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## G92-1123 Spinach and Swiss Chard

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# Spinach and Swiss Chard

This is a guide to the growing, harvesting and use of spinach and swiss chard.

*Laurie Hodges, Extension Vegetable Specialist*

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## Spinach

Spinach is a cool season crop and belongs to the goosefoot family (Chenopodiaceae), along with Swiss chard and beets. Spinach is low in calories. It is a good source of vitamin C, vitamin A, and minerals, especially iron. After washing the leaves, cook them in a covered pan using only the water clinging to the leaves. After cooking, add salt and butter, vinegar, or mustard for added flavor. Spinach may be prepared in a souffle, creamed soup, or used raw in salads.

### Cultural Requirements

Spinach is very hardy and can withstand temperatures as low as 20 F. It can be the first garden vegetable planted in the spring since the seed germinates at low temperatures. Spinach thrives in cool, moist conditions. It does not tolerate hot weather and begins to bolt or go to seed as daylight lengthens and temperature increases in June. Two spinach crops are possible in Nebraska; the second can be planted in late summer for harvest in the fall.

Suggested earliest and latest spring and fall planting dates for different regions in Nebraska are:

Spring Planting		Fall Planting	
Earliest	Latest	Earliest	Latest
East	3/15	5/10	8/20
Central	3/20	5/15	8/15

West	3/25	6/10	7/30	8/20
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Fresh spinach seed germinates readily at 38-40F and may be planted with good results when soil temperatures are 50 to 60 F. Higher temperatures reduce seed germination. Soil temperatures above 85 F will inhibit seed germination. Spinach seed rapidly loses viability. Fresh seed should be purchased each year. Spinach should be planted in rows 1 to 2 feet apart. The seed should be placed 1/2 inch deep and planted to have one plant every 3 to 4 inches after thinning. One packet of seed will plant 25 feet of row. One ounce of seed will plant 100 feet of row. Commercial seeding rates are 12-15 pounds per acre.

Spinach requires a soil pH of 6.0 - 6.5 and will not grow well if pH is below 6.0. Indications of possible soil pH problems include poor seed germination, yellowing and browning of the margins and tips of seedling leaves, browning of roots, and generally slow growth or death of the plants. If soil pH is too high, leaves may show a generalized yellowing or chlorosis.

Spinach is adapted to a range of soil types, from light and sandy to silty clay loams. In heavier soils, spinach should be grown on raised beds to improve drainage for the shallow-rooted plants. Seedling damping off can be reduced by use of raised beds. After seeding, the soil should be kept uniformly moist. When irrigating the garden, apply water in the morning so that the foliage is dry before dark. Apply sufficient water to moisten the soil to a depth of six inches. A uniform supply of soil moisture is required to produce high quality, tender spinach.

Spinach growth starts slowly and then accelerates during the final 21 days before harvest. If a soil test has not been taken, broadcast 5-10-10 fertilizer at 30 pounds per 1,000 square feet before planting. Spinach should be side-dressed once during the growing season with ammonium nitrate at 1 pound per 100 feet of row or calcium nitrate at 2 pounds per 100 feet of row. A total of approximately 150 lb/A of actual N is recommended, usually applied 1/2 preplant and 1/2 as a broadcast application 3-4 weeks after seeding. Spinach requires fairly high boron (B). Most soils in Nebraska supply adequate boron for spinach. Spinach plants can become stunted with dark roots and small, flattened, yellow leaves when boron is deficient. An application of 1 pound of boron (10 lb/A of borax) broadcast before seeding should eliminate the problem in subsequent years. NEVER use boron unless needed and then only in the recommended amounts. Boron is highly toxic to many other garden plants including snap beans, cucumbers, peas and strawberries.

Emergence rate varies depending upon soil temperature; time from planting to harvest also is highly temperature dependent. Generally, most varieties can be harvested 45 to 50 days after planting. Spinach can be harvested from the time the plants have five to six leaves until just before seedstalk formation.

## Varieties

Spinach varieties are separated into types with flat leaves, leaves that are semi-savoyed (crinkled), or those that are heavily savoyed. The flat-leaved types are used primarily by the processing industry since soil particles are easier to wash off. The thick leaves and ease of washing also make this type attractive to certain fresh market consumers. Whatever type, fresh spinach should be crisp, succulent and dark green, with a minimum of stems.

During the past ten years, a major change has occurred in the type of spinach grown, primarily due to advances in breeding mildew resistance into types adapted to North America. The hybrid varieties show superior vigor, uniformity, bolting resistance and disease resistance compared to the older varieties. The more upright growth habit makes harvesting easier and keeps the leaves cleaner.

- *Seven R* is a standard, semi-savoyed cultivar that is best for early spring and fall plantings. Plants are

large and quick-growing. The erect leaves are good for mechanical harvesting. It is resistant to both race 1 and race 2 of downy mildew.

- *Marathon* has a savoy leaf. It is better than Seven R for spring plantings since it is slower to bolt (form flower stalks) in warm weather. The leaves are large, dark green, semi-erect and long standing. It is used for both fresh market and processing from late winter and spring plantings.
- *Melody F<sub>1</sub>* is a semi-savoyed type. Plants are large and quick growing with very deep color. Leaves are thick and rounded. It is resistant to downy mildew and cucumber mosaic virus.
- *Vienna F<sub>1</sub>* has large, savoyed leaves forming an erect plant type. It is best planted in the fall as it tends to bolt in spring plantings.
- *Grandstand* has semi-savoy leaves, is long-standing and semi-erect. The leaves are medium large and medium green. It is resistant to downy mildew and mosaic and is used in the spring, primarily for processing.
- *Tyee F<sub>1</sub>* is becoming a new standard for savoyed spinach. The leaves are dark green with an upright growth habit that produces cleaner leaves. It is a bit slower growing than some other savoy types but stands well in hot weather because it is slow to bolt. It is good for a spring crop. It also is tolerant to downy mildew races 1 and 3.
- *Long Standing Bloomsdale* is a heavy-savoy type, adapted for late spring and early summer harvest. Leaves are dark green and medium large. Plants are medium large and erect. It is an older variety. Other Bloomsdale types, such as Long Standing Savoy #653, have been selected for earlier maturity and slow bolting.

If growing spinach for shipping, the savoy varieties are best because they pack less closely than the smoother types and retain market quality better. They are slower to wilt or turn yellow after harvest. Smooth-leafed varieties are easier to clean and prepare for canning or freezing. Contact the local Cooperative Extension office for additional information if you are considering growing spinach for wholesale shipping.

## **Pests**

Diseases on spinach tend to be those that develop under cool, moist conditions. One symptom characteristic of downy mildew is light-yellow areas on the leaves. Infected young plants may be pale green, stunted, with leaves heavily savoyed. During periods of high relative humidity or rainfall, sporulation will occur, appearing as a white mass, eventually turning purple. Most modern varieties are resistant to downy mildew. White rust is a serious problem in spinach production in the southern Great Plains and Texas. White, blister-like pustules appear, usually only on the lower side of the leaf. Surrounding tissue browns and dies. A few fungicides are available for use in spinach produced on a commercial scale. There are no fungicides registered for use by home gardeners on spinach.

Insect pests include the green peach aphid, seed corn maggot, cabbage looper, cucumber beetles and the spinach leaf miner. Aphids can be a major problem because they transmit virus to the spinach and are difficult to control, especially in the savoyed leaves.

Spinach is shallow rooted. Cultivation to remove weeds must be shallow to minimize damage to the roots. A few herbicides are available for commercial production. For smaller plantings, hand weeding is recommended.

Contact your county Cooperative Extension office for methods to control insects, weeds and diseases in larger plantings.

## **Harvesting and Storage**

Spinach can be harvested until seedstalk formation. Spinach planted for early harvest is subject to bolting as daylight lengthens in late spring and early summer.

Spinach is harvested by cutting the stem below the head or rosette of leaves. The crinkled leaves should be rinsed thoroughly in cold water to remove any grit soil particles. The leaves are then bunched. Remember that fall spinach is very hardy and not easily damaged by frosts. Harvest dark green, tender leaves that are 3 to 6 inches long. In the home garden, start by picking the outer leaves and then harvest the newer leaves as they reach the desired size. Spinach not needed immediately for eating is best left in the field until severe freezing is forecast. Harvested spinach can be kept in a moisture-retentive container in the refrigerator for as long as 40 to 50 days.

## Swiss Chard

Swiss chard is a type of beet that is grown for its large leaf stalks and leaves. It produces no enlarged fleshy roots. It is low in calories and minerals and a good source of vitamins A and C. Chard leaves are best prepared like spinach or beet greens - cooking with only the water that clings to them following washing. A bit of garlic or nutmeg and butter enhances the flavor of chard leaves. Chard stems have a delicate flavor much like asparagus and are prepared in a similar way. Stems should be stripped of leaves, cut into conveniently sized pieces, and gently steamed in salted water until tender. Cooked and chilled stems are very good with salad dressing or mayonnaise. Leaves and stems may also be cooked together.

The garden fresh quality of Swiss chard is well preserved when frozen. Chard withstands hot weather and provides greens and stems when spring spinach and asparagus are no longer available. With proper care, it will continue to produce through much of the fall. It is not uncommon for Swiss chard to remain fresh in the garden through the first snowfall or until temperatures fall into the teens Fahrenheit.

### Cultural Requirements

Chard, like the larger rooted table beet, is a hardy vegetable. It grows successfully regardless of soil type, length of day or temperature. Suggested planting period for different regions in Nebraska are:

	<b>Earliest</b>	<b>Latest</b>
<b>East</b>	4/10	8/10
<b>Central</b>	4/15	8/15
<b>West</b>	4/30	7/25

Seeds are scattered in the row 1/2 to 1 inch deep. In home gardens or market gardens, chard seedlings should be thinned to a 3-inch spacing between plants. Thinnings can be eaten cooked, or raw in salads. Rows should be spaced 2 to 3 feet apart. One standard packet of seed will plant 25 feet of row; one ounce will plant 100 feet. The closer spacing allows the foliage to shade the soil better and helps prevent germination of warm season grassy weeds.

### Varieties

Chard varieties are ready for harvest about 55 days from planting. There are not many different varieties of Swiss chard. Lucullus is an older variety. It produces large, crumpled, dark-green leaves with thick, succulent pale green stems. Fordhook Giant produces leaves that are heavily crinkled and dark green, 24-28 inches tall. The midrib is broad, thick and white. Rhubarb, a strikingly different variety, has use as an ornamental as well as for eating. Rhubarb has dark green crumpled leaves with wine red veins borne on bright crimson leafstalks, 20-24 inches tall.

## **Pest Control**

Pests affecting Swiss chard are similar to those in spinach. Control measures for home gardeners and commercial plantings are limited.

## **Harvesting**

Harvesting is done by removing the outer leaves, allowing the center leaves to grow. Stems of these outer leaves should be cut, while still tender, 1-2 inches above the soil surface. Leaves are of best quality just when fully expanded or slightly smaller. Take care to avoid damage to the growing bud in the center of the growing leaves. When harvested carefully, chard will continue to produce leaves through the summer into late fall. Swiss chard is prepared for market by washing thoroughly, discarding any yellowed or damaged leaves, and bunching the leaves. Storage is not recommended, although quality can be maintained for a shorticulture time by icing and refrigeration.

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