

Herbs

Most herbs will grow well under the same sunlight, fertility, soil and growing conditions, and cultural techniques similar to many vegetable crops. Pay special attention to drainage and moisture requirements of certain herbs, since many are very sensitive to soil moisture conditions.

Sage, rosemary, and thyme require well-drained, slightly moist soil, while parsley, chervil, and mint grow best on soils that retain moisture. Using plastic mulches, trickle irrigation, and raised beds may provide the necessary moisture and drainage requirements for the herb crop.

Spacing

Raised beds are recommended for culinary herbs. These crops usually have common between-row spacing for convenience in cultivating. See individual herbs for details.

Lime and Fertilizer

Muck Soils: Maintain soil pH between 5.5-6.0. Consider liming on muck soils when the pH falls below 5.5. Apply all fertilizer in a broadcast application and disk in prior to planting.

Mineral Soils: Maintain a soil pH of 6.0-7.0. For average-fertility soils, apply 120 to 150 pounds of N per acre, 120 to 180 pounds of P_2O_5 per acre, and 120 to 180 pounds of K_2O per acre. Apply half before planting and the remainder as bands at planting, 2 inches to the side and 2 inches below the seed. Sidedress with 30 pounds of N per acre three to four weeks after thinning or transplanting.

Preplant: N: 60 pounds per acre. P_2O_5 : 0 to 150 pounds per acre. K_2O : 0 to 200 pounds per acre. Adjust according to soil type, previous management, and soil test results for your state.

Sidedress N: For soils with more than 3 percent organic matter and following soybeans, alfalfa, or a grass-legume hay crop, apply 30 pounds N per acre. For soils with less than 3 percent organic matter and the above rotation, apply 45 pounds N per acre. Following corn, rye, oats, wheat, or a vegetable crop, apply 60 pounds N per acre. Use a total of 90 to 120 pounds N per acre for culinary herbs. For herbs grown for seeds, such as coriander, fennel, and dill, use 60 to 90 pounds N acre.

Pest Control

Plastic or organic mulch is recommended for weed control. Most herbs are weak competitors to weeds, and while a few herbicides are registered on many herbs, they generally are for site preparation (glyphosate) or for preemergence control or postemergence control of emerged grasses. Weed control for the entire season requires integrating mulches, herbicides (if available), and cultivation. See the Leafy Vegetables chapter (page 154) for specific herbicides labeled for herbs.

Practicing good sanitation and paying attention to seed sources will help to lessen diseases. More information about pest control in herbs, see the Leafy Vegetables chapter (page 154).

Pesticide Use in Greenhouses

Before using any pesticide, always read the product label for mention of greenhouse restrictions. See Selected Information About Recommended Fungicides (page 79), Selected Information About Recommended Herbicides (page 69), and Selected Information About Recommended Insecticides (page 54).

Marketing

Fresh herbs certainly make excellent cash crops. However, growers should be very cautious before beginning herb production. Establish markets and buyers need before purchasing any seed. Some of the most popular culinary herbs include basil, chives, dill, French tarragon, mints, oregano, parsley, rosemary, and thyme. However, growers should do their own marketing study to determine which herbs are suited for their areas.

Possible outlets of culinary herbs include health food stores, grocery stores, upscale restaurants, farmers markets, and food manufacturing companies. Growers are also strongly encouraged to have greenhouses for year-round production.

Detailed descriptions of some popular herbs appear below.

Basil

Basil, French basil, or sweet basil (*Ocimum basilicum*) is a popular, tender, annual herb. It is native to India and Asia.

Basil is commercially grown for its green, aromatic leaves, which are used fresh or dried as a flavoring. Fresh basil leaves are used in tomato sauces and pesto sauces. Basil is also good with veal, lamb, fish, poultry, white beans, pasta, rice, tomatoes, cheese, and eggs. It is used in vinegar and tea.

Basil can be direct-seeded or transplanted to the field in late spring after all danger of frost is over. Basil seeds normally germinate in 8 to 14 days. Basil requires full sun and prefers moist, well-drained soil with a pH of 6.0. Typical spacing for basil is 12 inches between plants, 24 to 36 inches between rows. Suggested fertilizer should have an N-P-K ratio of 1-1-1 at a rate of 120-120-120 pounds per acre by a broadcast or plowdown. Sidedressing N at a rate of 15 to 30 pounds of actual N is recommended shortly after first harvest.

Trickle or overhead irrigation is necessary. Basil grown for dried leaves or essential oil is cut just prior to the appearance of flowers. The foliage should be cut at least four to six leaves above the ground to allow for regrowth and a subsequent crop. Information about insects and disease of basil is limited. Japanese beetle, powdery mildew, and downy mildew have been reported to attack basil. For weed control, a higher basil plant population coupled with mechanical cultivation is highly recommended. Refer to *Sweet Basil: A Production Guide*, Purdue Extension publication HO-189-W, available from the Education Store, www.edustore.purdue.edu.

Chives

Chives, *Allium schoenoprasum*, is a perennial that is native to Asia. It was first used by the Chinese and then the ancient Greeks. Fresh leaves are excellent for making herbal vinegars and butter. It is also used in salad, soup, and cheese. Chives are also used to add a mild onion flavor to fish, salads, steamed vegetables, soups, and omelettes.

Chive seeds require darkness, constant moisture, and a temperature of 60°F to 70°F for best results. Sow them ½ inch deep in pots or flats. Germination will occur in 2 to 3 weeks. Transplant seedlings to the field when they are 4 weeks old. Chives reach a height of 18 inches, a width of 1 to 2 inches the first year from seed, and 10 to 14 inches in subsequent years. Chives require full sun and well-drained soil with a pH of 6.0. No serious pests or diseases were reported although chives can get downy mildew and rust. To harvest chives, cut chive leaves 2 inches above the ground.

Cilantro

Cilantro, *Coriandrum sativum*, is an herb with a unique scent and flavor. Native to Egypt, cilantro is one of the most ancient herbs still cultivated. It is also known as Mexican parsley, Chinese parsley, or coriander. The dried seedpod is known as coriander and is usually used as a spice in baking and desserts. Cilantro leaves are a well-known salsa ingredient.

This annual plant does best in cool weather and should be planted in the early spring or in the fall. Optimum growing temperatures are between 50°F to 85°F. Plant seeds 1/2 inch deep and 2 to 3 inches apart. Germination may take 10-14 days. Cilantro grows 2 to 3 feet tall and thrives in moderately rich, light, well-drained soil in full to partial sun. Cilantro is highly salt sensitive and soil electrical conductivity values exceeding 1 dS/m could reduce yields. Plants have shallow root systems, so frequent irrigation is needed. Cabbage looper and green peach aphid sometimes cause economic damage by curling and twisting leaves, and stunting the plant. Bacterial leaf spot, which is seedborne, and Fusarium wilt are common diseases in cilantro production. Effective management strategies involve using clean seed material and avoiding fields that have a history of Fusarium. To harvest, cut cilantro either just below the soil or 1.5 to 2 inches above the crown, bunched, and tied together with a rubber band. Popular cultivars include Long Standing, Santos, and Calypso.

Dill

Dill, *Anthem graveolens*, is native to the Mediterranean area and southern Russia. It is a hardy annual, and sometimes is grown as a biennial. Dill is commonly used as a seasoning for soups, fish, and pickles. Its aromatic leaves, seeds, flowers, and stems can also be used to flavor cabbage, vinegar, butter, apple pie, cakes, and bread.

Direct-seed in spring about 10 inches apart. Since dill has long taproots, it should not be transplanted. Fresh leaves should be harvested before flowering begins. Harvest seeds as soon as seed heads are brown and dry. Dill does not have any serious pest or disease problems. However, phoma blight, rusty root, and stem rot have been reported.

Fennel

Fennel (*Foeniculum vulgare*) is a cool-season aromatic herb that originated in the Mediterranean region. It is a perennial but usually grown as an annual that grows to about 3 to 4 feet tall. Leaves are used as potherbs and for seasoning and garnishing purposes along with the bulb, which could be used as a fresh salad.

Planting can be done using seeds or transplants. Plant in full sun in rich and well-drained soil. Plant seeds at 1/4 to 1/2 inches deep in rows that are 2-3 feet apart. In-row spacing should be 10-12 inches. Transplant to the field early in the spring. Planting to harvesting for direct-seeded fennel could range from 90 to 150 days; and 110-125 days for transplanted fennel. Harvest by cutting just above the bulb near the leaf bases. Bulbs are further trimmed by cutting away most of the top growth. Leaf blight and stem rot are two major diseases affecting fennel.

French Tarragon

French tarragon, *Artemisia dracuncululus*, originates from southern Europe. Do not confuse it with Russian tarragon, *Artemisia dracunculoides*, which is much coarser, and has paler leaves, and a bitter taste. French tarragon is used to flavor vinegar, herbal butter, shellfish, pork, beef, poultry, many vegetables, and rice. Fresh leaves can also be used in salads, tartar sauce, and French dressing. French tarragon is a woody perennial that will grow 2 feet tall.

It produces few seeds, and must be propagated by stem cuttings or division. Plant in full sun in rich, well-drained soil with a pH of 6.9. Divide the plants every three to four years. Two harvests can generally be made each year, the first six to eight weeks after setting out. Harvest until leaves turn yellow in the fall. French tarragon is prone to root rot in heavy and wet soils.

Mints

Mints, *Mentha* spp., are a group of herbs that are mostly native to Europe and Asia. Some are indigenous to South America, America, and Australia. It is naturalized throughout North America from southern Canada and Mexico. With the possible exception of Corsian mint, mints are such rampant growers that they will quickly overwhelm other plants. Mints are commercially important as sources of flavor and menthol. Japanese mint (*M. Arvensis* var. *Piperescens*), peppermint (*M. Xpipita*), and spearmint (*M. Spicata*) are the mint species mostly cultivated.

Mints can be propagated by cuttings or seeds, except peppermint, since it is a sterile F1 hybrid of *M. Aquatica* and *M. Spicata*. Peppermint does not produce seeds and can only be propagated by cuttings. Mints can be planted in full sun or partial shade, and require rich, well-drained soil with a pH of 6.5. Mint can be harvested almost as soon as it comes up in the spring. Young, tender leaves and stems are the best. Mint is susceptible to verticillium wilt, mint rust, and mint anthracnose. The pests that

could bother mint include: spider mites, loopers, mint flea beetles, mint root borers, cutworms, root weevils, and aphids. For details, see Mint, page 180.

Oregano

Oregano, *Origanum vulgare* subsp. *Hirtum* also referred to as *O. Heracleoticum* and *O. Hirtum*, is native to the Mediterranean region. It is naturalized in the eastern United States. It is added to tomato sauce for a hot and peppery taste. It adds dimension to yeast breads, marinated vegetables, roasted meats, and fish.

Oregano is a perennial, and can be propagated by seeds. Direct-seed in the field and do not cover seeds since oregano seeds need sunlight to germinate. However, flavor can greatly vary among seed propagated plants. It is better to propagate by root divisions or cuttings from plants that are known to have strong flavor. Oregano reaches a height of 12 to 24 inches, and a width of 10 to 20 inches. It requires a site with full sun, and well-drained soil that has a pH of 6.8. Some of the pest and disease problems for oregano include aphids, leafminers, spider mites, and root rot. Oregano sprigs can be cut off when the plant is at least 6 inches high. In June, vigorously grown plants can be cut back to the lowest set of leaves. Plants will generally leaf out after two weeks and can be cut back again in August.

Parsley

Parsley is grown exclusively for its green leaves, or tops. The curled-leaf and Italian flat-leaf types are the most popular.

Field-seeding begins in early April and ends in May. Parsley is cut 1.5-2 inches from ground level to allow regrowth. About three or four cuttings are made, depending on the length of the growing season. Maintain soil pH at 5.5-6.0. Broadcast and disk in all fertilizer prior to planting. Apply 100 to 120 pounds of N per acre, 100 to 120 pounds of P₂O₅ per acre, and 100 to 120 pounds of K₂O per acre. After each cutting, broadcast 30 pounds of N per acre and cultivate. Row spacing should be 12 to 16 inches. Direct-seeding rate will depend on direct seeding equipment and could require 14 to 16 pounds per acre (70% germination). A 2-inch scattered shoe is used on most all planters. Row spacing depends on seeding equipment but is usually around 15 inches apart and in row plant spacing should be 4 to 8 inches. Seeding rate depends on seeding equipment and seed quality and could be up to 30 pounds per acre. Germination is enhanced by presoaking seeds in water for 24 hours, and then allowing them to partially dry.

Popular curled-leaf parsley cultivars include Moss Curled, Dark Moss Curled, Banquet, Decorator, Deep Green, Forest Green, Improved Market Gardener, Sherwood, and Perfection. Plain-leaf type cultivars include Plain and Plain Italian Dark Green. Hamburg type, which is grown for its enlarged edible root consists of the Hamburg cultivar.

Rosemary

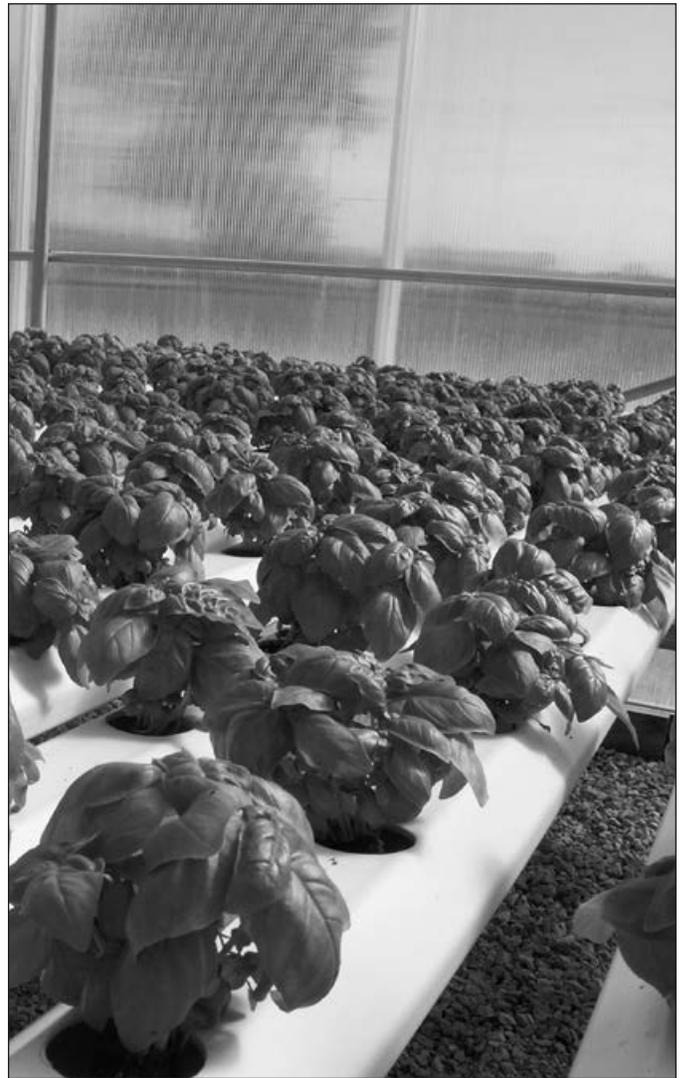
Rosemary, *Rosmarinus officinalis*, is a tender perennial hardy to zones 8 to 10. It is native to the Mediterranean, Portugal, and northeastern Spain. It is pungent, somewhat piny, mint-like yet sweeter, with a slight ginger finale. Its flavor harmonizes with poultry, fish, lamb, beef, veal, pork, and game. Rosemary also enhances vegetables, cheese, and eggs.

Rosemary can be started from seeds, but germination rates are very low. Use fresh seeds, preferably less than two weeks old. Packaged seeds are difficult to germinate. Start plants from cuttings or by layering from existing plants. Rosemary grows slowly from seed, and eventually reaches a height of 72 inches and a width of 36 to 72 inches. Plant rosemary in a sunny location with well-drained and slightly acidic soil. Pest and disease problems include aphids, spider mites, scale, mealybugs, root rot, and Botrytis gray mold. Harvesting can be done throughout the year. Cut about 4-inch pieces from the tips of the branches, being careful not to remove more than 20 percent of the growth at one time.

Thyme

Thyme, *Thymus vulgaris*, is native to the western Mediterranean region. It is a small, many-branched, and perennial shrub. Thyme tastes delicately green with a faint clover aftertaste. It ranks as one of the finest herbs of French cuisine. Thyme leaves and sprigs are used in clam chowder, meats, herbal butter, and vinegar. Use it with vegetables, cheese, eggs, and rice.

Start seeds indoors and transplant seedlings into the field once the danger of frost is over. Thyme reaches a height of 12 inches and a width of 10 to 12 inches. Thyme can be propagated from cuttings, by layering, and division. The pest and disease problems include spider mites and root rot. Harvest the entire plant by cutting them back to 2 inches above ground in midsummer. One more harvest can be expected before the season ends.



Basil is a potentially high-value crop that may be grown successfully in a hydroponic setting.