Crop Planning

By Katharine Rondthaler, Center for Sustainability
Santa Clara University

Why Crop Plan?

- Reduces nutrient deficiencies in the soil
- Reduces pest and disease between seasons
- Reduces waste and optimizes garden space

Growing Calendar: Proper timing is essential for plant success (See Master Gardener's Santa Clara County Planting Calendar)

Crop Rotation:

- Plant families are often susceptible to the same diseases and pests
- Nutrient needs vary between plants. Some plants, such as corn are 'heavy feeders,' needing lots of nitrogen and other nutrients. Most root crops are light feeders, while plants in the pea family fix nitrogen and help build soil fertility.
- Plant roots differ in depth and spread, and therefore differ in where they remove nutrients from the soil. Deep-rooted plants can open up channels in the sub-soil. This can help capture sub-soil minerals as well as improve drainage, aeration, and channels for soil organisms. Sod-forming shallow-rooted plants can crowd out weeds and help keep the surface soil crumbly and full of organic matter.

Follow a simple crop rotation by rotating heavy feeder plants, light feeder plants and soil building crops. Rotate plant families to assure no family is planted in the same space more than once in a three year period. Garden beds can be broken down into sections. The number of beds will depend on the length of the rotation plan you choose. For example, small gardens would have three sections and a three year rotation while large gardens may have eight sections and a eight year rotation.

Family Reunions: Plants listed by botanical family

Tomato family (Solanaceae): Tomatoes, peppers, eggplant, potatoes

Cabbage or mustard family (Brassicaceae): Broccoli, cabbage, cauliflower, kale, collards, radishes, Brussels sprouts, arugula, turnips, cress, mustards, many oriental greens, rutabaga, kohlrabi

Beet-spinach family (Chenopodiaceae): Beets, chard, spinach, quinoa

Pea family (Leguminosae, also known as Fabaceae): Beans, peas

Carrot family (Umbelliferae, also known as Apiaceae): Carrots, parsnips, celery, parsley, fennel, cilantro, dill

Squash family (Cucurbitaceae): Cucumbers, winter squash, summer squash, melons, pumpkins, zucchini

Sunflower family (Compositae also known as Asteraceae): Lettuces, endive, Jerusalem artichokes, sunflower, chicory, radicchio

Onion family (Alliumn or Liliaceae): onions, shallots, garlic, leeks, chives

Grass family (Gramineae): Corn, barley, rye, spelt, triticale, wheat

Buckwheat family (Polygonaceae): buckwheat, sorrel, rhubarb

Purslane family (Portulacaceae): purslane, miner's lettuce

Amaranth family (Amaranthaceae): amaranth

Mint family (Laminaceae): mints, lemon balm, anise hyssop, basil, marjoram, oregano, thyme, sage, winter savory

Nutrient Needs

Heavy feeders: Corn, tomatoes, beets, cabbage family crops (broccoli, Brussels sprout, cabbage, cauliflower, kale, kohlrabi, radish), celery, cucumber, endive, lettuce, parsley, pumpkin, cucumber, squashes, rhubarb, spinach, sunflower

Light feeders: Root crops (carrot, garlic, leeks, onion, parsnip, potato, rutabaga, shallot, turnip), bulbs, herbs, mustard, pepper, chard

Soil builders: alfalfa, beans, clover, peas

Root Depth

Shallow rooting (18-24 in.): Broccoli, Brussels sprouts, cabbage, cauliflower, celery, Chinese cabbage, corn, endive, garlic, leeks, lettuce, onions, parsley, potatoes, radishes, spinach

Moderate rooting (36-48 in.): Bush beans, pole beans, beets, carrots, chard, cucumbers, eggplant, muskmelons, mustard, peas, peppers, rutabagas, summer squash, turnips

Deep rooting (>48 in.): Artichokes, lima beans, parsnips, pumpkins, winter squash, sweet potatoes, tomatoes, watermelons, alfalfa, sunflower

Sample Crop Rotation

Bed	Season 1	Season 2	Season 3	Season 4
A	Tomatoes (heavy feeder)	Carrots (light feeder)	Peas (N-fixer)	Cucumbers (Heavy Feeder)
B	Beans (N-Fixer)	Broccoli (Heavy Feeder)	Carrots (Light Feeder)	Summer cover crop: buckwheat
C	Garlic (light Feeder)	Garlic Con't (light Feeder)	Peas (N-fixers)	Summer Squash (Heavy Feeder)
D	Melons (Heavy Feeder	Chard (Light Feeder)	Cover Crop: Favas, oat, vetch	Peppers (Heavy Feeder)

Companion Planting is used to:

- Work within ecological systems to support plant growth
- Reduce weeds
- Maximize space
- Reduce pest problems
- Increase pollinator populations and other beneficial insects

See Companion Planting Guide for suggested companion planting

Space Saving Techniques

Grow Vertically Trellises can save space by allowing plants to grow up rather than out.

- Plants to trellis: Cucumbers, winter squash, pumpkins, peas,

Potato towers maximize potato yield in a small space. Simply plant potatoes in chicken wire and fill with compost and soil as the plant grows. The plant tubers are produced at all points where the stem touches the soil.