SUSTAINABLE FOOD GARDENING:
RIGHT PLANT, RIGHT PLACE, RIGHT TIME

by Master Gardener Stephanie Wrightson

Planting the right plant in the right place is an important sustainable gardening practice in any landscape. But, when food gardening, the right time also is essential. While there are perennial food crops, most of our home grown crops are annuals requiring either warm or cool weather to thrive and mature.

GENERAL CHARACTERISTICS OF VEGETABLE AND FRUIT CROPS

There are two broad categories of food crops: cool season and warm season. Within the cool season crop category are those that are "semi-hardy" or "cold-hardy." Some warm season crops require extra warmth, including minimum evening air temperatures for best production. Every crop has its own ideal soil and air temperature ranges for optimum germination and growth, but there are common characteristics within each category.

Vegetable Crops

- Cool season crops are crops that grow best when started (especially when seeded) in soil temperatures of 60 to 65 degrees F and air temperatures of 65 to 75 degrees F. They mature best in cool fall temperatures. Cool season transplants can withstand lower soil temperatures (to 40 degrees F).
  - "Semi-hardy" crops are those that survive a light frost (predictions of 36 degrees F indicate the potential for light frost).
  - "Cold-hardy" crops can survive a heavy freeze and will overwinter during a normal Sonoma County winter if brought to maturity or near-maturity in the fall (most overwintering crops will survive at approximately 25 to 28 degrees F).
- Warm season crops are crops that grow best in soil temperatures of 65 to 80 degrees F and air temperatures of 65 to 95 degrees F with little cooling at night.
  - Some warm season crops (e.g., many crops in the *Solanaceae* family such as tomatoes, eggplants and bell and chili peppers) need extra protection to keep them warm if planted early in the season. Low night temperatures (generally below 55 degrees F) can have a detrimental effect on these crops' overall growth and production.

Two UC Master Gardener Program of Sonoma County publications indicate which crops are cool season and which are warm season along with planting windows for Sonoma County: "Vegetable Planting Summary" and "Year-Round Food Gardening in Sonoma County." Actual direct seeding and transplanting dates will depend on your particular

growing conditions and microclimate[1]. Due to climate change, Sonoma County is expecting hotter days, more flooding and unpredictable weather events. Pay close attention to weather forecasts in order to determine the best planting windows for your food crops.

Fruit Crops

Whether you are planting a home orchard or a single fruit tree, select fruit varieties that are suited to your area's chill hours (the number of hours below 45 degrees F). Each fruit tree variety requires a certain number of chill hours in the winter to break dormancy in a normal manner. Consider planting the main temperate tree fruit and nut crops grown commercially in Northern California: apple, pear, prune, olive, and English and black walnut—as well as grapes. Reference the University of California's The California Backyard Orchard website and "Growing Temperate Tree Fruit and Nut Crops in the Home Garden" for more information about fruit tree requirements. Berry and grape requirements can be found on the University of California's The California Garden Web. Also, see fruit and berry articles on the UC Master Gardener Program of Sonoma County's website.

Right plant, right place, and right time are separately addressed below but, in reality, all three are inextricably entwined.

RIGHT PLANT

The right plant is one that is seasonally suited for your growing conditions and microclimate, and is a crop that you and your family like to eat. Obviously, a food gardener in Cloverdale and one in Bodega have significantly different growing seasons and conditions. A gardener in Cloverdale, with its long, hot summer, should be able to bring a large late variety tomato to maturity whereas a Bodega gardener might select an early season variety that does well in coastal weather. While the Cloverdale gardener may experience an abundant harvest from warm weather crops, the Bodega gardener with a coastal climate and milder winter may have very productive leafy greens in fall through the following spring.

The location (right place) and timing (right time) of planting informs the crop and variety selection (right plant). Every crop has a certain number of daylight (sunlight) hours needed to mature; some crops grow and mature best in warm weather while others prefer to start in warm weather but mature best in cool weather. And, every crop variety

[1] Microclimate refers to local variations from the general or regional climate resulting from slight differences in elevation, direction of slope exposure, soil, density of vegetation, etc. ("California Master Gardener Handbook," University of California, Agriculture and Natural Resources)

has a days to maturity (aka days to harvest) period that must be taken into consideration—can a particular variety be direct seeded or transplanted and brought to maturity before the end of the growing season?

It is important to include plants that attract bees and beneficial insects for pollination and to fight pests. These are always “right plants” in a food garden. In addition to planting flowers, allow some of your spent crops and herbs to flower. See “Sustainable Food Gardening” for more information.

RIGHT PLACE

The right place is dependent on microclimate and growing conditions as well as the choices a gardener makes regarding bed location/orientation. Right place is also a consideration at a micro level when determining the relationship of individual plants to each other (i.e., the bed’s planting scheme).

Location and Orientation

Locate the food garden bed where vegetables will receive adequate sunlight. Leafy greens and many other cool weather vegetables require at last three to four hours of sunlight but more is ideal. Warm season vegetables (that produce “fruit”) require at least six to eight hours of sunlight during the late spring and summer months although full sun is ideal. When light requirements are not met, plants are stressed and are more susceptible to pests and disease, and production will fall below expectations.

All food crops need good drainage—do not place beds in low areas that collect water. Try to avoid cold spots—cold air flows downhill and collects in depressions. Be aware of reflective heat (e.g., from south facing walls, rocks) that may provide extra warmth or frost protection. Avoid structures such as large trees that reduce light or invasive roots that compete for nutrients. Your bed should be accessible (e.g., near your kitchen or, at least, within reach of irrigation).

There are a number of opinions about how to orient your bed. But sometimes your space, or lack thereof, determines orientation. The most common orientation is east to west, planting tall crops on the north or west side so as not to block sunlight. However, if the garden slopes, you can run the beds north and south so that both sides get equal sunlight (this is especially important for a sloped winter garden).

Whatever the orientation, the most important things to know are 1) how much daylight the bed receives in each season, 2) from what direction does the space receives daylight throughout the day, and 3) how crops are placed in relationship to each other to either take advantage of the sun or the shade that a tall plant can create.

Crop Placement in the Bed

Use crop placement in the bed to benefit plants, especially when transitioning from one season to another. For example, use the shade of tall or trellised warm season vegetables to shield your cool season seedlings from the hot afternoon sun in August and September; or experience an extended harvest of spring-planted lettuce when it is planted with asparagus that produces tall, bushy ferns during the hot summer and that provide dappled shade. In some cultures, there are long-practiced planting combinations such as “the three sisters” where corn, pole beans, and squash are planted together. The corn, as it grows, provides support for the climbing beans; the beans fix atmospheric nitrogen in the soil for the benefit of all; and the large leaves of the sprawling squash becomes a living mulch that shades the soil for moisture retention and weed suppression. The prickly squash leaves also are a deterrent to some vertebrate pests. In this combination, these plants are in the right place.

Water Needs and Soil

Right place may involve planting crops with similar watering needs near each other, especially if using drip irrigation in the food garden. Right place also involves the soil—providing the best possible growing conditions for optimum production. See “Sustainable Food Gardening” for more information about irrigation and conserving water and nurturing and protecting the soil

RIGHT TIME

Accurate timing is a prerequisite for an abundant harvest. It is a matter of determining the intended harvest date and, then, working backwards from the intended harvest date to determine when crops should be direct seeded or transplanted.

What do we need to know in order to start our crops at the right time?

1. HOURS OF DAYLIGHT. Plants grow unperceptively or stop growing when there is less than 10 hours of daylight. The time period with less than ten hours of daylight differs based on latitude, and may vary slightly each year—perhaps by a day. To find

this period's date range for your latitude, enter your zip code, month (November or January) and year on the sun calculator page of timeanddate.com.[2]

2. THE FIRST AND LAST AVERAGE FROST/FREEZE DATES. The past may not always be a predictor of the future but it can be helpful for planning purposes. NOAA produces average last and first frost/freeze dates based on 30 years of past weather data for every weather station. In addition to this data, consider the current year weather prediction and your own microclimate.
3. THE CROP'S COLD-HARDINESS OR WARMTH REQUIREMENTS. See the information and document links in the "General Characteristics of Vegetable and Fruit Crops" on page 1. A reliable west coast gardening reference or an Internet search will provide more detail for individual crops.
4. DAYS TO MATURITY[3]. Find the days to maturity (or days to harvest) on the seed packet or plant label (or, if necessary, search the Internet). If you cannot bring a particular variety to maturity during the growing season, it may be necessary to select a different variety with shorter days to maturity (e.g., a baby Japanese turnip variety may take 30 days to mature vs. a standard turnip variety with 75 days to maturity).
5. THE SEASON. A variety's days to maturity reflects an optimal planting environment (i.e., spring seeding or transplanting as the days are getting longer and warmer). If a cool season crop is direct seeded in the fall rather than in spring, add 7 to 14 days to the days to maturity to account for the crop maturing during shorter days and cooler weather.

Apply this information to make maximum use of Sonoma County's growing seasons. Plant a cool season crop such as lettuce in the spring followed by a warm season crop such as string beans, and finish with another cool season crop in the fall (ideally a crop that will overwinter such as spinach). Planning (right plant + right place + right time) = year-round food gardening.

This article is one of a series of articles about Sustainable Food Gardening.

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[2] Because Sonoma County latitudes and yearly date fluctuations are slight with regard to day length (often a day's difference at most), most Sonoma County gardeners would not go wrong using November 18 and January 23 as the last and first dates of ten hours of sun when planning planting dates.

[3] Days to maturity begin when the crop "hits the soil"—that is, when it is direct seeded or transplanted in the garden bed. But it is not quite that simple. Some crops are either direct seeded or transplanted. Other crops may be planted using either method, but the days to maturity applies to the usual planting method. See "Year-Round Food Gardening in Sonoma County" which indicates crops as "D" (direct seeded) or "T" (transplanted). If "D/T," the plant is usually direct seeded; if "T/D," the plant is usually transplanted. If you transplant a crop that is usually direct seeded, subtract the germination days from the days to maturity. If you direct seed a crop that is usually transplanted, add the germination days to the days to maturity.