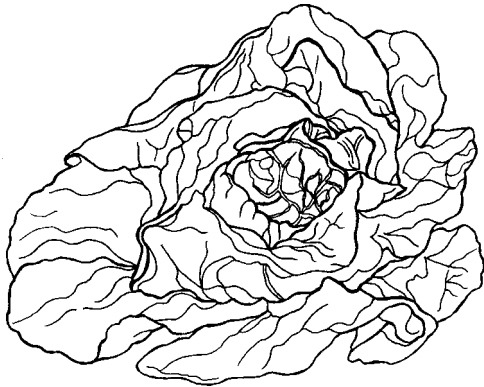


CULTURE AND VARIETIES FOR  
THE HOME GARDENER AND  
BEDDING PLANT GROWER



# Growing Leafy Vegetables

(Lettuce, Spinach, Turnip and Mustard Greens, Endive, Escarole, and Radicchio)

## SUGGESTED VARIETIES AND DESIRABLE CHARACTERISTICS

Variety	Days to maturity	Disease resistance	Suggested use	Comments
<b>Lettuce (crisphead or iceberg)</b>				
Cerise	61	—	G	Red heads, thick and crisp; loose leaf at 30 days
Crispino	64	—	G	White interior, juicy, mild
Ithaca	72	—	G	Resistance to tip burn and brown rib
Summertime	75	—	G	Slower to bolt than Ithaca
<b>Lettuce (Batavia)</b>				
Sierra	48	—	G	Red-tinged, resistant to tipburn, bottom rot, and bolting
Nevada	48	—	G	Green Sierra type, mild, resistant to tipburn and bolting
Anuenue	50	—	G	Green, crisp, nonbitter, heat resistant
Centennial	52	—	G	Greener and more flavorful than Iceberg
<b>Lettuce (romaine or cos)</b>				
Winter Density	64	—	G	Romaine with Buttercrunch interior, tolerant of frost; good for spring, summer, and fall
Rouge D'Hiver	68	—	G	The reddest cos; harvest small for mesclun salad mixes
Parris Island 318	71	—	G	Improved
Green Towers	72	—	G	Superior to Parris Island
<b>Lettuce (butterhead)</b>				
Waldemanns Drk Grn	48	—	G	Dark green; medium butterhead; resistant to tipburn
Pirate	49	—	G	Reddish tinge; heat-resistant, tender hearts
Sangria	51	—	G	Fancier red Pirate, tipburn resistant, less heat tolerant
Carmona	52	—	G	Larger, heavier, redder than Sangria, tolerant of bottom rot, tipburn, virus
Nancy	54	—	G	Large, green Boston with thick, crisp leaves
Buttercrunch	56	—	G	Slow bolting; excellent quality
Esmeralda	61	DMT	G	Very tipburn resistant
Summer Bibb	62	—	G	Popular, with excellent quality
<b>Lettuce (leaf)</b>				
Green Ice	45	—	G	Dark and crisp; fringed
Red Sails	45	—	G	Red with curled leaves, AAS winner
Salad Bowl	45	—	G	Heat resistant; ideal for home gardens
Concorde	47	—	G	Slow bolting, red-tinged, giant oak leaf
Red Fire	48	—	G	Red, wavy, frilled; slow bolting, heat tolerant
Slobolt	48	—	G	Heat resistant; thick leaf clusters
Red Salad Bowl	49	—	G	Red with finely cut leaves
Royal Oak Leaf	50	—	G	Favorite; slow bolting; green, giant leaves
Impulus	55	—	G	Heavily frilled, deep red, use for garnish and mixed salads; slow bolting

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SUGGESTED VARIETIES AND DESIRABLE CHARACTERISTICS, CONTINUED

Variety	Days to maturity	Disease resistance	Suggested use	Comments
<b>Spinach (spring)</b>				
Denali*	38	DMT	G	Smooth leaf, very early, white rust tolerant
Tyee*	42	DMT	C,F,G	Early; uniform; tender; bolt resistant; wrinkled
Olympia*	46	DMR	C,F,G	Smooth leaves, extremely slow to bolt; washes easily
<b>Spinach (summer)</b>				
Tyee*	42	DMT	C,F,G	The most bolt-resistant wrinkled type
Olympia*	46	DMR	C,F,G	Smooth leaf type is easy to wash; early summer harvest; slow to bolt
New Zealand (not a true spinach)	65	—	G	Heat tolerant; multiple harvest of branched tips
<b>Spinach (fall)</b>				
Indian Summer*	41	MR,DMT	C,F,G	Dark green; leaves moderately wrinkled; bolt tolerant
Skookum*	41	DMT	C,F,G	Dark green; leaves moderately wrinkled; bolt tolerant
Melody*	42	MR,DMR	C,F,G	AAS bronze 1977; medium-green leaves; slightly wrinkled; susceptible to leaf miner
Cold Resistant Savoy	43	MR	C,F,G	Overwinters; fine texture; deep green
<b>Spinach (overwintering)</b>				
Vienna*	40	DMR,MR	C,F,G	Leaves deeply wrinkled and erect; heavy yields; bolts easily in heat
Cold Resistant Savoy	43	MR	C,F,G	Fine texture with very wrinkled leaves; deep green; very slow bolting
Dk Green Bloomsdale	48	—	C,F,G	Large wrinkled dark green leaves; slow bolting
<b>Turnip greens</b>				
All Top Hybrid*	28	—	F,G	More tender; holds longer in hot weather
Just Right*	28	—	F,G	For fall harvest, glossy, tender leaves; snowy white, tender roots at 60 days; AAS winner
Shogoin	35	MR,DM	F,G	Aphid tolerant; leaves tall, strap shaped
White lady*	35	—	F,G	Long, bright green tops, sweet tender roots at 45 days
Seven-Top	45	—	F,G	Roots woody and inedible; tops very tender
Topper*	45	—	F,G	Less lobed leaves and higher yielding than Seven-Top
<b>Mustard greens</b>				
Savanna*	25	—	F,G	Very early, tender, productive; heat tolerant
Tendergreen	35	—	F,G	A mustard-spinach; resists heat and drought
Osaka Purple	40	—	F,G	Tender, green with purple-red veins
Vitamin Green	45	—	G	Flavorful but not mustardy; tolerant of cold and heat
Green Wave	50	—	F,G	Long standing; bright green
<b>Endive</b>				
Green Curled	90	—	G	Finely cut with curled leaves
Salad King	97	—	G	Tolerates hot and cold weather
<b>Escarole</b>				
Florida Deep Heart	85	—	G	Excellent type; extra deep hearts
Full Heart Batavian	90	—	G	Broad leaves; closely bunched

(table continued on next page)

SPECIAL PRECAUTIONS

Leafy vegetables are cool season crops of best quality when reaching usable size under moderately cool temperatures (45° to 65°F is ideal). Thus, in Pennsylvania, spring and fall plantings are recommended. Spinach, head lettuce, romaine, radicchio, and most leaf lettuce varieties may bolt or go to seed during the long, warm days of summer, so it is important to plant at the proper times. Loose, fertile, moist, sandy loam soils are best for growing leafy vegetables. Many of these crops have shallow root systems, so cultivate carefully.

CULTURAL PRACTICES

**Starting Seedlings**

To grow certain varieties of head lettuce, radicchio, and romaine or cos types in Pennsylvania, transplants rather than seeds should be used. Sew the seeds five to seven weeks before the desired field transplanting date. Certain varieties require light for germination. Once germinated, the seedlings should be transplanted into flats with 1 1/2 by 1 1/2 inches or 2 by 2 inches of space between plants. Harden and transplant lettuce and radicchio as soon as the danger of a hard freeze is over. Endive and escarole are often seeded in a small garden row for later transplanting. (Harden plants by reducing water and temperatures for about three days and placing them outdoors during the day for one week prior to transplanting in the garden. This helps plants adjust to outside conditions.)

**Soil pH and Fertility**

All leafy vegetables except lettuce grow best in soils with a pH of 6.0 to 6.8. Lettuce needs a pH of 6.5 to 7.0. Apply fertilizer and lime based on soil test results (kits can be purchased from county extension offices). In the absence of a soil test, apply 1 to 2 inches of compost and 3 lbs of 5-10-5 fertilizer per 100 sq ft for head lettuce, romaine, mustard greens, and radicchio; use 4 1/2 lb per 100 sq ft and mix into soil for spinach, leaf lettuce, endive, and escarole.

**Application and Sidedress**

Broadcast and work in the above amounts. Sidedress with small amounts of a high nitrogen fertilizer, or compost one or two times during the crop season.

**Seeding Dates Outdoors**

Leaf lettuce—April 1 to August 1  
Head lettuce, romaine, and radicchio—August 1

SUGGESTED VARIETIES AND DESIRABLE CHARACTERISTICS, CONTINUED

Variety	Days to maturity	Disease resistance	Suggested use	Comments
<b>Radicchio</b>				
Giulio	60	—	G	Best bright red heading chicory for spring production
Medusa*	65	—	G	Most uniform dark red heading chicory for spring and fall crops
Augusto	70	—	G	Most frost tolerant; burgundy red heading chicory for fall harvest only

**CODES**

Variety: \* = F1 Hybrid

Disease resistance: **DMR**= Downy mildew resistant **DMT**= Downey mildew tolerant **MR** = Mosaic blight resistant or tolerant

Suggested use: **C** = Canning; **F** = Freezing; **G** = Use fresh from the garden

*Spinach*—April and end of August  
*Turnip and mustard*—April 1 to August 1  
*Endive and escarole*—May to end of July.

**Transplanting Dates Outdoors**

*Head lettuce, romaine, and radicchio*—April 20 and August 15.

**Depth of Seeding**

Plant lettuce, turnip greens, and mustard greens 1/4 inch deep; plant escarole, endive, spinach, and radicchio 1/2 inch deep.

**Spacing Between Rows**

Leaf lettuce, spinach, mustard, and turnip greens should be spaced 1 1/2 feet apart; head lettuce, endive, and escarole 2 feet apart.

**Spacing Within Rows**

*Leaf lettuce*—6 inches  
*Head lettuce and radicchio*—12 inches  
*Spinach*—4 to 6 inches  
*Turnip and mustard greens*—8 inches  
*Endive and escarole*—15 inches

HARVEST SUGGESTIONS

*Lettuce*—Head lettuce, romaine or cos types, and radicchio are best harvested when the heads are firm but not so hard as to indicate overmaturity. Leaf lettuce may be harvested anytime after the outer leaves are 4 to 6 inches long. The leaves should be picked as needed.

*Spinach*—Spinach is harvested by cutting off the entire plant at the soil line. It may be harvested anytime after the plant has six to eight leaves. For mustard spinach (New Zealand), pick the tender new leaves at the tips of branches.

*Greens*—Mustard and turnip greens are harvested once the outer leaves are 6 to 8

inches long. New leaves throughout the season will provide uninterrupted harvest until warm weather causes strong flavor and tough leaves.

*Fall Salad*—Endive or escarole is fully developed when it is 10 to 12 inches in diameter. The center leaves should be blanched (by covering or tying loosely to exclude light) two to three weeks before harvest.

WEED CONTROL

Dense weeds within the garden not only rob crops of moisture, light, and plant food, but they also can harbor insects and create an ideal microclimate for the development of many diseases. Eliminate young weed seedlings with shallow hoeing or cultivation. Never allow weeds to become too big. Always pull or mow weeds around your garden area before they seed. Place mulch such as straw around plants and between rows to reduce weeds and conserve moisture. To help keep weeds and weed seeds out of the garden during fall and winter months, sow a thick cover crop in late summer or fall (use annual ryegrass or spring oats mixed with hairy vetch).

As a general rule, avoid using herbicides for weed control in the home garden. A few of the problems involved are:

1. There is no one herbicide available that can be used safely on all kinds of vegetables growing in the garden. Also, no one herbicide controls all weeds; each herbicide works on particular weeds.
2. Herbicides are difficult to apply at proper rates in small areas with hand sprayers. Usually, some areas generally receive too little herbicide for effective weed control while other areas receive

such heavy rates that the crop is damaged or killed.

DISEASE IDENTIFICATION AND CONTROL

Color photos of disease symptoms can be found in the publication *Identifying Diseases of Vegetables*, for sale from the College of Agricultural Sciences Mailroom or from your county extension office.

**Lettuce White Mold (Drop) and Gray Molds**

A wet rot appears at the base of the plant where outer leaves touch the soil. During wet weather, especially when plants are mature, rots progress into the head. Distinctive mold growth develops on the surface of affected tissue. Sclerotinia mold is white, and botrytis mold is gray and appears powdery. Soft rot bacteria can follow the molds and result in slimy rotted heads.

*Control:* Remove diseased plants (heads, dead leaves, and roots) as soon as symptoms appear. Do not plant lettuce in areas where similar disease has appeared in recent years on lettuce, cabbage, celery, tomatoes, or cucurbits. Plant in well-drained soil.

**Spinach Downy Mildew**

A yellow spotting first appears on the top surface of leaves. If downy mildew is the cause, following wet, cool weather, a violet to gray mold will appear on the underside of leaves, directly under the yellowish area observed on the top surface. Affected areas on leaves die.

*Control:* Where disease is a persistent problem, plant resistant varieties and rotate with other crops. Where necessary, check for garden sprays containing fixed copper.

**Spinach Mosaic (CMV)**

This can be a problem in fall crops. First, young leaves on isolated plants become mottled; later, older leaves on these plants can turn yellowish, plants are stunted and, in severe cases, plants may die. High temperatures promote rapid development of symptoms.

*Control:* Grow resistant varieties.

**Clubroot of Turnip and Mustard Greens**

The first sign that clubroot is present is a wilting of plants, especially where soil has been wettest. Pull a wilted plant to determine whether the wilting is caused by clubroot or insect grubs. Clubroot is characterized by distinct swellings on the tap and branch roots.

**Control:** Rotate all plants in the cabbage family (cabbage, cauliflower, broccoli, Brussels sprouts, radish, collards, kale, etc.) with unrelated plants. Where clubroot is present, following several years without related plants, clubroot may be minimized by applying hydrated lime to the soil before planting (3 to 4 lb/100 sq ft), mixing it thoroughly into the soil, and by providing good soil drainage.

**Control:** Eliminating weeds will aid in the control of leafminers. During most years sprays are needed to prevent injury. Spray with malathion or Pyrenone according to label directions.

**Aphids**

Aphids are small, soft-bodied insects, often called plant lice. They spread several virus diseases, reduce vigor and yield of plants, and contaminate leaves. Sometimes natural controls, such as beneficial parasites, hold down aphid population, especially if you have not recently used a broad-spectrum pesticide.

**Control:** Eliminating weeds will aid in the control of aphids. To control aphids use Diazinon (10 days to harvest) or dimethoate (14 days to harvest) or insecticidal soap. Follow directions on the labels according to plant type.

**Cabbage Worms**

Two worms attack leafy vegetables: the cabbage looper and the imported cabbage worm. The tiny, light green worms are called loopers because of their characteristic way of walking. The looping movement results from having only two pairs of legs toward the tail end of the body. Loopers do not overwinter in Pennsylvania, so problems vary from year to year. However,

it is during late August and September that the looper can cause considerable injury.

The imported cabbage worm is velvety green with numerous ridges across the body. The worms have four pairs of legs on the center of the body. The cabbage worm is a persistent problem, from early spring until frost. The adult insect is the common white butterfly often seen flying around cabbage plants.

**Control:** Avoid spraying directly over the tops of plants since most eggs and young loopers feed on the underside of leaves. To control cabbage worms use *Bacillus thuringiensis* (Bt) according to label directions. Bts are microbial insecticides and the only materials suggested for worm control. They must be used on a regular schedule, but Bts are most effective when the worms are very small.

Pest control programs for home garden vegetables use both cultural and chemical control measures. The success or failure of a fungicide or insecticide is related to correctly identifying the pest problem, the method of application, weather conditions, correct timing of sprays, and choosing the right pesticide.

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INSECT IDENTIFICATION AND CONTROL

**Leafminers**

Plants are often disfigured and damaged by several species of small flies that live as maggots between the upper and lower surfaces of the leaves. Their feeding causes large white blotches and winding trails through the interior of the leaf. Infected leaves are unattractive and unfit for human consumption.

The preferred hosts of the spinach leafminer are spinach, beet, and chard. The insect also attacks many species of weeds. Adult flies emerge in April and deposit eggs on the underside of the host plant's leaves. The eggs hatch in four to six days, and the young maggots bore directly into the leaves where they feed for 10 to 14 days. There are three generations each year.

MINIMUM NUMBER OF DAYS BETWEEN LAST APPLICATION AND HARVEST

Pesticide	Swiss chard			Turnip greens			Lettuce
	Collards	Kale	Spinach	Endive			
Diazinon	12	10	10	10	10	10	10
Methoxychlor	NL*	14	14	14	NL*	NL*	14
Dimethoate	14	14	14	14	14	14	14
Malathion	7	7	7	7	7	7	7-14
Bt	NL*	0	0	0	NL*	0	0

\*NL = not labeled

MATERIALS LABELED FOR CERTAIN PESTS

Diazinon – Aphids, imported cabbage worms, harlequin bugs, flea beetles, leafhoppers, dipterous leafminers

Methoxychlor – Flea beetles, leafhoppers, imported cabbage worms

Dimethoate – Aphids, leafhoppers, leafminers

Malathion – Aphids, leafhoppers, leafminers

Carbaryl – Flea beetles, leafhoppers, imported cabbage worms, armyworms, corn earworms, stink bugs, tarnished plant bugs

Bt – Cabbage loopers, imported cabbage worms

Safer soap – Aphids, white flies