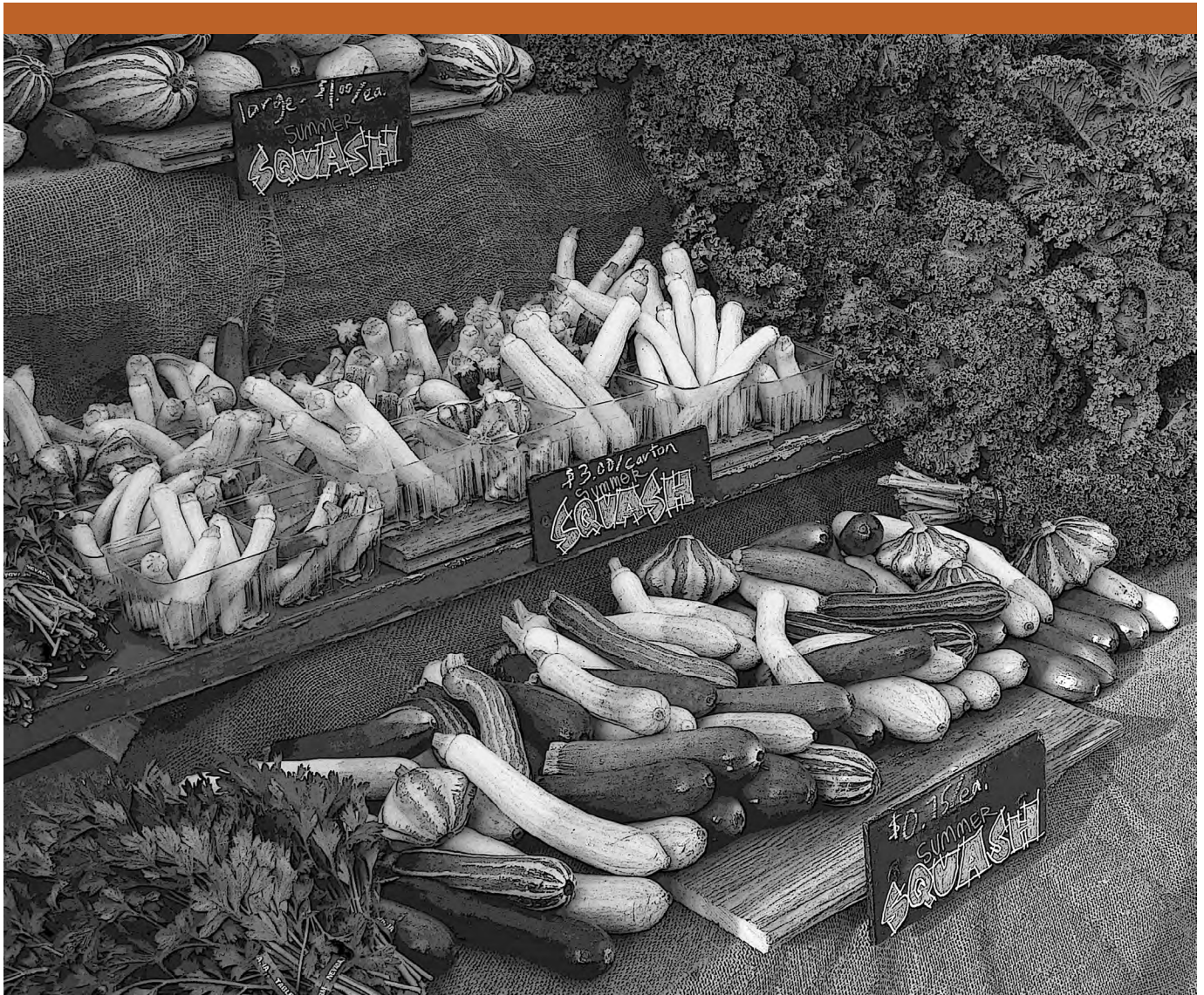
Tip: “*Networking, talking and engaging with your community will increase your chances of finding something you want.*”—

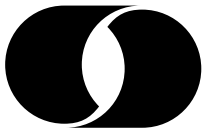
Dave Baker, ISU Beginning Farmer Center.

More information or additional input, contact
Alice Topaloff, topaloff@iastate.edu.

Appendix III: List of contacts

Topic	Contact	Page
Vegetable production		
Soil	Ajay Nair, nairajay@iastate.edu	10
Composting	Hortline, https://expert-hort.sws.iastate.edu Master Gardeners, www.mastergardener.iastate.edu/	11
Plant biology	Master Gardeners, www.mastergardener.iastate.edu Diana Cochran, dianac@iastate.edu	12
Irrigation	Ajay Nair, nairajay@iastate.edu Joe Hannan, jmhannan@iastate.edu	13
Field preparation and planting	Hortline, https://expert-hort.sws.iastate.edu Master Gardeners, www.mastergardener.iastate.edu	14
Insect control/entomology	Patrick O'Malley, omall@iastate.edu	15
Weed management	Ajay Nair, nairajay@iastate.edu	16
Disease control/plant pathology	Lina Rodriguez Salamanca, lina@iastate.edu www.ent.iastate.edu/pidc	17
Season extension	Joe Hannan, jmhannan@iastate.edu Linda Naeve, lnaeve@iastate.edu	18
Cover cropping	Ajay Nair, nairajay@iastate.edu	19
Small farm equipment	Georgeanne Artz, gartz@iastate.edu Linda Naeve, lnaeve@iastate.edu	20
Whole farm planning	Gail Romberger-Nonnecke, nonnecke@iastate.edu	21
Post-harvest		
Harvesting and post-harvest handling	Linda Naeve, lnaeve@iastate.edu Richard Jauron, rjauron@iastate.edu	23
Food safety	Angela Shaw, angelaml@iastate.edu Catherine Strohbeh, cstrohbe@iastate.edu	24
Seed saving	Seed Savers, www.seedsavers.org Toby Cain, toby@seedsavers.org Grant Olson, grant@seedsavers.org	25
Finances		
Business planning	Christa Hartsook, hartc@iastate.edu Ray Hansen, hansenr@iastate.edu	27-30
Organizing financial information	Damona Doye, damona.doye@okstate.edu Don Hofstand, agdm@iastate.edu Craig Chase, cchase@iastate.edu	31-32
Financing from loan providers	Farm Service Agency, http://offices.sc.egov.usda.gov/locator/app?state=ia&agency=fsa	33





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