NC STATE UNIVERSITY

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HOME GARDEN SPINACH

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Spinach is a cool season crop and belongs to the goosefoot family (*Chenopodiaceae*) as do beets and Swiss chard. This crop is becoming more popular as evidenced by increases in consumption of both fresh (salads) and processed spinach. It is high in vitamins and minerals. Spinach reaches edible maturity quickly (37 to 45 days) and thrives best during the cool, moist seasons of the year. During periods of warm weather and long days, spinach will produce seed. This cold-hardy crop can withstand hard frosts with accompanying temperatures as low as 20 °F. Spinach can be overwintered for early spring production in many areas of the state.

Varieties

Melody F_1 - Semi-savoyed type. Plants are large and quick growing with very deep color. This variety is for both spring and fall crops. It is resistant to downy mildew and cucumber mosaic virus.

Vienna F_1 - Large savoyed dark green leaves are produced on upright plants. Restrict the variety to fall crops. It has some resistance to downy mildew (race 1, 2, 3).

Skookum F_1 - Round semi-savoyed dark green leaves borne on upright plants. Good for spring and fall plantings. Resistant to downy mildew (race 1, 2, 3).

Savoy Hybrid 612F - Deeply savoyed large dark green leaves on an upright plant type. It is good for a fall crop and for freezing. It is resistant to downy mildew and cucumber mosaic virus.

Seven R - Semi-savoyed type. Plants are large and quick growing. It has resistance to both race 1 and 2 of downy mildew.

Tyee - Plants are semi-savoy, large, fast growing, very slow bolting, heat and cold tolerant variety.

Savoy varieties are less inclined to wilt or turn yellow. Smooth leaf varieties are easier to clean and prepare for canning and freezing.

Soils - Spinach can be grown successfully on a variety of soils, but a fertile sandy loam high in organic matter is preferred. The soil pH should range between 6.4 to 6.8. **Note:** Spinach is very sensitive to acid soils, thus a soil test prior to planting this crop should be made and, if recommended, the necessary lime applied. Use dolomitic lime if magnesium is required. Low germination, yellowing and browning of the margins and tips of seedling leaves, browning of roots, general slow growth and even death of plants, may indicate that the soil is too acid. If the pH is too high, leaves may have a yellow color referred to as chlorosis.

Fertilizers - Spinach requires a high level of fertility, especially nitrogen. Early spring spinach may require larger quantities of fertilizer than fall crops. Apply 3 lb of

10-10-10 per 100 ft^2. Fertilizer is often broadcast and worked into the soil prior to seeding. If the fertilizer is banded at seeding it should be placed along each side of the rows 2 to 3 inches below the level of the seed and 6 inches to the side of the row; fertilizer should never come in contact with the seed. Sidedress with two or more applications of 0.3 oz of 10-10-10 per 10 ft of row. Spinach, like beets and a few other crops, requires fairly high boron (B). Boron deficient spinach has dark roots and numerous small, flattened, yellow leaves and is generally stunted. An application of 1 oz Borax per 100 ft^2 of row, broadcast prior to seeding, should prevent that problem. **Note:** Use boron only if needed and only in the amounts mentioned above.

Region	Seeding Time
Coastal Plain	February to March Mid-August to late October
Piedmont	Late February to early April August to mid-October
Mountains	March to April Mid-July to mid-September

Spinach seed that is more than a year old, rarely germinates over 80%. Older seed is even less viable and germinates more slowly and irregularly. It is important to use new, fresh seed each year.

Fresh seed germinates readily at 38 to 40 °F with good results at 50 to 60 °F. Higher soil temperatures result in reduced germination. Multiple rows on a bed will increase production efficiency per unit of land. Beds can range from 3 to 5 ft wide depending on planting and cultivating equipment. Raised beds offer many advantages for spinach production. The spinach may be sown 4 to 6 inches in-row and in rows as close as 10 to 12 inches at a depth of $^1/_2$ to $^3/_4$ inch. The soil should be firmed over the seed to help insure rapid and uniform germination.

Thinning - Precisely seeded spinach is not usually thinned because large individual plants are not needed for a usable product. The in-row spacing can be regulated by adjusting the rate of seeding. In rare cases when thinning is required, it should be to 2 to 4 inches when the plants have two well-formed true leaves.

Pest Management

Weeds* - Any cultivation used to control weeds on the beds between the rows should be shallow.

Insects* - Spinach aphid and leafminer are the two predominant insect pests of spinach.

Diseases* - downy mildew (bluemold), bacterial soft rot, fusarium wilt, cucumber mosaic virus, Cercospora spot, white rust and Heterosporium spot can all be problems in spinach production.

* For pest control consult the current the NCCVR (*North Carolina Commercial Vegetable Recommendations*, AG-586) or county Extension center for specific recommendations.

Irrigation - Spinach requires abundant moisture to insure a high quality product. An application of one inch of water every 7 to 10 days when rainfall is inadequate is recommended. Keep soil moist until seedlings have emerged.

Harvesting - Spinach is ready for use as soon as it is edible size and it must be harvested before there is extensive yellowing, breakage and other leaf deterioration or the development of seedstalks. Spinach is usually cut below the crown with a knife, taking care to keep the plants clean and to prevent undue breakage or bruising of the leaves. Spinach should be sorted to remove all yellow or damaged leaves. If spinach is slightly wilted when preparing, it will be less subject to breakage.

Some Conditions That Influence Growth - Spinach quickly bolts (produces a flowerstalk) and produces seed under long day (short night) and warm weather conditions. The terms "long standing" and "slow to bolt" in the seed catalogs are associated with varieties that have shown a slowness in bolting to seed. Best yields are obtained when the days are short and the temperature is moderately cool because the plant will continue to grow without starting to develop a seedstalk. High temperatures are likely to result in leaf yellowing. Soil moisture shortage intensifies the effect of heat.