Virginia Cooperative Extension

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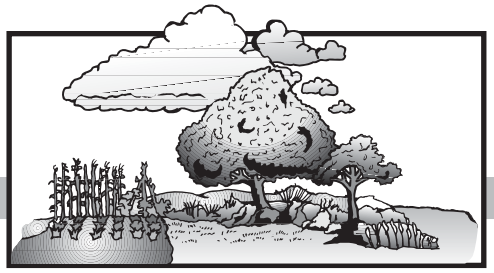

Environmental Horticulture

PUBLICATION 426-408

Leafy Green Vegetables

*Diane Relf and Alan McDaniel**

Lettuce

Environmental Preferences

LIGHT: Sunny, tolerates shade; prefers shade in summer

SOIL: Well-drained, loose loam

FERTILITY: Rich

pH: 6.0 to 7.0

TEMPERATURE: Cool (60° to 70°F)

MOISTURE: Moist, but not waterlogged; frequent, light waterings

Culture

PLANTING: Seed leaf or butterhead types as soon as soil can be worked in the spring, or in late summer. Crisphead and cos types may be transplanted in early spring or fall.

SPACING: Romaine, leaf, or butterhead: 4 to 10 inches x 12 to 24 inches; crisphead: 12 to 15 inches x 18 to 30 inches.

HARDINESS: Hardy annual.

FERTILIZER NEEDS: Medium-heavy feeder; use starter solution on transplants, sidedress if nutrient deficiencies are noted.

Cultural Practices

Lettuce, a cool-season vegetable crop, is one of the easiest to grow. Lettuce withstands light frost; however, sunlight and high summer temperatures usually cause seedstalk formation (bolting) and bitter flavor. Slow-bolting or heat-resistant varieties are available and are recommended for extending the lettuce-growing season.

There are several types of lettuce commonly grown in gardens.

Crisphead, also known as iceberg, is the lettuce most widely available as a fresh market type. It has a tightly compacted head with crisp, light green leaves. Many gardeners find this type difficult to grow because it requires a long season and some of the most advertised varieties are not heat-resistant and tend to go to seed as soon as temperatures go up. Select a slow-bolting variety and start seed indoors in late winter or late summer for best results. Transplant in early spring or fall to take advantage of cool weather and mulch well to keep soil temperatures from fluctuating and to hold in moisture. Organic mulch is more suitable than black plastic after soil warms up. Mulching also keeps soil off the leaves, reducing chances of disease from soil-borne organisms.

Butterhead, or **Bibb** lettuce, is a loose-heading type with dark green leaves that are somewhat thicker than those of iceberg lettuce. Butterheads develop a light yellow, buttery appearance and are very attractive in salads. There are miniature varieties of butterhead, which are very easy to grow, requiring a short growing time. One head of this lettuce is about right for one or two servings, so this is one lettuce to plant in succession, about two weeks apart. It may be started indoors for an even longer season. Bibb lettuce will develop bitterness readily if temperatures get too high.

Romaine, or **Cos**, is less commonly grown by gardeners, but is a very nutritious lettuce that deserves attention. It, too, is relatively easy to grow, forming upright heads with rather wavy, attractive leaves.

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Leaf type lettuce, either with green or reddish leaves, is the one most gardeners raise. This type is a fast growing, long-lasting lettuce used for salads, sandwiches, and in wilted lettuce salads. Leaf lettuce basically needs only to be planted, thinned, and harvested.

Cultivate carefully as lettuce is shallow-rooted. Use frequent, light waterings to encourage rapid growth, but do not overwater, as this may cause disease of roots or leaves. Overhead watering should always be done in the morning to give plants time to dry off. As mentioned above, mulches are helpful in maintaining soil moisture and keeping leaves off the ground.

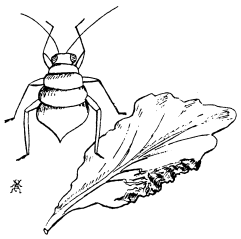
Lettuce planted in very early spring should be given full sun so that the soil will warm enough for rapid growth. For long-season lettuces, plant so that crops such as sweet corn, staked tomatoes, pole beans or deciduous trees will shade the lettuce during the hottest part of the day, when temperatures are over 70°F. Interplanting (i.e., planting between rows or within the row of later-maturing crops like tomatoes, broccoli, and Brussels sprouts) is a space-saving practice. Many lettuces are attractive in flower borders.

Lettuce is best planted in succession, or using different varieties that mature at different times. Thirty heads of iceberg lettuce harvested at once can present a major storage problem! Leaf and Bibb lettuces do well in hotbeds or greenhouses during the winter and in cold frames in spring and late fall.

Common Problems

DISEASES: Stem, leaf, and root rots.

INSECTS: Aphids, root aphids.



CULTURAL: Tip burn from irregular moisture or lack of calcium; bolting, bitterness due to high temperature or lack of moisture; leaf rots due to soil and/or water on leaves.

Harvesting and Storage

DAYS TO MATURITY: 40 to 80 days, depending on type

HARVEST: **Leaf** lettuce can be used as soon as plants are 5 to 6 inches tall. Use the older, outer leaves, which contain high levels of calcium, first. You may wish to harvest every other one of the largest plants to accomplish thinning.

Bibb lettuce is matured when the leaves begin to cup inward to form a loose head. The heads will never become compact. **Cos** or **Romaine** is ready to use when the leaves have elongated and overlapped to form a fairly tight head about 4 inches wide at the base and 6 to 8 inches tall. **Crisphead** is matured when leaves overlap to form a head similar to those available in groceries; heads will be compact and firm.

Crisphead lettuce will keep about two weeks in the refrigerator. Leaf, Bibb and Romaine will store as long as four weeks if the leaves are dry when bagged. If lettuce is to be stored, harvest when dry, remove outer leaves, but do not wash; place in a plastic bag, and store in the crisper drawer.

APPROXIMATE YIELDS: 5 to 10 pounds per 10-foot row.

AMOUNT TO RAISE: 5 to 10 pounds per person planted over cool season.

STORAGE: Cool (32°F), moist (95% relative humidity) conditions for two to three weeks.

PRESERVATION: Cool, moist refrigeration; canning and freezing not recommended.

Spinach

Environmental Preferences

LIGHT: tolerates partial shade

SOIL: well-drained loam, high organic matter

FERTILITY: medium

pH: 6.0 to 7.5

TEMPERATURE: cool (60° to 65° F)

MOISTURE: moist, but not waterlogged

Culture

PLANTING: Sow seeds 1/2 inch deep in early spring as soon as soil can be tilled and in late summer for fall and early winter harvest

SPACING: 2 to 4 inches x 12 to 18 inches

HARDINESS: hardy annual

FERTILIZER NEEDS: medium-heavy feeder; before seeding, broadcast 3 to 4 pounds 10-10-10 per 50-foot row, mix thoroughly with soil.

Cultural Practices

Spinach is a cool-season vegetable and should be grown in the spring or fall.

Long days and high temperatures cause the plants to bolt. There are spring and fall varieties of spinach. Spring varieties tend to be slower to bolt than fall varieties.

Conditions that stress the plant (excess cold, transplant shock, etc.) can cause it to stop growth and greatly reduce yield. Close crowding in the row also encourages early development of flower stalks.

In the mild parts of the state, spinach can be grown through the winter. Protection will be required in severe weather.

Because spinach is shallow-rooted, it does not compete well with weeds. Deep cultivation will destroy spinach roots and should not be used. An adequate supply of water is very important for good production, but waterlogged soil will also decrease production.

New Zealand spinach is an unrelated crop sometimes recommended as a summer substitute as it does well in hot weather. Yield is relatively low for the space required (1 foot x 3 to 4 feet). The 3 to 4 inches of branch tips are removed and cooked.

Common Problems

DISEASES: downy mildew, yellows, blight

INSECTS: aphid, leaf miner, cabbage worms

CULTURAL: early development of flower stalks (seeds were sown too late in the spring, hot weather induced bolting)

Harvesting and Storage

DAYS TO MATURITY: 40 to 70 days from seed

HARVEST: Spinach may be harvested from the time the plant has six to eight leaves until just before the seed stalk develops. The entire plant may be cut off just above the ground, or leaves can be harvested individually. The outer leaves should be pinched and not pulled off. Excellent raw for salads as well as cooked.

APPROXIMATE YIELDS: (per 10-foot row) 4 to 6 pounds

AMOUNT TO RAISE PER PERSON: 10 pounds

STORAGE: cold (32° F), moist (95% relative humidity) conditions 10 to 14 days

PRESERVATION: freeze, can

Cooking Greens

Environmental Preferences

LIGHT: sunny, tolerates partial shade

SOIL: well-drained

FERTILITY: rich

pH: 6.0 to 7.0

TEMPERATURES: cool (60° to 70° F)

MOISTURE: average

Culture

PLANTING: Seed from early spring to early summer or in late summer. Kale, collards, and Chinese cabbage can be grown as transplants.

SPACING: Collards: 18 to 24 inches x 24 to 36 inches; Kale: 10 to 18 inches x 18 to 36 inches; Mustard: 4 to 6 inches x 18 to 30 inches; Chinese Cabbage: 12 to 24 inches x 18 to 30 inches

HARDINESS: Kale and collards are hardy biennials; mustard is a hardy annual; Chinese cabbage is a half-hardy annual.

FERTILIZER NEEDS: medium feeder; sidedress when plants are 4 to 6 inches tall (1-1/2 ounces 33-0-0 per 10-foot row).

Cultural Practices

Most greens prefer the cool weather of spring and fall. Kale and collards are tolerant of hot summer weather. Mustard greens and some Chinese cabbage bolt quickly in summer and may be better as a fall crop. Rapid, succulent growth is desirable, so supply ample moisture and fertilization.

Many different types and varieties of greens are available. Kale can be tall or short; highly curled or plain-leafed; blue-green, yellow-green, or red. Chinese cabbage has heading or upright varieties.

Most greens are frost-tolerant and may taste better after cold weather sets in. In many areas of Virginia, kale and collards will grow all through the winter if slightly protected.

Common Problems

DISEASES: blackleg and black rot, clubroot, yellows

INSECTS: flea beetle, cutworm, cabbage root maggot and fly, imported cabbageworm, cabbage looper worm, aphid, harlequin bug

CULTURAL: bolting (too much heat, planting too early, growth stress due to drought)

Harvesting and Storage

DAYS TO MATURITY: 45 to 80

HARVEST: All green parts are edible, and may be harvested at any time. Seed can be sown somewhat thickly and the thinnings may be good in salads. Mustard, kale, and collards may have their larger leaves harvested. New leaves will provide a continuous harvest until leaves become tough or flavor strong. Chinese cabbage should be harvested as a mature plant 15 to 18 inches tall and makes an excellent salad crop as well as cooking green.

APPROXIMATE YIELDS: (per 10-foot row) Collards: 8 to 10 pounds; Kale: 3 to 6 pounds; Chinese Cabbage: 8 to 28 pounds; Mustard: 3 to 6 pounds

AMOUNT TO RAISE PER PERSON: all cooking greens - 5 to 20 pounds

STORAGE: cool (32° F), moist (95% relative humidity) conditions; 10 to 14 days

PRESERVATION: cool, moist storage best (may be canned)

Chard

Environmental Preferences

LIGHT: tolerates light shade

SOIL: well-drained loam

FERTILITY: medium

pH: 6.0 to 7.0

TEMPERATURE: cool (60° to 65° F)

MOISTURE: moist, but not waterlogged

Culture

PLANTING: Sow or transplant after danger of frost is past. For seed germination, soil temperature should be 40° F. Plant seeds 1/2 to 3/4 inch deep.

SPACING: 8 inches x 12 to 18 inches

HARDINESS: hardy biennial

FERTILIZER NEEDS: medium to light feeder; side-dress one month after planting and repeat applications every four to six weeks (16 ounces complete fertilizer per 50-foot row or 8 ounces sodium nitrate per 50-foot row)

Cultural Practices

Chard prefers cool temperatures, but is more tolerant of heat than spinach. Chard will produce greens steadily throughout the summer.

Because the chard "seed" is actually an aggregate of seeds, thinning is necessary. Thin to 4 to 6 inches apart when plants become 6 to 8 inches tall. When the plants get to be 8 to 10 inches tall, thin to 8 inches apart. Plants removed during thinning can be used in the kitchen.

Chard should be continuously harvested throughout the summer, as the removal of the outer leaves encourages the development of new leaves.

Chard does not compete well with weeds; therefore, shallow cultivation to control weeds is necessary.

Crop rotation is recommended to control leaf spot.

Common Problems

DISEASES: leaf spot

INSECTS: cabbage worms, aphid, beet leaf miner, flea beetle

Harvesting and Storage

DAYS TO MATURITY: 50 to 60 days from seed

HARVEST: Outer leaves are harvested when they are 8 to 10 inches tall and still tender and succulent. Leaves should be cut with a sharp knife, 1 inch above the ground. Continue to harvest in this way until fall. For the final harvest in the fall, the plants should be dug up before the first heavy freeze.

APPROXIMATE YIELDS: (per 10-foot row) 8 to 12 pounds

AMOUNT TO RAISE PER PERSON: 5 pounds

STORAGE: cold (32° F), moist (95% relative humidity) conditions; 10 to 14 days

PRESERVATION: freeze