



University of Idaho
Extension

GROWING FRUITS, VEGETABLES AND OTHER CROPS ON SMALL ACREAGES

**JENNIFER JENSEN &
MELISSA HAMILTON
UI EXTENSION
10 ACRES AND A DREAM**

OBJECTIVES

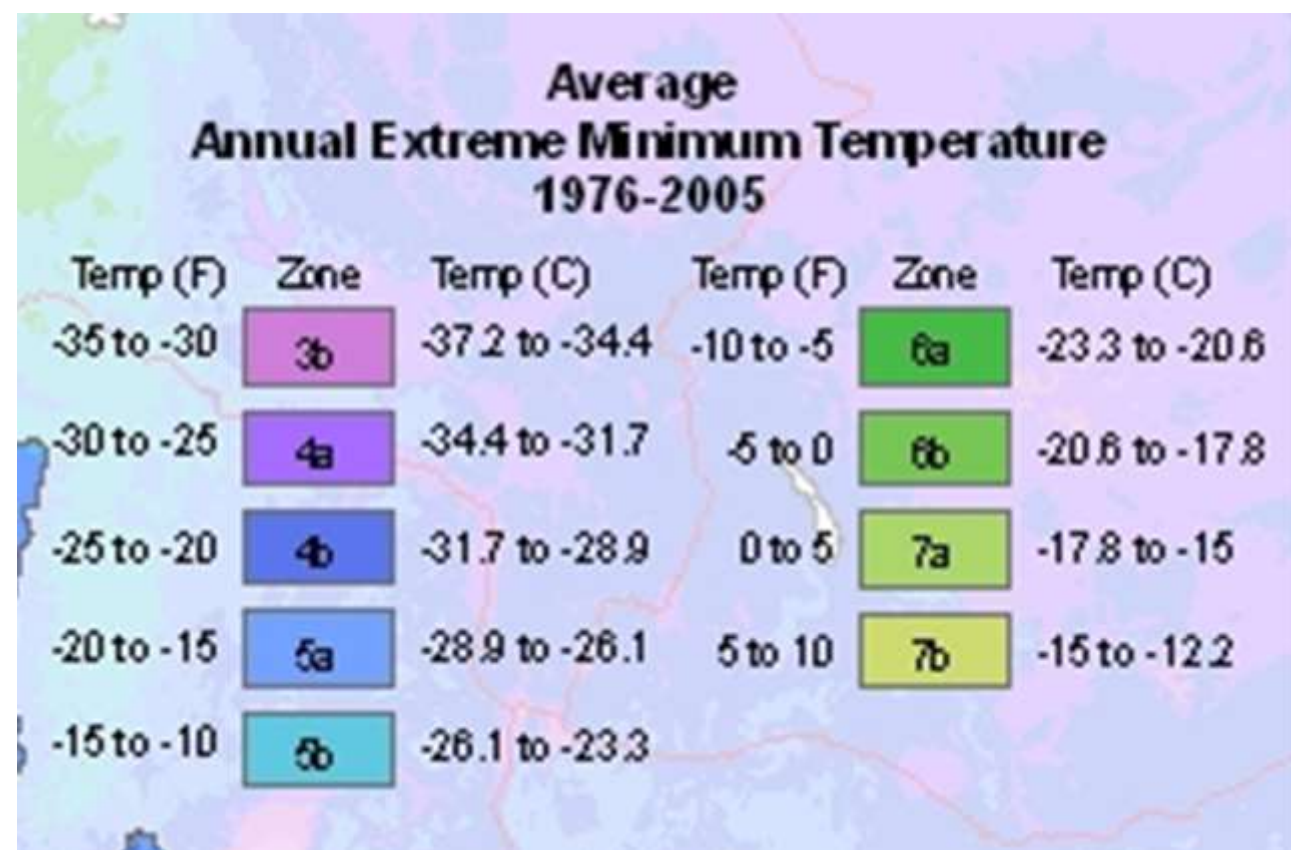
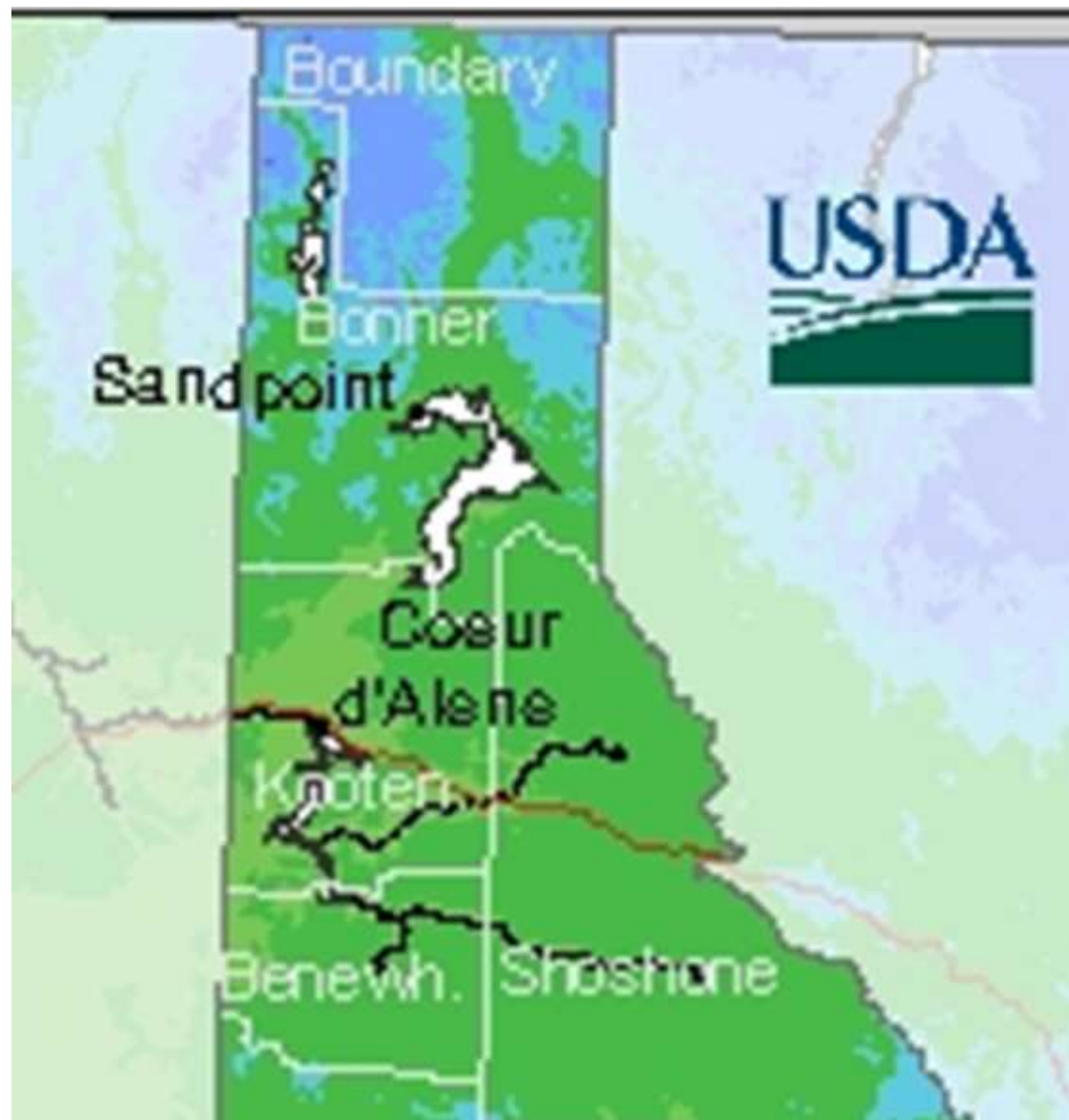
- Evaluate your natural resources
- Give an overview of season extension techniques
- Set goals
- Review garden start-up basics
- Begin planning your garden for maximum productivity
- Discuss harvest and handling
- Determine if market gardening is right for you, your family and your land

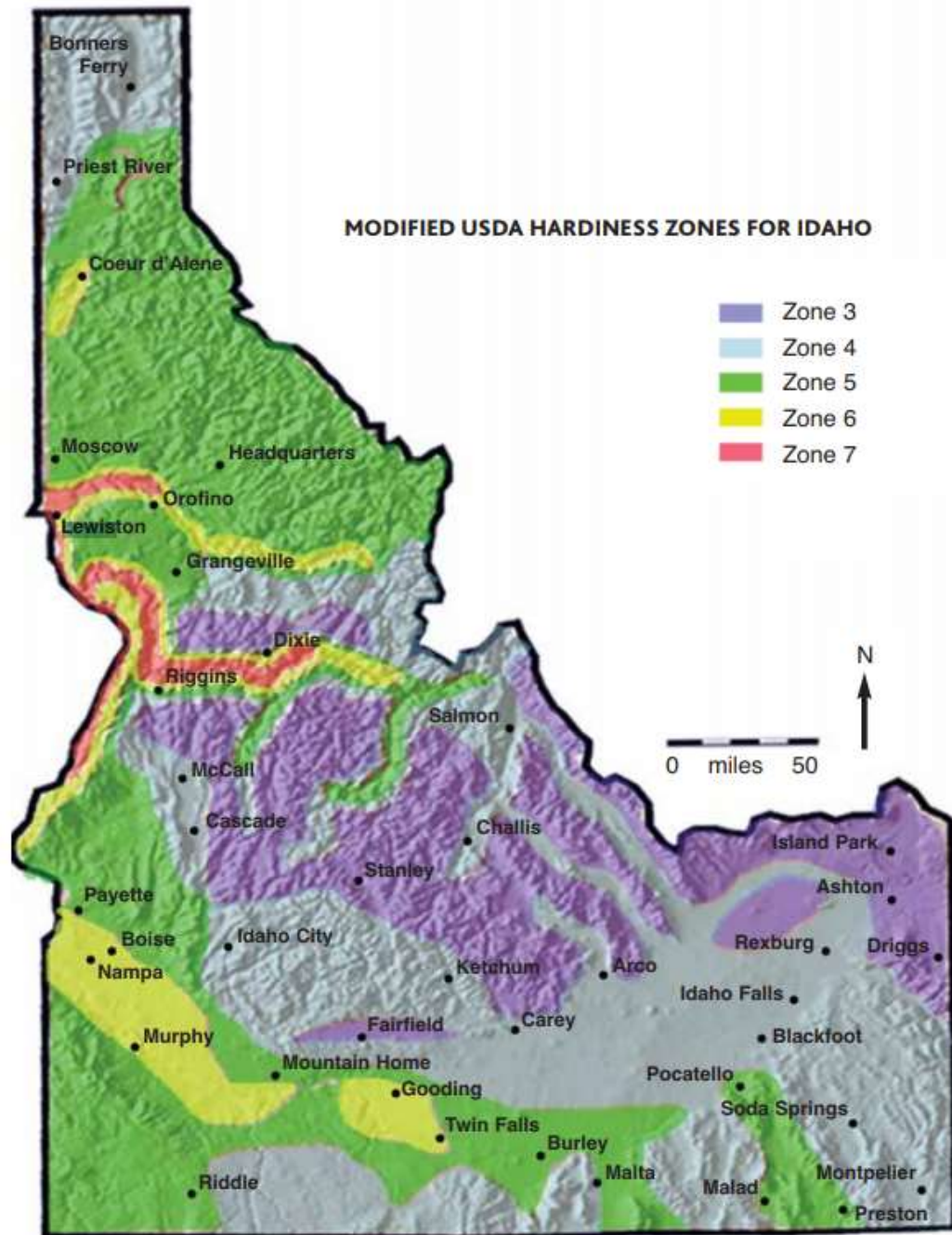
NATURAL RESOURCES

- Climate
 - USDA Hardiness Zone
 - Frost Free Dates

Determine Your Garden Microclimate

- Keep a log of minimum low readings
- In general, air temperature declines 3.5–5 °F for every 1,000 foot increase in elevation (WSU FS181E)
- Consider cold sinks or frost pockets
- Consider direction property faces





SHORT-SEASON, HIGH-ALTITUDE GARDENING

Introduction to short-season gardening in Idaho

by Stephen L. Love, Kathy Noble, and Stuart Parkinson

INTRODUCTION
Many of us who garden in Idaho face the challenges brought on by lack of summer warmth, spring and fall frost, extreme winter cold, or desiccation from frequent wind. Growing beautiful and productive plants in the high desert or mountain regions of Idaho requires unique approaches and an attention to detail that are rarely discussed in popular garden guides.

This publication introduces the Short-Season/High-Altitude Gardening series specifically designed to provide effective, comprehensive ideas for gardening where Idaho's unique combination of extreme climate, weather, growing, and geography presents obstacles to successful gardening. Subsequent publications provide details on managing specific kinds of plants in the short-season garden.

CONTENTS

INTRODUCTION	1
DEFINING THE SHORT-SEASON, HIGH-ALTITUDE ZONE	1
HOW TO USE THIS SHORT-SEASON CLIMATE GUIDE	2
PLANTS OF INTEREST	4
Map and Appendix	4
Local Weather Patterns	4

DEFINING THE SHORT-SEASON, HIGH-ALTITUDE ZONE
The Short-Season/High-Altitude Gardening series is for gardeners living within Idaho's harshest climates, specifically those rated USDA hardiness zone 4 or colder, situated at an elevation above 4,500 feet, or with a frost-free period of fewer than 110 days. Although many locales throughout the state experience these conditions, they are most common in the upper Snake River Valley, the southeastern and southern highlands, the high deserts north of the Snake River, the central mountains, and the coldest valley and mountain locations in the northern panhandle. Peruse table 1 to determine if you live in or near a city that fits these criteria.

Hardiness zone designations in table 1 are modified from those in official USDA hardiness zone maps. These modified designations are based on actual daily record low temperatures for each city for the past 30 years (data provided by the Western Region Climate Center [www.wrcc.dri.edu/]) rather than on average annual minimum temperatures. As a result, some locales are rated one zone colder than in corresponding USDA maps.

A new hardiness zone map for Idaho incorporates the new designations. It provides much greater geographic detail than any previously available map and should better predict plant survival in many of Idaho's harsh climate locations.

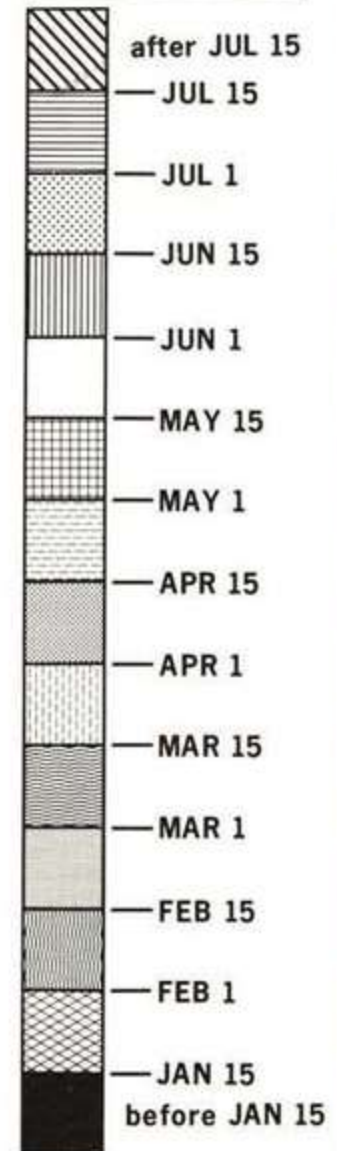
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Frost Free Dates

SPRING FREEZE OCCURRENCE
10% PROBABILITY OF 28°F OR LESS ON A LATER DATE

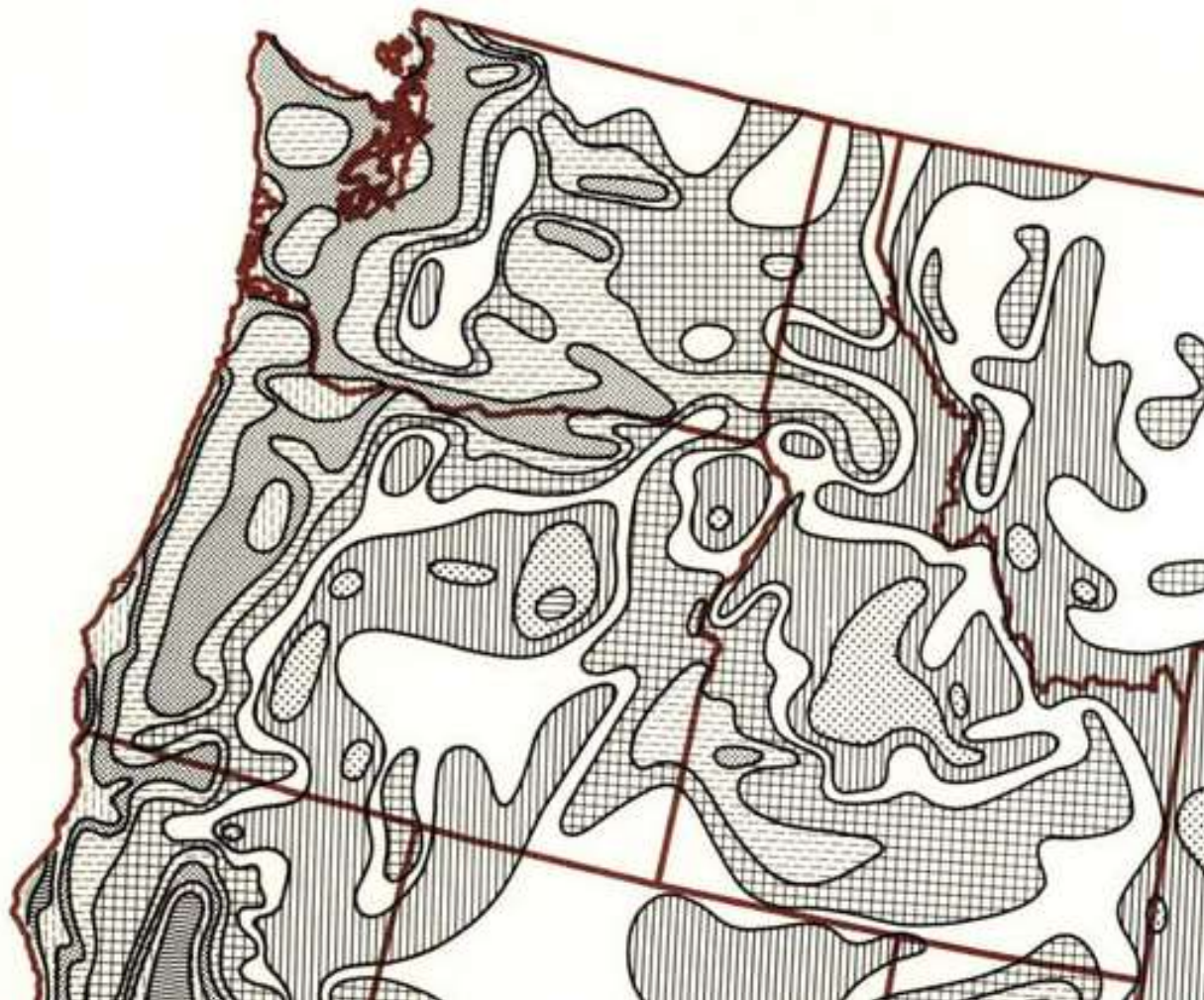


LEGEND

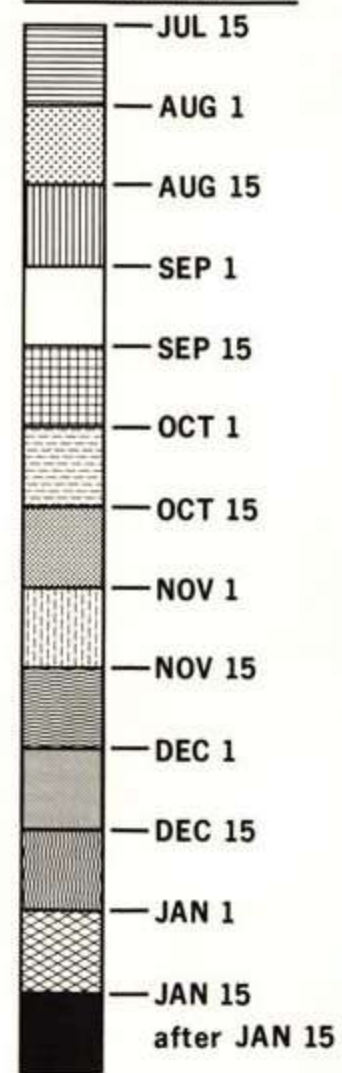


FALL FREEZE OCCURRENCE

10% PROBABILITY OF 28°F OR LESS ON AN EARLIER DATE



LEGEND





SEASON EXTENSION

NATURAL RESOURCES

- **Water**
 - Source
 - Irrigation System
 - Crops
 - Size of garden
 - Cost
 - Labor requirement



IRRIGATION SYSTEMS

- Surface Irrigation
 - Furrow/Flood Irrigation
- Aerial Irrigation
 - Sprinkler Systems
- Drip Irrigation
 - Drip Hoses



IRRIGATION FACTORS

- Rooting Depth
 - Shallow rooting plants (lettuce)
 - Deep rooting plants (tomatoes, trees)
- Soil Type and Depth
 - Sandy soil = little water holding capacity
 - Clay soil = much greater water holding capacity
- Stage of Growth
 - Young plants generally need less water than mature plants
 - Moisture stress can be more severe during certain stages than others.

NATURAL RESOURCES

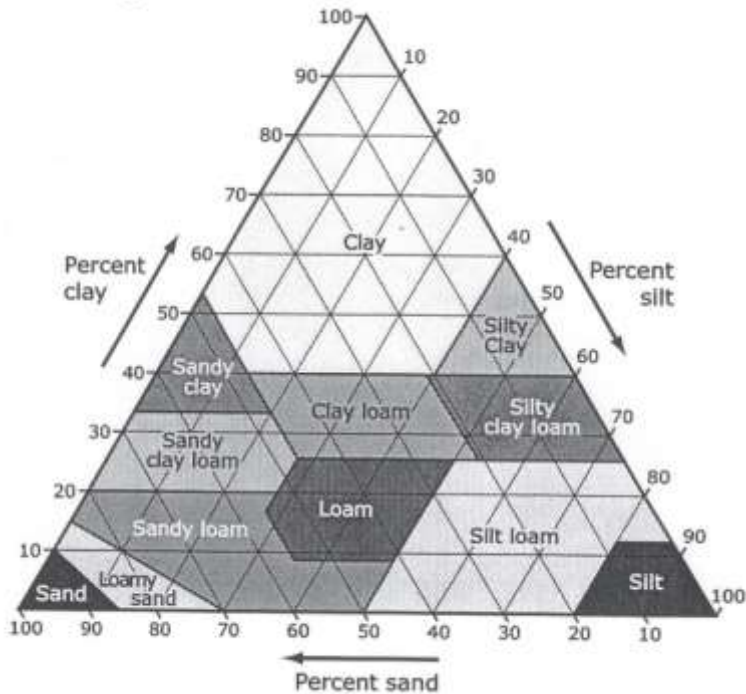
• Land and Soil

- Size
- Aspect
- Elevation
- Soil Characteristics
 - Texture
 - Nutrients
 - pH
 - Organic Matter
 - Living Soil Components



SOIL TEXTURE

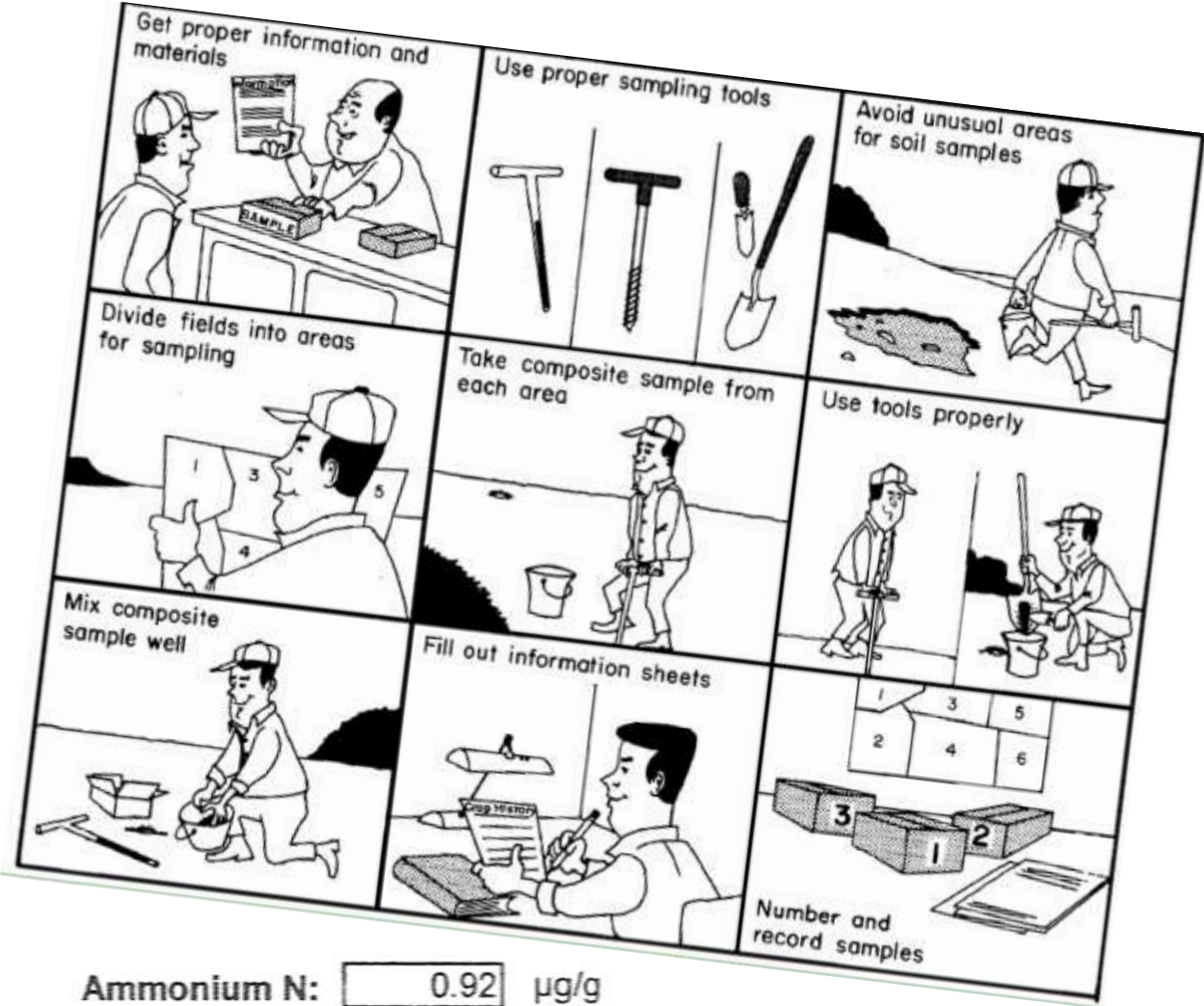
- Determined by the relative amounts of sand, silt and clay.
- Soil Texture Triangle



Living Soil Components



SOIL TESTING FOR NUTRIENTS, pH & ORGANIC MATTER



pH: Saturated Paste

Bicarbonate P + K Acetate P + K

Available P: µg/g

Available K: µg/g

Ammonium N: µg/g

Nitrate N: µg/g

Organic Matter: %

Sulfate-S: µg/g

Boron: µg/g



United States Department of Agriculture
Natural Resources Conservation Service

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- <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

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Setting Goals

Your roadmap to
success in any garden
enterprise

MAKE A PLAN FOR YOUR GOALS

- Plant Selection
- Choose what your like to eat?





Growing tree fruits in short-season gardens

by Stephen L. Love, Ernaeil Fallahi, and Kathy Noble

INTRODUCTION

Commercial tree fruit production is commonly located in areas with at least 150 frost-free days and a USDA hardiness zone of at least 5. These regions provide optimal growing conditions for most tree fruit crops. Idaho's short-season, high-altitude regions do not have the luxury of these ideal conditions. As a result, producing homegrown fruit in Idaho's harshest climates can be challenging, but not impossible.

The main focus in successful tree fruit production is selecting the right crops and varieties. Plant breeding has produced many varieties that will grow in harsh climates. Selecting the right variety is the difference between success and frustration.

Even with adapted varieties, tree fruit production in short-season gardens requires learning and practicing some techniques to ensure that the plants survive and produce.

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- INTRODUCTION 1
- APPLES 2
 - Hardiness and Maturity 2
 - Adapted Varieties 2
 - Management Issues 2
- APRICOTS 3
 - Varieties 3
 - Planting and Pruning 3
 - Watering 3
 - Fertilizing 3
 - Harvesting 3
 - Storage 3



Growing small-fruit crops in short-season gardens

by Stephen L. Love, Ernaeil Fallahi, and Kathy Noble

INTRODUCTION

Small fruit crops are a diverse group and include vine, shrub, and herbaceous (nonwoody) plants. Because these crops have little in common, it becomes difficult or impossible to make universal recommendations for growing them. However, some principles hold true for them all. First, variety selection is critical to consistent performance. Varieties must be both hardy and early maturing. Also, proper planting and maintenance techniques will help the plants remain healthy and productive.

RASPBERRIES

Raspberry varieties are classified as summer-bearing or fall-bearing (fall-bearing varieties develop fruit on one-year-old canes and are ready to harvest in July. These are the hardest varieties and are most likely to survive in short-season gardens.)

CONTENTS

- INTRODUCTION 1
- RASPBERRIES 1
- STRAWBERRIES 2
- CRANBERRIES 3
- CURRANTS AND GOOSEBERRIES 4
- BLEBBERRIES 5
- BLACKBERRIES AND HUCKLEBERRIES 6
- OTHER SMALL FRUITS 6
- SMALL FRUIT CARE 7



Choosing and growing adapted vegetable varieties

by Stephen L. Love, Stuart Parkinson, and Kathy Noble

INTRODUCTION

Growing vegetables in Idaho's short-season, high-altitude regions requires special knowledge and willingness to employ methods and techniques that are not necessary for those living in milder climates. The PNW497 publication, "Short Season Vegetable Gardening" (<http://info.eg.u Idaho.edu/Resources/PCF/SPNW497.pdf>) outlines the general principles of vegetable production in cold climates, including season-extending techniques. This publication supplements PNW497 and provides information specific to selecting and growing the best varieties for Idaho's short-season climates.

These recommendations result, in part, from a survey of preferred vegetable varieties completed in 2006. Gardeners were polled to determine varieties preferred where the production season is limited. Additional sources of information include author experience and published references listing early maturing vegetable varieties.

Fruit and vegetable varieties adapted to short-season, high-altitude climates may be less available in the nursery trade than mainstream varieties. If you are interested in the best varieties, you may need to spend time locating nurseries in early-maturing crops. For many of the best early-maturing varieties, you may need to buy seed and start transplants.

In addition to the variety lists, this publication provides information on growing a vegetable crop to improve the odds of success. This is a comprehensive guide to growing vegetables in short-season gardens.

CONTENTS

- INTRODUCTION 1
- SHORT SEASON VEGETABLE VARIETIES 2
 - Cool-season Hardy Vegetables 2
 - Cool-season Tender Vegetables 3
 - Warm-season Vegetables 3

MAKE A PLAN FOR YOUR GOALS

- Plant Selection
 - Choose what your like to eat?
 - Choose species and cultivars for your environment

MAKE A PLAN FOR YOUR GOALS

- Garden Layout
 - Wide Rows
 - Single Rows
 - Mixed Planting



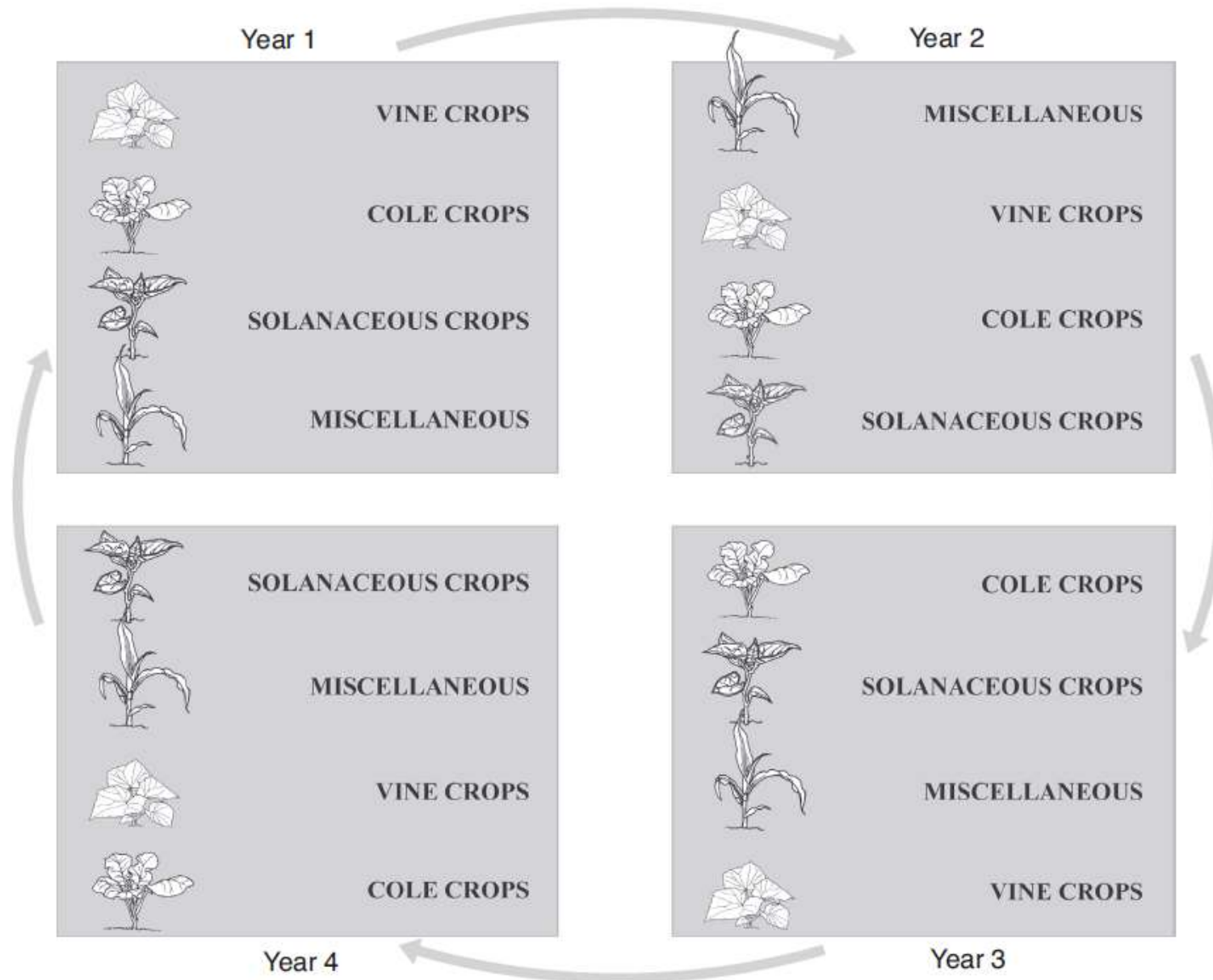
GARDEN SIZE – IS BIGGER BETTER?

- How much space is available?
- Amount of sunshine (6-12 hours)
- How much food do you hope to grow?
- How do you plan to use the harvest?
- Time commitment
- A small weed-free garden will produce more vegetables than a large weedy



Family Planting List	Idaho Master Gardener Handbook Ch. 21			
	For 1 Adult		Actual Amount 2020	
Crop	Lbs.	Feet of Row	Lbs.	Feet of Row
Broccoli (0.75lb/ft)	3-5 fresh 5-6 frozen	4-15	?	12
Carrots (1lb/ft)	5-10 fresh 10-25 frozen/canned	5-35	?	12
Potato	Approx. 60 fresh & stored	5 fresh 30 f&s	?	10
Squash – summer (1.5lb/ft)	6-9 fresh	4-15	?	6

PLANNING: CROP ROTATION



PLANNING FOR SEED SOWING

- Frost Free Date
- Soil Temperature
- Indoors vs. Outdoors



IDAHO GREEN THUMB
HOW-TO'S



at a glance

University of Idaho Extension BUL 965
www.extension.uidaho.edu/idahogardens

Spring Vegetable Planting Guide for Idaho

**SPRING VEGETABLE PLANTING
GUIDE FOR IDAHO**

UI EXT BUL 965

Crop	Zones 3-4			Zones 5-6		
	Start Indoors	Transplant Outdoors	Start Outdoors	Start Indoors	Transplant Outdoors	Start Outdoors

Cool Season						
-------------	--	--	--	--	--	--

Beets			5/15-6/5			4/27-5/18
Broccoli	4/17-5/1	5/8-5/29		3/30-4/13	4/13-5/11	
Brussels sprouts	4/17-5/1	5/1-5/22		3/30-4/13	4/13-5/4	
Cabbage	4/3-4/17	5/1-5/15		3/16-4/30	4/13-4/27	
Carrots			4/24-5/8			4/6-4/20
Cauliflower	4/17-5/1	5/1-5/15		3/30-4/13	4/13-4/27	
Collards	4/17-5/1	5/1-5/22		3/30-4/13	4/13-5/4	
Kale	4/17-5/1	5/1-5/22		3/30-4/13	4/13-5/4	
Kohlrabi			5/1-5/22			4/13-5/4

Propagating Plants from Seed

A PACIFIC NORTHWEST EXTENSION PUBLICATION • PNW0170



PROPAGATING PLANTS FROM SEED PNW 0170

Table 2. Suggestions for successful propagation of common vegetables from seed and vegetative propagules.

Vegetable	Seeds		Distance				Soil temperature for seed*			Weeks to grow to transplant size†	Days to maturity‡
	Depth to plant (inch)	No. to sow per foot of row	Between plants (inch)	Between rows (inch)			No. days to germinate	Needs light to germinate	Needs cool soil		
Asparagus	1½		18	36	7-21	—		•		1 year	3 years
Asparagus Lettuce	½	8-10	12	18	4-10	—		•		4-6	80
Beans: Snap Bush	1½-2	6-8	2-3	18-30	6-14	—			•		45-65
Snap Pole	1½-2	4-6	4-6	36-48	6-14	—			•		60-70
Lima Bush	1½-2	5-8	3-6	24-30	7-12	—			•		60-80
Lima Pole	1½-2	4-5	6-10	30-36	7-12	—			•		85-90
Garbanzo											
Chick Pea	1½-2	5-8	3-4	24-30	6-12	—			•		105
Scarlet Runner	1½-2	4-6	4-6	36-48	6-14	—			•		60-70
Soybean	1½-2	6-8	2-3	24-30	6-14	—			•		95-100
Beets	½-1	10-15	2	12-18	7-10	—		•			55-65
Buck-eye Cowpea	½-1	5-8	3-4	24-30	7-10	—			•		65-80
Southern Peas											
Yardlong Bean	½-1	2-4	12-24	24-36	6-13	—			•		65-80
Broccoli, sprouting	½	10-15	14-18	24-30	3-10	—		•		5-7**	60-80T‡‡
Brussels Sprouts	½	10-15	12-18	24-30	3-10	—		•		4-6**	80-90T‡‡
Cabbage	½	8-10	12-20	24-30	4-10	—		•		5-7**	65-95T‡‡



MULCHING

- Retains moisture in the soil
- Helps limit weeds



MULCH

- Leaves
- Straw
- Wood chips
- Bark mulch
- Plastic mulch
- Cardboard
- Newspaper



HARVESTING

- Harvest at the appropriate maturity stage.
- Harvesting and Storing Fresh Garden Vegetables UI Ext BUL 617





HANDLING/ VEGETABLE PREPARATION

- Be gentle, bruising leads to rot
- Select only your best produce for storage
- Curing
 - onions, garlic, squash, pumpkins and sweet potatoes need curing



**FRUIT
TREES**

FRUIT TREE SELECTION

Usual Order of Bloom in Fruit Trees	
Apricots	Earliest
Japanese Plums	↓
Peaches	
Oriental Pears	
Italian Plums	
Cherries	
Pears	
Apples	Latest

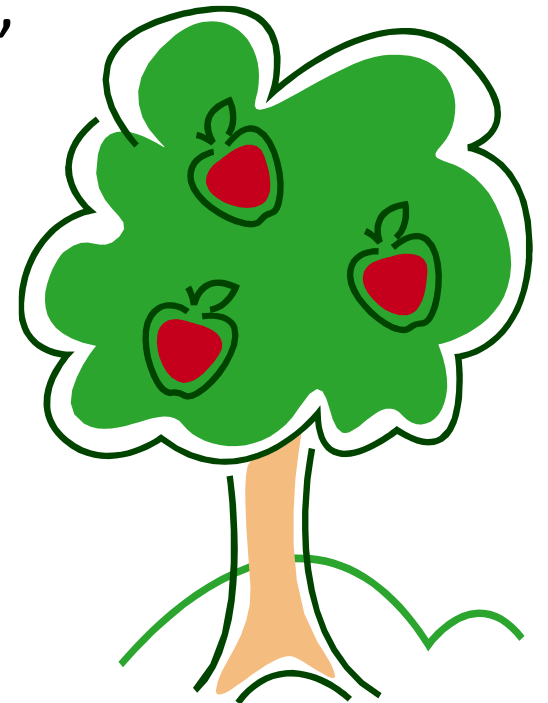
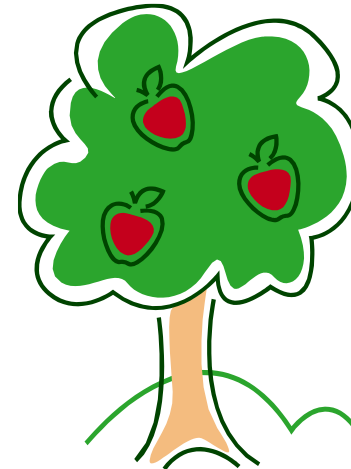
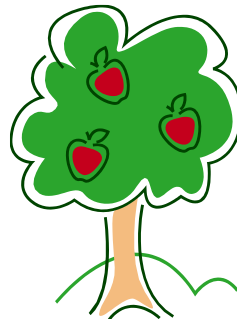
Hardiness of Fruit Trees		
Peaches		Least Hardy
Japanese Plums		Less Hardy
Sweet Cherries		Less Hardy
Oriental Pears		Less Hardy
Apricots		Moderately Hardy
Sour Cherries		Consistently Hardy
Pears	Zone 4	Consistently Hardy
Italian Plums	Zone 3	Consistently Hardy
Apples	Zone 3	Consistently Hardy

ROOTSTOCK



- Apples

- Bud 9 – very hardy, adaptable, 8-10', dwarf, stake or trellis
- M26 and M9 – 7-10', dwarf, stake or trellis, M26 needs well-drained soil.
- M7 – hardy, suited to heavier soils, 10'-12', semi-dwarf, free standing. CG30 reported to be a replacement.
- MM111 – 18-20', semi-dwarf, resistant and aphids.

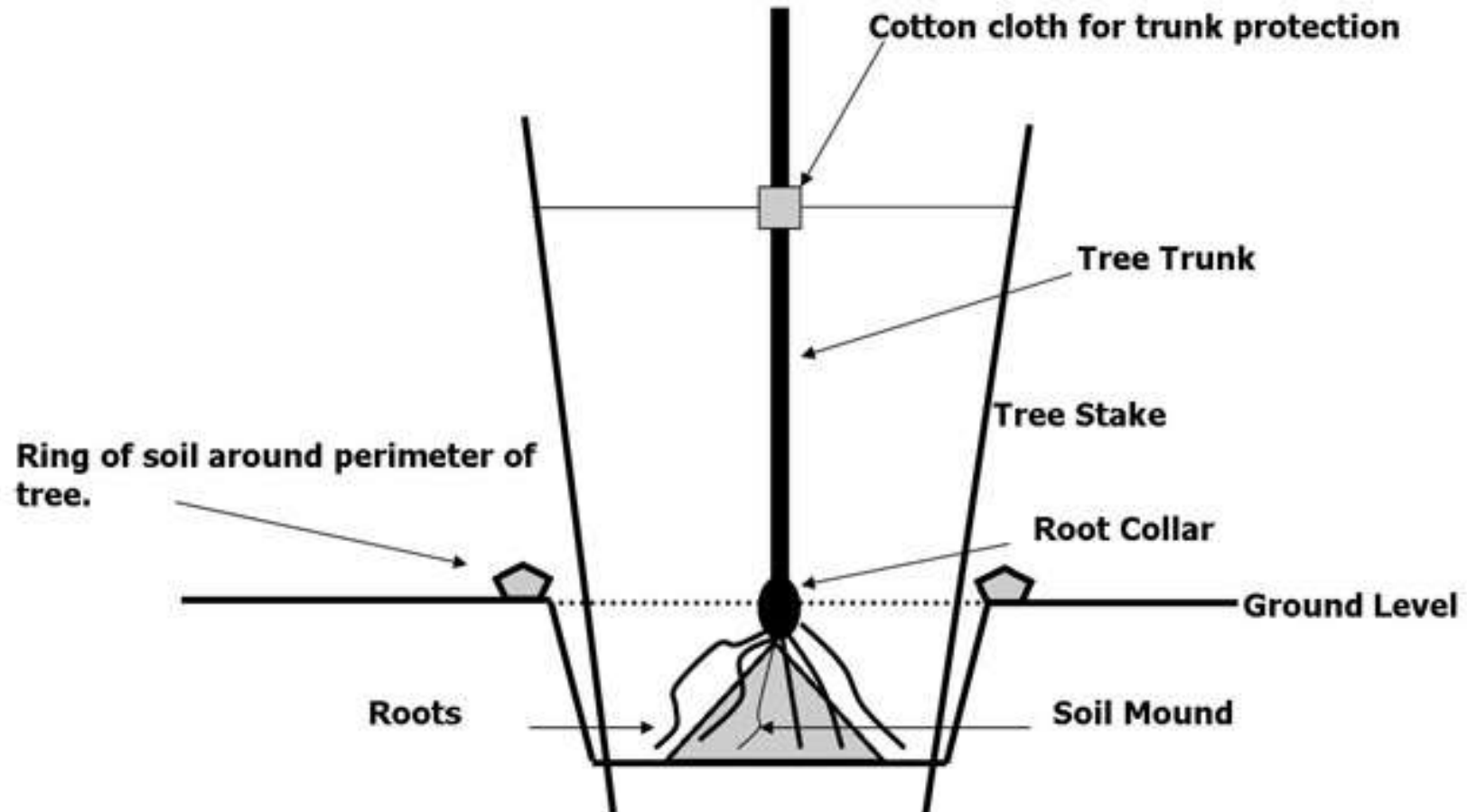








PLANTING



WATER MANAGEMENT

- Newly set trees with limited root systems or plants damaged by cold injury, diseases, or insects are more susceptible to moisture stress.
- Good soil drainage is important, especially in the spring.
- Fruit trees have deep root systems, most of the roots are concentrated in the upper 2' of soil and extend slightly beyond the drip line.

FERTILIZATION

- The amount of N to apply depends on tree productivity.

Table 2. Recommended annual terminal growth of fruit trees.

Nonbearing trees

Apple	24 to 36 inches
Pear	12 to 26 inches
Peach and other stone fruits	16 to 24 inches

Bearing trees

Apple	12 to 14 inches
Pear	6 to 12 inches
Peach and other stone fruits	10 to 15 inches



FERTILIZATION

- Too little fertilization reduces growth rates, fruiting wood, and crop yield the following year.
- Too much fertilization will cause too much vegetative growth and a poor crop.
- Starting a fertilizer program:
 - Use 1/8 lb. of actual N per inch tree diameter for stone fruits.
 - Use 1/10 lb. of actual N per inch tree diameter for pome fruits.



SMALL FRUITS

- Blueberries
- Strawberries
- Raspberry
- Blackberries
- Others



Photo: Shingle Mill Blueberry Farm

SMALL FRUITS

- Blueberries
- Strawberries
- Raspberry
- Blackberries
- Others



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American Chestnut > PDF
Whether you are planning one American chestnut in your yard or planning to establish a plantation with hundreds of trees, there are some basic planning, planting and maintenance activities you should [more details](#)



Apple Scab > PDF
Particularly troublesome where rainfall and relative humidity are high, and under overtree irrigation, apple scab can defoliate trees and blemish fruit to a point where it is unmarketable. Learn the s [more details](#)

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IS A MARKET GARDEN IN YOUR FUTURE?

- **Market Resources**

- Are you located close to markets?
- Is demand present?
- What is your competition?
- Where is your niche?
- What potential exists for further expansion/new products?



IS A MARKET GARDEN IN YOUR FUTURE?

- **Human Resources**
 - Skills and Experience
 - Farming
 - Running a business
 - Personal and Family Interest
 - Other Labor Resources





IS A MARKET GARDEN IN YOUR FUTURE?

- **Financial Resources**

- Current financial capital
- Potential for loans
- What do you have in mind...

IS A MARKET GARDEN IN YOUR FUTURE?

- **Financial Resources**
 - What can you afford



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At Affinity Farm, a small 5-acre farm within the city limits of Moscow, Idaho, Russell Poe and Kelly Kingsland grow some 40 varieties of vegetables. They are among the first each season with produce t [more details](#)



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This publication offers information for the alfalfa grower on various parasitic nematodes that affect their crops. It covers the distribution, life cycle, symptoms, impact, and management strategies f [more details](#)

THANK YOU!

- Jennifer Jensen
- jenjensen@uidaho.edu

