

Planning and Managing a Vegetable Garden

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Choosing the site

- A garden requires full sun throughout the day (minimum of 6 hours); fruiting vegetables such as tomatoes, peppers, eggplants require 8 hours of sun. Leafy vegetables and root crops can tolerate part shade. Shade tolerant plants are usually the non-fruiting variety (can be planted between taller plants).
- A southern exposure warms up earlier in the spring and receives more hours of sunlight and solar gain during the day
- Good drainage
- Access to water
- Air drainage (frost pockets)/ wind protection or other microclimates? Ask your neighbors if you are new to that area of town
- Proximity to house, or daily route

Planning the garden. Plan on paper; plan to scale, i.e. 1/4" equals 1 foot. This will help you determine how much seed and how many transplants are needed. Graph paper works well for this. Locate north as it relates to your garden plan.

- **Orient** the rows going north and south to maximize sunlight
- **Mode of cultivation.** Rows to be hand cultivate can be planted closer together than those to be machine cultivated
- **Tall crops**, such as corn, pole beans, pole peas, etc. should be planted on the north end of the garden to prevent shading of lower growing plants. **Corn is wind pollinated** so it must be planted in no less than 4' blocks. Plant 3-4 rows wide, and not in a single row.
- **Perennials** such as asparagus, rhubarb and strawberries should be planted to one side where they won't be disturbed by annual tilling.
- **Flowering plants** will attract the necessary pollinators and beneficial insects. Include flowers in different locations throughout the vegetable garden.
- **Group** early-maturing plants (spinach, lettuce, radish) together so that after harvest this ground can be fertilized (if indicated by a soil test) and replanted to crops that mature later.
- **Get a soil test done from a lab.** This will tell you the best way to prepare the soil and give you a baseline for nutrient management. Many areas of town do not need the fertilizer we assume is depleted.

Keep a journal- Record your thoughts and observations throughout the growing season, (you won't remember). Include your map. This will prevent you from repeating mistakes or planting the same thing in the same place each year, which can contribute to pathogen buildup in the soil. Crop rotation is accomplished on a 4 year (or longer) cycle.

Garden size- How much area can be converted into useable garden? **Raised bed or rows?**

- Who will be doing the work? A small, weed free garden will produce more than a large, messy garden. Keep it manageable.
- Are you planting for fresh use only or do you want enough to can, freeze or otherwise preserve? A well planned **30' X 30'** garden will provide fresh vegetables for a family of four. For food preservation, you will need a space twice that large.
- **Double rows-** Small crops such as radish, can be planted double row, 6" apart. Bush beans can also be planted in double rows for support.

- **Wide row-** Small seeds such as lettuce, can more easily planted in a wide row. A salt shaker works well to scatter small seeds.
 - **Shade tolerant crops** can be planted between tall plants
 - **Tomatoes/ determinate or indeterminate;** More space is required for indeterminate since the green vines grow continuously all summer.
 - **Pumpkins, squash vines** require 5'-12' area per plant (some new varieties require less space).
 - **Melons, some squash and corn** require large land areas in relation to their edible yield
 - **Other crops produce overwhelming yields** in relatively small gardens, i.e. beans, tomatoes, zucchini
- If space is limited you may opt to buy corn, squash, etc at the Farmer's Market's or elsewhere

Weed control- Begin with a weed free place. This can be done manually, chemically or mechanically. This takes time to reduce the established seed bed. Weed seeds can be dormant for many years. It is better to spend more time managing weeds before you begin, than dealing with the seeds bed after you have planted.

- Manually- hand weeding, hoe
- Chemical- get the weed correctly identified by our Plant Diagnostic Clinic before using a synthetic or organic control method. Some seeds are resistant to certain chemicals and our goal is to reduce the application of all chemicals, organic or synthetic. Glyphosate, a non-selective herbicide, active on all green, growing material, is safe to use before garden is planted per the label. Process- spray the weeds when they have enough foliage to absorb the spray. Wait at least 12 days for the chemical to translocate to the roots. Let new weeds re-sprout; when they are about 2"-3" tall spray again. Wait at least 12 days. Let weeds re-sprout one more time, and spray again when they are 2"-3" tall. Wait at least 12 days. You now have gotten rid of most of the seed bank in the top few inches of the soil. Do not till after this point, you will expose dormant weed seeds. Follow the label instructions for the time-frame to replant.
- Mechanically - Roto-tiller method-till 6" deep and let weeds re-sprout. When 2"-3" tall shallow roto-till, no more than 2" deep. Let weeds re-sprout, and shallow till one more time no more than 2" deep. You have now gotten rid of the seed bank in the top 2" of the soil. If you deep roto-till you will bring up more seed. Some seeds can remain viable in the soil for eighty or more years.

Preparing soil for planting- Spread compost or aged manure on top of soil per your soil test. Work the soil to a depth of 6-8" when soil is slightly damp. All fertilizers except nitrogen should be added and mixed in the soil while tilling. After tilling, the garden should be raked several times in different directions while soil is still soft and moist. Do not walk directly on soil. Place boards, carpet or other material to walk on to prevent soil compaction.

Adding organic matter to amend the soil if your soil test indicates –We are looking for 3% - 5% of the soil to be comprised of organic matter. Compost is the amendment to add in most situations. It is the only soil structure that has the capacity to hold water and nutrients for plant roots. Other good options (though not a replacement for compost) are well-rotted manures (one year out of the animal, not containing high sale levels) peat humus or peat moss, completely decomposed sawdust, or ground bark if indicated by a soil test. Un-decomposed woody products will tie up the nitrogen in the soil while decomposing if tilled in. Additional applications of nitrogen will be needed to compensate.

If you have enough space, planting cover crops builds up soil very rapidly, usually in one season. You can plant the entire garden or alternate ½ one season, other ½ the next season.

Three methods of applying fertilizer after you have received results of your soil test:

- **Broadcasting,** self-explanatory. Fertilizer is spread over soil before planting and worked in with a spade or roto-tiller. Fall is a good time to incorporate rock powders such as rock phosphate (P) and greensand or rock granite (K)

Rate: depends on what the soil test indicates.

- **Banding.** Narrow bands or furrows are placed 2-3" from seed row on both sides of the row and 1-2" deeper than seeds are planted.
- **Side dressing.** After plants are up and growing, scatter fertilizer on both sides of row, 6-8" from plants. Rake into soil and water thoroughly.

NPK – Listed on each bag of fertilizer. **Nitrogen** contributes to green leafy growth. Too much and plants will get lots of green, leafy growth at the expense of the fruit. Corn (a grass) needs nitrogen at the onset of the season, but not for long. N moves readily in the soil (mobile) and must be replaced often. **Phosphorus** kicks in the blooming/fruitletting mechanism in plants. Good for fruit bearing plants. Too much phosphorus kills essential microorganisms in the soil. **Potassium** contributes to root and stem strength and health. Good for root crops if indicated.

Do not assume your plants are depleting the soil of nutrients. That is not the case in most healthy gardens. A soil test is always recommended as a baseline.

Watering - Natural precipitation is not enough. Supplemental irrigation is necessary. Make sure the supply is adequate and dependable. If water is limited, plant more drought tolerant plants.

- Drip irrigation- most efficient. Uses a system of plastic tubing with tiny holes that release water slowly for plants at the root zone.
- Sprinklers- More efficient than surface irrigation. Leads to many disease pests. We do not suggest overhead watering for vegetable gardens.
- Surface irrigation- requires that furrows be within 12-18 inches of the plants so water can move through the soil into the root zone of the plant. If used on sloping areas, make furrows and planting on the contour to prevent erosion caused by water running down the hill into the furrows. Compost is an essential element for this method in order to retain the water in the soil.

Insect control – You will always have insect pests in the garden. If you do not have the pests (food sources) you will not have beneficial insects and pollinators. Try to identify your threshold for insects in the garden. Learn if you can extend that threshold to attract nesting beneficial insects. Insect monitoring, remay (row cover) or other cover cloth is used to interrupt the life cycle of the cabbage moth, leaf miner and other insects, paper collars, hand picking and several organic insecticides are on the market. Beware of scams, i.e. two block bug killer. Organic and synthetic controls are considered chemicals. Even organic controls are harmful to beneficial insects and insect pollinators. Some organic controls are harmful to humans and pets if the label is not followed correctly. Check with our Plant Diagnostic Clinic in our office to identify which pest you are dealing with and which control method (chemical, mechanical or cultural) is best.

Disease control - Avoid watering at night. Water so that foliage does not remain wet for extended periods of time. Don't over-crowd plants. Make sure the water is percolating into the root zone. If it is extremely dry, water will move sideways, not down. Pick bottom leaves from tomatoes up to 12" from the soil level when plants are larger. This prevents water splashing onto the plant, which can lead to blight. Check with our Plant Diagnostic Clinic in our office to identify which disease pest you are dealing with and which control method (chemical, mechanical or cultural) is best.

What to plant- What do you and your family like to eat? Make a list, limit it to items if you are new to gardening, and rank in order of preference. Choose time tested varieties, but experiment with small plantings of one or two new or unusual varieties each year.

Don't get over zealous. You must reap as you sow.

- Seeds or transplants? Some plants are better planted as transplants (tomatoes, peppers, cole crops, etc.) Other plants do well when planted from seed (peas, beans, corn, etc.).
- Choose varieties that have the fewest number of days to maturity. We have approximately 120 frost free days in Kootenai County (some areas fewer). We expect the last frost in mid to late May, and the first frost in mid-September. The number of days to maturity begins on the transplant date. Perennials, we are USDA zone 4 and 5 (plant for zone 4 or lower), Sunset Publications place us in zone 2a, plant for a zone colder.
- Choose disease resistant varieties. The capital letters after the variety name on the packet indicates what the plant is resistant to, usually VFN. V indicates verticillium wilt resistant, F indicates fusarium wilt resistant, and N indicates nematode resistant. Nematodes are usually not much of a problem in this area.
- **Tools:** short stakes, twine, measuring tape, hammer, hoe, trowel are helpful when planting. These tools help create even rows, if they are called for. Pound stakes in with side of hammer to avoid splitting the wood.
- Measure the distance between rows and plants, unless you plan to thin seedlings.

Hints- plant radish seeds with carrots and parsley. Both are slow to germinate, and the fast-growing radishes will mark the row for you.

Harvesting - First crops to be harvested are greens, early peas, onions.

Harvesting onions, different stages depending on use- Pick when ¼-1/2" in diameter for fresh table use; when 1"-1 1/2" for boiling and pickling. Wait until tops begin to yellow and fall over for storage (about 20%-50% of tops). Mature bulbs should not be readily dented by fingers, 2/3 of the bulb should be above soil line.

New potatoes and peas by the Fourth of July

Corn is a member of the grass family, ripens from bottom up. Check lower stalk first for ripening ears.

Pumpkin/squash- scrape shell with thumbnail. If thumbnail doesn't penetrate the skin, fruit is ready to harvest. Leave a short stem attached.

Refer to harvesting/storage handout.

Clean up - Good garden clean-up is essential to prevent insect and disease problems. Chop up vines, stalks, chunky stuff and till into the soil in the fall. (Can chop with lawn mower). Compost other organic material to incorporate into soil in the spring. Rule of thumb: chunky stuff in the fall, finer composted material in the spring. Do leave a few hollow flower stalks for our native bees to have nesting sites.

Cover crops - (per Dr. Barney, and Garden Way Publication A-5)

Purpose: To add minerals to the soil- turn under when crops are still young, green and succulent. Plant garden soon after turning under to prevent loss of nutrients.

To add organic matter to the soil-let the crops mature before turning under. The woody material will last longer in the soil, helps increase the humus in the soil. Wait 6-8 weeks to plant another crop.

Planting cycle: In the fall - Annual ryegrass (not the grain). Plant before mid-September, allowing time for crop to tiller out (crown out) before winter.

As early as possible in the spring, turn the annual ryegrass under by hand or tiller and plant garden peas. Peas tolerate cool soil temperatures.

Follow peas with a planting of buckwheat if soils have warmed to 55-60 degrees. Season permitting, you may be able to get in two plantings of buckwheat before late summer. Follow with annual ryegrass. You can start your planting schedule anywhere in cycle.