EC00-1207 Growing Onions, Shallots, and Chives

Susan Schoneweis
*University of Nebraska-Lincoln*

Laurie Hodges
*University of Nebraska at Lincoln, lhodges1@unl.edu*

Loren J. Giesler
*University of Nebraska-Lincoln, lgiesler1@unl.edu*

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The common onion (Allium cepa) is the most popular and widely grown Allium in Nebraska home gardens. Many members of the onion family (Alliaceae) are used in flower gardens because of their interesting flowers and foliage, but here we’re going to focus on the onion as a vegetable crop.

Onions are thought to have first been domesticated in the mountainous regions of Turkmenia, Uzbekistan, Tajikistan and northern Iran, and have been cultivated for more than 5,000 years. As people moved all over the world, the onion and its relatives in the Allium genus or Alliaceae families moved and adapted to their new homes. Onions, garlic and other alliums have been used throughout history for both culinary and medicinal purposes. Scientists found that the various sulfur compounds contained in onions and garlics that give them their distinctive flavors also have anti-microbial and anti-fungal properties, giving validity to their historic medicinal value.

When fresh onion tissue is damaged, flavor precursors react with the enzyme alliinase and the flavors and aromas develop. This is why whole onions do not have an odor until they are damaged. The presence of an odor from intact alliums often indicates that mechanical damage or decay has occurred. Heat destroys alliinase, so whole boiled onions tend to have little flavor because the flavor precursors have little chance to react with the enzyme.

Types of Onions

Onions are often grouped according to taste. The two main groups are the strong-flavored types (American) and the mild types (European or Bermuda). Generally, the more pungent onions produce bulbs that are smaller and have a firm or dense texture and a better keeping quality than the milder, sweeter onions. Each type has three distinct colors — yellow, white, and red. Red onions have a deep red to purplish-red skin which makes them attractive in salads or wherever raw onion rings are used. Sweet onions, such as the Vidalia and Walla Sweets, are low in sulfur compounds, but their flavor may be altered by the soil sulfur level.

Onions also may be grouped according to the duration of light required to trigger bulb formation — short, intermediate, or long-day onions. Generally, a short-day onion will form bulbs when the day length is between 10 and 11 hours long, conditions occurring...
in Nebraska in early February. Long-day onions require a minimum of 14 hours of daylight before bulbs form. In Nebraska, daylight hours exceed the long-day minimum by early May. Since the size of the bulb is directly related to the number of leaves formed prior to bulb initiation, long-day or intermediate-day onion cultivars are best for Nebraska.

Each onion cultivar within a photoperiod group (long-, short-, or intermediate-day) needs a specific number of hours of daylight to induce bulbing. Once the daylength (photoperiod) requirement is met, other factors can reduce leaf size and result in premature bulb formation or small bulbs. These factors include drought stress, hail damage, insect damage, close spacing, and weed competition, among others. Although short-day onions, such as the onion cultivar “Granex 33” grown in Vidalia, Georgia or the Texas 101S Y can be grown in Nebraska, it is necessary to plant sets in very early February and grow them rapidly to obtain large onions. Some Nebraska gardeners have grown these successfully by using black plastic mulch or occasionally without mulch, but it can be a challenge in our climate.

Most cultivars adapted to Nebraska conditions are fairly pungent and generally keep better than the mild, sweet onions produced in the spring. The cultivars used as storage onions are yellow and fairly pungent. The European or Bermuda onion cultivars are mild and several long- and intermediate-day cultivars are available, such as Sweet Spanish, Sweet Sandwich, Ringmaster, and the Walla Walla Sweet. These do not store well but are fine for use within a month or so of harvest.

**Growing Onions**

Onions may be grown from seed, sets or transplants for use both as green onions and dry bulbs for storage. Using onion sets is the easiest way to grow a crop, followed by transplanting and direct seeding. Onions are adapted to a wide range of temperatures and are frost-tolerant. Early spring planting is essential because best growth occurs when cool temperatures (55°F to 75°F) prevail and several leaves can develop before bulbing begins. Nebraska gardeners should note the size, shape and use as described in seed catalogs and select intermediate- or long-day cultivars when growing from seed or transplants. Short-day onions, which often are available as transplants in garden stores, must be planted very early in order to produce well.

**Sets**

Onion sets are small onions grown from seed with the growth arrested so that it can resume at a later time. Sets often are produced by planting a short-day onion cultivar under long-day conditions to induce early bulbing. They are planted very thickly to limit bulb size. They are then harvested in the summer and stored for replanting the following spring. The main reason to use sets is for earliness or to allow mature bulb development in areas with short growing seasons. Usually onion sets are labeled by color, not specific cultivars. Sets can be used for green onions (also called scallions) or can be left to grow for mature storage bulbs. Green onions can be pulled when plants are 6 inches or taller. There are also cultivars to grow from seed that will produce a true bunching onion or scallion that does not form a bulb.

One disadvantage of planting onions from sets is their tendency to bolt (form seed stalks) and bloom. To reduce bolting, sort and select small onion sets, 1/2 to 1/3 inch in diameter from the larger sets. Plant the larger sets (over 3/4 inch diameter) for early harvests of green onions as they are more likely to bolt if the young shoots are exposed to prolonged temperatures below 45°F.

Plant onion sets one to two inches deep, close together and thin to 3- to 4-inches apart as you harvest green onions. If you don’t plan to harvest green onions, the initial spacing should be 3 to 4 inches between sets. Rows should be 16 to 24 inches or more apart depending on the method of cultivation. For wide row planting, plants or sets are placed on 3- to 4-inch centers. Onions are ideal for wide row planting, but keep in mind that weeding then must be done by hand.

**Plants**

Onion plants often are produced in the south from seed planted in the fall and are usually bundled in the field in groups of 50 to 100 plants. Onions from transplants and seed usually do not form flower stalks the first year. Garden stores may sell packs of locally grown transplants or you can grow them under plant lights by starting seed in early February. Unlike sets, bundles of onion plants are identified by cultivar so you can choose the type you want. Garden centers often sell short-day sweet onion cultivars as well as long-day sweet and storage onions. For best yields of short-day cultivars, transplant them as early as the soil can be worked, late February or early March. If transplant roots seem dry, trim them slightly and soak in tepid water for a few hours to re-hydrate them before planting. Set the base of the plants 1 to 2 inches deep and 3 to 4 inches apart, lightly firm the soil, and irrigate. Onions grow well when grown on raised beds mulched with black plastic and using drip irrigation. The plastic mulch not only controls weeds but also raises the soil temperature for more rapid growth and development. Cut holes in the plastic, spacing the holes about 3 inches apart. The set or transplant is then planted in the hole.
Transplants

Onion transplants can be easily grown indoors. Use a pasteurized planting mix of equal parts by volume of vermiculite, sphagnum peat, loam garden soil and perlite. Seed of short-day cultivars started indoors in January and transplanted to the garden in mid-March should produce a harvest in June. Long-day cultivars can be started in mid-February and set out in late March to mid-April. They will be ready to harvest in August to September. Sow the seeds thickly and keep at 70°F to 72°F. As soon as seedlings emerge, place in a sunny window or under a fluorescent light for 10 hours per day. Harden seedlings for about two weeks by gradually exposing them to cooler temperatures and direct sunlight. Transplant them with 3- to 4-inch spacing in all directions between plants.

Seed

Direct seeding of long-day cultivars may be done in early spring. Since onion seeds will germinate in soils 40°F or higher and the best seedling growth temperature range is from 68°F to 77°F, seeds planted in March and April in Nebraska can yield well.

Seeds should be sown 1/4 inch to 3/4 inch deep and 2 to 3 inches apart in clay and clay-loam soils and slightly deeper in loam to sandy soils. Seed can be planted singly in rows or broadcast over rows or beds 12 to 24 inches wide. Onions can be slow to emerge, so sprinkle a few radish seeds in the row to mark the location and help break any soil crust. Harvest the radishes and thin the onions at the same time, leaving 3 to 4 inches between onion plants. If left crowded, you can produce small bulbs for boiling, pickling or pearl onions. The main disadvantage with wide rows is that weeding between plants must be done by hand rather than with a hoe and if the onions are left too crowded they will not form large bulbs.

Cultivars for Nebraska

There are hundreds of onion cultivars and several dozen of these are available to home gardeners through seed catalogues, especially if you are interested in growing onion transplants or directly from seed. Select cultivars that are appropriate for your intended use — cooked or fresh, winter storage or seasonal use, etc. — and then evaluate them under your growing conditions. An assortment of seed catalogues can be found in NebFact 92-80, General and Specialty Mail-Order Seed Sources, available through University of Nebraska county extension offices or on the Internet at http://www.iainr.unl.edu/pubs/horticulture/nf80.htm. The following list includes a few of the onion cultivars that do well in Nebraska.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Color</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Harvest</td>
<td>Yellow</td>
<td>Medium round to flat shape</td>
</tr>
<tr>
<td>Early Yellow Globe</td>
<td>Yellow</td>
<td>More pungent flavor, good keeper</td>
</tr>
<tr>
<td>Downings</td>
<td>Yellow</td>
<td>More pungent flavor, good keeper</td>
</tr>
<tr>
<td>Ebenezer</td>
<td>Yellow or white</td>
<td></td>
</tr>
<tr>
<td>Chieftan</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Fiesta</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>First Edition</td>
<td>Yellow</td>
<td>Large bulbs, bronze skin, good flavor, good keeper</td>
</tr>
<tr>
<td>Buffalo</td>
<td>Yellow</td>
<td>Large bulbs, good storage</td>
</tr>
<tr>
<td>Bulksleye</td>
<td>Yellow</td>
<td>Large bulbs</td>
</tr>
<tr>
<td>Golden Cascade</td>
<td>Yellow</td>
<td>Very large bulbs, poor keeper</td>
</tr>
<tr>
<td>Olé</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Cache</td>
<td>Yellow</td>
<td>Medium to large bulbs, good keeper</td>
</tr>
<tr>
<td>Norstar</td>
<td>Yellow</td>
<td>Medium, good storage onion, light brown skins</td>
</tr>
<tr>
<td>Prince</td>
<td>Yellow</td>
<td>Medium, good storage onion, longer time to maturity than Norstar, rich brown skins</td>
</tr>
<tr>
<td>Bermuda</td>
<td>Yellow or white</td>
<td>Small, flattened, mild flavor, poor keepers</td>
</tr>
<tr>
<td>Sweet Spanish</td>
<td>Yellow or white</td>
<td>Large bulbs, mild flavor, fair keeper</td>
</tr>
<tr>
<td>Bennie's Red</td>
<td>Red</td>
<td>Large bulbs with mild flavor, pink to white interior color, poor keeper</td>
</tr>
<tr>
<td>Red Burgundy</td>
<td>Red</td>
<td>Large bulbs with mild flavor, poor keeper</td>
</tr>
<tr>
<td>Ruby</td>
<td>Red</td>
<td>Small, flattened, mild flavor, poor keeper</td>
</tr>
<tr>
<td>Candy</td>
<td>Yellow</td>
<td>Intermediate day length with early maturing large bulbs with a sweet, mild flavor</td>
</tr>
</tbody>
</table>

Onion Nutrition and Fertilization

Unlike most plants, onion roots rarely branch and do not have root hairs. Compared to other crops, their root systems are considered to be small and shallow and compete poorly with weeds. Therefore, it is important to keep them weed-free and cultivate carefully so the roots are not damaged.

Because of their shallow, coarse roots, onions do not obtain soil nutrients as efficiently as other crops. It is not necessary to fertilize onions until rapid growth is seen in the late spring. Then, a few light applications of nitrogen are better than a heavily fertilized bed, especially in sandy soils where nitrogen is easily leached. Be careful not to over-fertilize or fertilize too late in the season. Onions tend to develop thick necks, be soft and not store well when over-fertilized. Generally, long-day onions in Nebraska should not be fertilized after the first week of July to allow the plant time to mature before frost.
Onions grow best in a loose, well-drained soil with plenty of organic matter. A soil pH of 6.0 to 6.5 is best. Heavy clay or silt soils can be loosened by adding organic matter. Using raised beds will improve drainage and the soil will warm earlier in the season, promoting growth. Organic matter also can be added to sandy soils to improve their water-holding capacity. Use soil test results as a guide for lime and fertilizer applications. Arrangements for soil testing can be made through your local University of Nebraska Cooperative Extension office. Fertilizers of a 1-2-2 ratio (5-10-10, for example) are good for onion production as they promote good bulb development.

After bulbing begins, high temperatures and low relative humidity extending into the harvest and curing period are desirable. A constant, moderate supply of moisture while the bulbs are expanding is necessary for good quality bulbs. Onions that suffer a growth check may produce double or split bulbs, reducing the quality of the crop. A light mulch will help conserve moisture for uniform growth. Apply 1 inch of dry grass clippings, ground corn cobs or other mulching material after sets or transplants are planted or seeds have germinated and plants are several inches tall. Do not mulch heavily or hill soil around the necks when cultivating as this will encourage stem and neck rot. Provide consistent moisture, especially after bulbs begin enlarging in early June, but stop irrigating when the tops begin to fall over in August.

**Harvesting, Curing and Storage**

Harvest onions when about two-thirds of the tops have fallen over and dried. Handle carefully to avoid bruising and reduce storage rots. There is no truth to the old belief that one should break over the green onion tops to make the onion bulbs larger. The bulb is stored food that is transported from the leaves. If the leaves are knocked over or broken off, they cannot transport food to the bulb. Breaking over the tops also increases neck rot and storage problems. Better ways to hasten bulb maturity are to reduce irrigation and fertilize and/or undercut the roots with a shovel late in the season.

On dry, sunny, breezy days, onions may be pulled and left in the garden for a day or two to dry before they are taken to a curing area. It is best to put the onions on screens off the ground so that dew and moisture from the soil will not affect the bulbs. Bulbs should be protected from sunscald by covering with the tops, newspaper, or an old bed sheet. Separate out any bulbs with thick necks and use them first as they will not store well. Also separate out any bruised or damaged onions and don't try to store these as they are likely to become diseased.

Do not peel or remove the outer skins of onions until you are ready to use them. The skins help prevent moisture loss, bruising and help keep out insect and disease organisms.

Onions must be cured if they are to keep well in storage. Cure onions by placing them in a warm, well-ventilated area until the necks are thoroughly dry. If you have only a small crop of onions for storage, twist the leaves of each bulb a few times to pinch off the neck, or cut the leaves 1 1/2 inch above the bulb to hasten closure of the necks. This will reduce moisture loss and help prevent decay organisms from entering through the neck.

With warm temperatures, good air circulation and low humidity, curing should be completed within two weeks after harvest. After curing, onions are best stored in a very cool (close to 32°F), moderately dry area in ventilated containers.

If you wish to hang your crop, do not trim the tops, but braid them with a cord for reinforcement. Otherwise, place the onions in mesh bags, old nylon stockings, or slatted boxes. Do not store onions in plastic or paper sacks or solid-sided boxes because these restrict needed air circulation.

**Weed Control**

Dense weeds in and around the garden not only rob the crops of moisture, light, and nutrients, but also can harbor insects and create an ideal microclimate for the development of many diseases. Eliminate young weed seedlings with shallow hoeing or cultivating. Always pull or mow weeds around your garden area before they set seed. For large plantings, there are a few herbicides which can be used. Pre-emergence herbicides kill weed seedlings before they emerge from the soil. Examples of herbicides that can be applied to the soil prior to or at the time of planting include DCPA (Dacthal) and trifluralin (Preen or Treflan). Grasses may be controlled after they emerge by applying fluazifop-P-buty1 (Grass-B-Gone, Fusilade 2000) or sethoxydim (Poast or Poast Plus). Always read, understand and follow label directions before using pesticides.

**Onion Stresses — Wind, Pests and Diseases**

**Wind**

Onions are very sensitive to wind injury. Often they are the only plants up in the garden in March and early April and are exposed to the full force of our spring winds. Onion leaves are narrow and very tender. Sand and even silt particles can abrade the leaves, creating openings for disease organisms to infect the plant. Using a windbreak protects the onions from direct mechanical injury and allows the soil in the protected area to warm quicker resulting in more rapid growth. Planting a narrow row of annual rye grass along the north and south borders of the garden at the same time you plant onions will provide some protection. Wood
or plastic snow fencing also can be used to decrease the force of the wind on the young plants. Some gardeners will use a row of straw bales for early protection and then disperse the straw as a mulch in late June. Gaps in the row can funnel the winds resulting in even more wind injury than if no bales were placed for wind protection so be sure whatever you use is a continuous, although not necessarily solid, barrier. It is actually better if the windbreak can act as a fine sieve for the air since this creates a longer protected zone downwind from the barrier. Wind injury to onion leaves often looks similar to injury caused by thrips.

Insects

Thrips occur in all areas where onions are grown. There are two species, the onion thrip and the western flower thrip, that commonly attack onions, garlic, and related plants. Both species also feed on a wide variety of other vegetables, flowers, weeds and grasses. In Nebraska, thrips are a problem from mid-June on, especially in rural areas when wheat is drying.

Thrips are hard to see because adults are very small (1/25 inch long) and they usually feed deep in the neck of the onion leaves where they are protected from natural enemies and pesticide sprays.

Thrips puncture the outer layer of the leaves with their rasp-like mouthparts and feed on sap and bits of leaf tissue. Damage is seen on the leaves after they’ve elongated. Leaves develop silvery blotches, streaks or scratch-like markings. Light infestations tend to delay plant growth and retard maturity. Heavy infestations cause the leaves to become curled, crinkled and twisted, growth stops, and plants may die. Injury to the plant is more severe under hot, dry conditions. They produce several generations each summer. Hot, dry weather is favorable for increased activity and injury. Thrips are hard to control since they hide and feed between the compressed leaves.

Good cultural practices can limit onion thrips populations. Destruction of volunteer plants and crop residue after harvest eliminates many favorable overwintering sites. When injury is first noticed, apply two sprays of insecticide seven days apart. Because onion leaves have a waxy surface, it is important to add a surfactant to the insecticide if it does not already contain one. Spray with malathion or diazinon, covering the leaves and down into the neck where the insects hide.

Yellow-Striped Army Worm, a relative of the cutworm, appears in late May and early June. It chews on the outer surfaces of the foliage and then bores into leaves and hides inside. Their chewing causes the leaves to fall over prematurely. Birds inflicted more damage on the onions because they like to eat the caterpillars. You can minimize infestations of yellow-striped army worms by keeping the area free of weedy host plants.

Onion Maggots, larvae of the onion fly, tend to be a problem on soils high in organic matter during cool, wet springs. The fly overwinters as a pupa in onion debris or cull onions left in the garden. The fly emerges in late May or early June and lays eggs in soil at the base of onion plants. The fly is attracted by the odor of onions, and plants more than 12 weeks old are rarely infected unless the plant or bulb has been injured. There is no difference in susceptibility to onion maggot between transplants, sets, or seeded onions. The fly also tends to prefer to lay eggs where onion plants are closely spaced. A second generation of the fly emerges in early July. There may be as many as three generations each year in the midwest. Rotating the location of onion plantings is essential to control onion maggot. It also is very important to avoid physically injuring onion plants during cultivation or harvesting so that the flies are not attracted to the plants. Be sure to remove any damaged onions from the area. If you find onions infested with maggot, do not compost these plants! Put them in a covered trash container to remove them from your yard. Fewer problems are seen in onions grown on sandy loam soils or on raised bed where there is good drainage. Don’t mulch too heavily as that also makes the onions attractive to the flies laying eggs. Onion fly attacks only plants in the Aliaceae (onions, leeks, garlic, chives, shallots) and there is no known genetic resistance.

Diseases

Onion smut is a common disease in temperate growing regions, especially where onions are grown from seed. Most onions and related crops are susceptible to smut which attacks only juvenile plant tissue. Lesions appear as dark streaks seen first on the cotyledons soon after emergence. On older plants, the streaks initially appear as long blisters on the leaf surface. As the lesions mature, they turn brown to black and contain a black, powdery mass of spores that give the tops a sooty appearance. Diseased leaves may curve downward and usually are shed prematurely. Smut-infected plants normally are stunted and produce bulbs highly prone to soft rot.

The onion smut fungus survives in soil as resting spores that may remain dormant for several years. Infection occurs in spring when spores infect young germinating seeds before the seedlings reach the first leaf stage. The fungus grows with the plant and causes the streaks to appear as true leaves develop and mature. Infection is not likely to occur at soil temperatures greater than 80°F.

Because smut is a disease that attacks juvenile tissue, seed applied fungicides provide excellent control. Onion sets and transplants are not affected unless attacked in the field as seedlings. Therefore, purchase onion sets and plants from a reliable source to avoid purchasing pre-infected plants or sets.
Bacterial Soft Rot occurs mainly on mature bulbs in storage. This disease also can develop on onions in the garden with continued irrigation or rain when the leaves are drying. The bacterium enters the bulb through wounds as a result of mechanical injury, insect injury, or sunscald. Affected scales appear water-soaked and may be light brown or gray. As the rot progresses, scales become soft and sticky and the bulb interior breaks down. This rot usually has a foul smell associated with it and liquid can be squeezed from the neck of infected bulbs.

To control bacterial soft rot, avoid damaging the bulbs during harvest and cultivation and properly dry bulbs before storage. Avoid overhead irrigation when possible, especially when leaves are drying.

Sour Skin and Slippery Skin are bacterial diseases. Symptoms appear as one to two leaves that turn light brown in color, with a watery rot developing at the base of the discolored leaves that proceeds into the neck. These will be in the center of the leaf cluster if caused by the sour skin pathogen. Scales become infected as the disease progresses. The outermost or inner (center) bulb scales usually are not affected with sour skin. This is a differentiating characteristic from slippery skin for which the inner most scales are infected first.

To control these two bacterial diseases, avoid damaging the bulbs during harvest and properly dry bulbs before storage. Cut tops are an excellent point of entry for these bacteria. Avoid overhead irrigation as bulbs approach maturity.

Purple Blotch mainly infects the leaves. Older leaves are more susceptible than younger leaves. Leaf lesions usually have white centers and the edges of the lesions are brown to purple with yellow tissue around the lesion. As the lesions mature, dark rings of fungal spores form throughout the lesion. Severe leaf infection can result in the bulb being infected. Initial bulb infection appears bright yellow, but turns a characteristic dark red as symptoms progress.

Prolonged leaf wetness can lead to Purple Blotch. Avoid overhead irrigation and crowding plants if this disease has been a problem in your garden. If overhead irrigation is necessary, apply it in the morning. Under high disease pressure and wet conditions, a broad spectrum protective fungicide can be used.

Basal Rot is apparent by symptoms of yellowing, curling and necrotic leaf tips. As symptoms progress, entire leaf blades wither and decay. Infected roots are dark and sometimes hollow. White fungal growth (mycelium) may be present at the base of the bulb and infected plants pull easily due to a stunted, decayed root system.

Pink Root is similar to Basal Rot. The name “pink root” describes the most obvious symptom of this disease. Roots become deeper pink to red as symptoms progress. Severely infected plants appear to suffer from nutrient deficiencies or drought (leaf tips being white, yellow, or brown). Early season infection can result in early bulb ing and plants with pink root are easily pulled, as with Basal Rot.

Basal Rot and Pink Root can be managed by growing more tolerant cultivars in gardens with a history of these disease problems. Resistant cultivars are available for Pink Root. These are both soil-borne fungi that can be present for many years in the garden. Dipping seedlings into a fungicide treatment at transplanting can reduce basal rot. Early planting can reduce both diseases, as the pathogens are not as active at soil temperatures below 75°F.

Other Cultural Problems

Split or double bulbs are caused by dry soil during bulb formation. Irrigate regularly to provide 1 inch of water per week as needed to supplement normal rainfall. Stop irrigating when the tops begin to turn yellow and fall over. Some cultivars tend to have more double centers than others when grown under the same conditions and large bulbs are more likely to form doubles than smaller bulbs. Carefully read the cultivar descriptions in seed catalogues if single-centered bulbs are important for you.

Very small bulbs may be caused by planting too late for the cultivar, dry soil, planting too close together, and/or weed competition.

Onions and Health

Onions have been used in folk medicine for thousands of years to treat many different ailments. Today, scientists continue to research the role of onions in human health. Studies show that regular consumption of onions can help prevent heart disease by lowering cholesterol, lowering blood pressure and helping to thin the blood. You can find more information on scientific studies at libraries, through your physician, pharmacist, or health-care provider, and by searching on the World Wide Web.

Onions contain allin which is broken down by allinase into allicin, and other sulfur-containing compounds. Ajoene is a breakdown component of allicin and helps to prevent clumping of platelets. Quercetin is a bioflavonoid found in onions, especially the outer rings of red and yellow onions. As an antioxidant, quercetin inhibits the production of free radicals (oxidents). In the cardiovascular system, it is believed to prevent free radicals from oxidizing low-density lipoproteins (LDL) or “bad” cholesterol.

2Ibid
This brief overview of onions in human health is meant to increase your knowledge of research in the role of plants in human health. Because everyone is different, a physician must diagnose conditions and supervise the use of diet, herbs, or supplements to treat individual health problems. You should talk with your doctor before adding supplements or large amounts of onions or onion extracts to your diet. Since onions and garlic can reduce blood clotting time, one should be especially careful if one already takes prescription anticoagulants.

Pet owners should be aware that, while many animals like the flavor of cooked garlic and onions, they can make cats, dogs, horses, sheep, cattle and other animals very ill. Compounds in onions and garlic destroy the red blood cells of many animal species causing hemolytic anemia. Prolonged or exclusive feeding of onions may cause death of the animal.

**Other Onions**

**Green Bunching Onions (Scallions)**

Any standard onion cultivar can be used for producing green onions. For the home gardener, green onions are usually the by-product of thinning overcrowded rows. Onions can be used as green onions starting about 30 days after planting if grown from plants or sets. The cultivars 'Southport White Globe' and 'White Sweet Spanish' are often grown for green onions rather than bulbs.

True green bunching onions are cultivars of *A. fistulosum* that do not form bulbs. 'Ishikura', 'Evergreen White Bunching' or 'Welsh Onion' ('He Shi Ko') are examples. They are winter hardy but are usually grown as an annual crop. In Japan and China, transplants are planted in a furrow and soil is mounded around the plants to blanch the elongated pseudostem or basal part. If not blanched, they are grown for the green tops. Although we are accustomed to scallions or green onions with a white base, cultivars are available that have an attractive purple or reddish base. The cultivar 'Bunching', is the result of a chance cross between *A. fistulosum* and *A. cepa* and will form small bulbs or swollen leaf bases.

**Egyptian-, Walking-, Top- or Tree-onions**

Those plants known as Egyptian-, walking-, top- or tree-onions are in another group within *Allium cepa*. They produce clusters of small bulbs (bulbils) at the top of the seed stalk in late summer and are exceptionally winter-hardy. The bulbils often sprout while still on the seed stalk and when the stalk falls over, they begin to grow. Hence, they "walk" across the garden and may spread into a large patch. The bulbils also may be harvested and used as tiny onions, for example, in salads. Although these may form flowers, they are often sterile. Propagation is primarily by using the bulbils, which are planted in the fall.

**Multiplier Onion or Potato Onion**

The potato or multiplier onion (*Allium cepa var. solanum*) also is grown from vegetative parts rather than true seed. The underground portion is a compound bulb formed from the segregation of a large mother bulb. Each bulb in the compound bulb produces six to 12 plants. The bulbs are about the size of a shallot, flattened on one end. The multiple bulbs are enclosed in the sheath of the mother bulb until they are well developed. Commercially, their principal use is to produce early green bunching onions. In the home garden, they can supply a never ending source of onions if allowed to grow continually.

Multiplier onions are planted in the fall, overwintered with some mulch protection, and brought into production in the early spring. Due to this method of culture, the onions are referred to as "winter onions."

Seedlings can be eaten in the fall, but are commonly left until the following spring. If picked before flowering, these onions make an excellent green onion for use in soups and salads. The mother plant can be consumed; however, the seedlings are much preferred. The mother plant can be left to provide a continuous source of new seedlings. Like chives, perennial onion plants produce offshoots. Therefore, the patch should be renewed by division every four or five years to control and rejuvenate its growth.

**Pearl Onions.** True pearl onions are classified as *Allium ampeloprasum* (Ampeloprasum group) and are distinctly different from regular onions because they form just one storage leaf and so true pearl onions do not have rings. Commercially, pearl-size onions often are produced in the north by planting short-day cultivars of common onions such as 'Grano' and 'Crystal Wax.'

**Shallots (Allium cepa var. ascalonicum)** are hardy members of the onion family and have a mild flavor prized by gourmet cooks. They are often called for in French cooking and may be used in the green onion stage or as bulbs. Originating from the beginning of Christianity, they are likely only a modification of a cultivar of onion. Shallots are cultivated like onions, though they may be planted in the fall or early spring and mature earlier in the summer. There are a few listed cultivars of varying pungency and ability to overwinter, but often they are simply listed as "shallots." Planting stock may be purchased from garden stores, seed companies or the produce section of some grocery stores.

Shallots produce a cluster of bulbs from a single planted bulb. To plant, divide the clump of shallots into individual bulbs and separate them by size. Plant the small bulbs and use the large bulbs for cooking. Plant
early in the spring, as soon as the soil can be worked. Like other onions, shallots thrive in rich, loose soil. Plant the individual bulbs 1 to 1 1/2 inches deep and 4 to 5 inches apart, or if in wide rows, space the bulbs 5 inches apart in all directions. Shallot bulbs develop on top of the ground. Do not cover with soil when cultivating.

Shallots also can be planted in mid- to late-October. Plant the bulbs 2 to 3 inches deep and mulch lightly. Shallots are very hardy and will survive most winters without a heavy mulch.

Shallots may be pulled as green onions when their tops are 6 to 8 inches high. Each bulb ("scallion") will be 3/8 inch or larger in diameter. For dry bulbs, allow the tops of the plants to die down in July. Harvest and handle in the same manner as dry onions. The dry bulbs may be placed in a mesh bag and stored under cool, dry conditions. Shallots keep well and are easily stored until planting time in the fall or spring.

Chives

Chives (Allium schoenoprasum) are a mild-flavored member of the onion family often considered more of an herb than a vegetable. They have been grown as a crop in Europe since the 16th century. The fine-textured foliage is chopped and used in soups, stews, salads, and other recipes. The bulb is small and not usually consumed. Chives also are used as an edible ornamental flower, bearing lavender blossoms in spring to early summer which can be used to garnish salads and other dishes.

Chives are easily started from seeds, or clumps may be divided and transplanted in the spring. A few plants or small patch will be sufficient for the average family. They do not spread rapidly and seldom become a weed. As chives multiply by offshoots, a patch will begin to crowd itself out as it spreads. The plants may lose vigor and die. Rejuvenate a crowded patch by dividing the plants, thinning them and/or transplanting them to another area of the garden.

Small amounts of chives may be snipped off for fresh use throughout the growing season. If you plan to freeze or process the chives, remove all growth about 2 inches above the ground. This should be done only once a year, before mid-July, to allow the bulbs to replenish their food reserves before winter. Where winters are severe with little snow cover, a 2 inch layer of mulch can be placed over the patch in late fall to help prevent winter injury.

Garlic Chives or Chinese Chives (Allium tuberosum) are similar to chives except their leaves are flat and they have a mild garlic flavor. Plants grow in clumps that spread by tillering. The leaves are harvested when they are about 8 inches long. The flower stalks and flowers are also eaten, ideally when about 14 inches tall and the buds are still green and closed. These are used in stir-fry dishes or soups to add a mild garlic flavor. The bulbs of garlic chives are very small and of no consequence. The flowers are fertile and scatter seeds, so they often become weeds. The culture is the same as for chives but, to reduce the problem of self-seeding, prune off the flowers before they produce seed.