

## Small Acreage Site Inventory Factors to Consider in Planning a Small Scale Agricultural Enterprise

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### Introduction

Recent population growth in Utah has resulted in fragmentation of farm land, and an increase in small-acreage land parcels. Agricultural enterprises on these small-acreage land parcels can range from part-time hobby farms to full-time businesses. Options range from high-input high-value horticultural crops to minimally managed pasture. Determining the best crop or crops for your small-acreage farm involves considering a number of factors. This publication is intended to provide a step-by-step guide for taking an inventory of the factors that should guide the decision in what type of small acreage enterprise to pursue. Careful planning before deciding on a crop will help ensure a successful venture.

### Climate

Climate is one of the most important considerations for selecting an appropriate crop. The type of crops that can be grown, cultivar selection, and freeze protection needs will vary depending on your specific climate. The most important climatic factors to consider in selecting an appropriate crop are: average coldest winter temperature, average last spring freeze, average first fall freeze, and the length of the freeze-free season. The Utah Climate Center at Utah State University maintains a website, <http://climate.usu.edu>, with access to current and historic data from weather stations throughout Utah.

Average coldest winter temperature is used in determining cold hardiness zone, a standard used to determine which plants will survive the winter. Average last spring freeze is important in determining how early to plant cool-season vegetables. It is also important in determining which perennial fruit crops might be suitable.

Average first fall freeze will be a good indicator for when the growing season ends and when some fruits and vegetables will need to be harvested. Use the average first and last freeze dates to determine the number of freeze free days you can expect in your climate.

### Site

Microclimates are zones that vary from the surrounding area's overall climate. Microclimates can have a large effect on the type of conditions your crop will experience. The slope of the land, as well as the direction it is sloping (aspect) will affect microclimate. A south-facing slope will often warm sooner in the spring than flat ground and may mean fruit trees begin blooming earlier than surrounding areas. However this can result in increased risk of damage from late spring freezes. A north-facing slope delays spring warming and can move bloom and planting time later. Planting crops on a hill sufficiently higher than the surrounding area can help avoid freeze damage to sensitive plants, as the cold air will flow down the hill and settle at lower elevations. Conversely, if your land is at the bottom of a valley it will be more prone to late spring and early fall freezes. Usually an area elevated at least 50 feet above the valley floor will provide some protection during temperature inversions typical of Utah's high mountain valleys. Nearby bodies of water also moderate temperatures, as will buildings or large stands of trees that act as windbreaks. Proximity to canyons, with their typical winds, can dramatically affect the micro-climate of your land. Small automated temperature recorders can be extremely useful in determining microclimate conditions, and for comparing your site to the closest weather station.

**Table 1. Salinity tolerance and seasonal water use of common crops grown in Utah.**

Crop	Damage Threshold EC <sup>a</sup>	10% yield loss	Tolerance rating <sup>b</sup>	Seasonal water use (inches)
Bean	1	1.5	S	16
Strawberry	1	1.3	S	30
Raspberry	1	1.4	S	28
Onion	1.2	1.8	S	24
Lettuce	1.3	2.1	S	13
Grape	1.5	2.5	S	15
Corn	1.7	2.5	S	22
Potato	1.7	2.5	S	17
Peach	1.7	2.3	S	38
Apple	1.7	2.3	S	33
Alfalfa	2	3.4	MS	28
Tomato	2.5	3.5	MS	22
Spinach	3.7	5.5	MT	12
Squash	3.9	4.9	MT	28
Trefoil	4	6	MT	23
Wheat	4.7	6	MT	18
Oats	5.2	6.7	MT	18
Barley	8	9.6	T	22

<sup>a</sup>Electrical Conductivity in dS/m.

<sup>b</sup>T = Tolerant, MT = Moderately Tolerant, MS = Moderately Sensitive, S = Sensitive

## Soil

Knowing the soil characteristics is also important in determining the appropriate crop and associated management practices. The important soil parameters to consider include: pH, texture, drainage, salinity and organic matter. Soil pH is the measure of acidity or alkalinity, which affects the availability of nutrients to the plant. Most soils in Utah are alkaline (pH level above 7), which limits the crops that will grow well. Soil texture will influence water holding capacity, nutrient holding capacity, as well as drainage of excess water and aeration. Heavy soils (high in clay content) will not drain quickly and may be water-logged in the spring. Soils that do not drain adequately may need to be formed into raised beds or have drain tiling installed. Sandy soils drain very quickly and irrigation events will need to be more frequent during the hot summer months. Organic matter is a good indicator of soil health. Organic matter in the soil improves nutrient and water holding capacity and reduces compaction issues. Many fruit and vegetable crops are sensitive to high salinity and if your soil has high saline levels, reclamation action may be needed. Another option would be to plant more salt tolerant crops. See Table 1 for a list of crops and their tolerance to saline soil. Submitting a soil sample for testing is easy and relatively inexpensive. Visit <http://usual.usu.edu> for more information on getting your soil tested.

## Water

Irrigation water is an important consideration in crop selection. There are four basic points to consider for irrigating your crop: quantity required, availability across the season, quality, and cost. The three main sources for irrigation water are city, secondary surface (canals), and well water. Each source has advantages and limitations, and depending on availability and crop needs, you may use one or a combination of the three sources during the growing season.

**Quantity:** Crops vary in water requirements. Table 1 shows seasonal water requirement in inches for a number of crops. Weekly water requirements will vary by crop with peak water corresponding with the hottest weeks of late summer.

**Availability:** First, determine which of the three types of irrigation water are available. In Utah's semi-arid climate, it is critical that at least one of the three irrigation methods be available throughout the growing season, as typical rainfall levels are not sufficient to meet plant needs. Second, determine what time of year each source is available. City water is typically available throughout the year. Well water may or may not be available throughout the year, as overtaxed wells can dry up late in the summer. Additionally, some well water rights do not allow the use of the water for extensive irrigation of crops. Secondary surface water is one of the least expensive options, but has some limitations. Surface water may not be available early enough in the spring, or late enough in the fall, depending on when water is put into the canal. In some cases, secondary water is intended for grain crops and is not available after mid-summer. Determine the typical number of weeks you have secondary water available and what time of year.

**Quality and cost:** City water is typically much more expensive per unit than secondary and well water, but it is available throughout the year and is usually high quality. Well and secondary water are less expensive per unit, but have more limited availability than city. Particularly for saline and alkaline soils, the level of salt and pH in the water can be an important parameter to consider. For city water, check with your local municipality for publically available water test results. Samples of secondary and well water can be submitted through the same service as soil samples ([usual.usu.edu](http://usual.usu.edu)). Irrigation companies often test secondary surface water, and make those results available to share-holders. The cost of distributing the water should also be considered. There is a wide variation in cost from simple flood irrigation to filtered, drip irrigation.

## Labor Availability

A critical consideration for any farming operation is where the labor will come from. There are many facets to running a small farming operation, often requiring multiple skill sets. It is important to determine the amount of time you have to devote to the operation throughout the season. Be realistic with your expectations, taking into account current employment, health and family obligations. For some growers and for some crops, willing family members or hired labor will be key in a successful operation. Realistically evaluate local labor availability and competitive hourly wages in planning your small acreage enterprise. Remember that high value horticultural crops such as fruit and vegetables are much more labor intensive than a low-input system like pasture.

## Economic Considerations

**Market:** The most bountiful and beautiful harvest is of no value if you do not have a ready market. Determine your target market early in the planning stages. There are several market options available to small acreage growers. Farmers and Gardener' markets are gaining in popularity and can be a great way to find consumers for your product. Other direct sales options include roadside-stands, community supported agriculture (CSA), and pick-your-own (PYO). Direct markets may not result in selling everything produced and require time to build a customer base. Additionally, someone needs to physically be at the stand/market to sell the produce, increasing labor hours needed. Selling to wholesale

markets has less return to the grower than direct market sales, and is typically not available to small-acreage producers who cannot meet wholesale volume requirements.

**Income expectations/needs:** The amount of income generated from your land will vary widely between crops and in some cases, years. Some growers plan on growing simply as a hobby, and others view it as a main or supplemental income source. Determine what amount of income you need to generate from your farm. Knowing the amount of revenue needed each year should be factored into deciding what crop you will grow.

**Capital investment:** Determine the amount of capital investment you have. Fruit trees do not start yielding a full crop for 3 to 5 years. Pastures will need an establishment year before heavy mowing or grazing, and will require investments in fencing or forage harvesting equipment. Mixed vegetables will yield well the first year, but are highly labor intensive and perishable. No matter the crop, you will need to have enough initial capital to keep the operation running until production begins. Developing a realistic business plan, including equipment, supplies, markets and pricing are all key to identifying the appropriate crop(s) for your small-acreage endeavor.

The worksheet on page 4 will assist you in taking an inventory of the factors discussed above.

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# Considerations

## Climate (visit [climate.usurf.usu.edu](http://climate.usurf.usu.edu))

Average lowest temperature	_____	°F
Average highest temperature	_____	°F
Last Spring freeze	_____	Day
First Fall Freeze	_____	Day
Number of freeze-free days	_____	Days

## Site

Slope	_____	%
Aspect (i.e. North-facing)	_____	
Low spots (potential frost pockets)	_____	
Microclimate factors (windbreaks, shade, etc.)	_____	

## Soil (submit sample at [usual.usu.edu](http://usual.usu.edu))

Texture	_____	
pH	_____	
Salinity	_____	dS/m
Organic matter	_____	%

## Water

Type (city, secondary, well)	_____	
Time period available	_____	
Amount	_____	inches
Salinity	_____	dS/m
pH	_____	

## Labor Availability

Owner hours available per week	_____	hours
Hired hours	_____	hours

## Economic

Target market (Wholesale, PYO, Farmer's Market, Road Side Stand)		
Primary	_____	
Secondary	_____	
Capital investment (equipment, establishment)	_____	dollars
Background/Experience	_____	

