



Growing Garlic in Alaska

Compiled by Julianne McGuinness

Garlic is native to central Asia. The ancestry of cultivated garlic is not definitively established, but it is thought to be descendent from the species *Allium longicuspis*, which grows wild in central and southwestern Asia.¹ It has been a culinary and medicinal staple in Asia, Africa, and Europe (especially the Mediterranean region) for over 6,000 years.^{2, 3}

Over many centuries of selection and cultivation, garlic has mostly lost the ability to produce fertile seeds - indeed, in some varieties, flower stalks and flowers are not even formed. However, recent research shows that some varieties under the right conditions will produce true garlic seed. Propagation from seed will eventually improve genetic diversity in the crop. While true garlic seeds are difficult to produce, there is still a wide array of cloned varieties to choose from, selected over many years and via some random and interesting mutations.^{4, 5}

Garlic is generally lumped into two main categories: hardneck and softneck. Hardneck varieties (*Allium sativum* var. *ophioscorodon*) produce a flower stalk, or, technically, a scape, and are often termed "topsetting" or "bolting" varieties. These types are most closely related to wild garlic. Softneck types do not have this woody stalk. Most "supermarket" garlic is of the softneck variety.

DNA analysis illustrates 10 major garlic types within these two categories; but specific characteristics can vary significantly by location. Climate can have a significant impact on garlic flower stalk formation and taste. For example, a variety may be considered a softneck in one location, but in other locations it may produce a flower stalk. Within each variety are named selections or strains.⁶ Since there is no standardization, some garlic seed producers will occasionally rename a particular selection, leading to more confusion. (To make matters even more confusing, recent genetic research suggests that some named varieties are actually one and the same...) Anyway - It is best to try out several different varieties/selections for a few years and select those that do best in your area.

Typical hardneck varieties are: "Rocamboles", "Purple Stripe", "Glazed Purple Stripe", "Marbled Purple Stripe", and "Porcelain". Other unique varieties that often produce a scape are "Asiatic", "Creole", and "Turban".

Softneck varieties (*Allium sativum* var. *sativum*) do not produce a seed stalk. These varieties are commonly used in California for commercial mass production. While hardneck varieties generally do better in northern regions, there are some softneck varieties that are also suitable for cold climates. Softneck varieties are considered to be the most domesticated varieties due to minimal flower stalk and bulb production. They are generally more productive than hardnecks because all the energy goes to producing a bulb rather than a bulb and flower stalk. In cold climates, however, hardneck varieties can be just as productive as or more productive than softneck varieties. In some softneck varieties a partial flower stalk may be produced and bulbils will form directly above the bulb. This will often occur in Artichoke varieties following winters with poor snow cover and below average temperatures. Each bulb of a softneck variety generally contains between 10 to 40 cloves arranged in multiple layers somewhat like an artichoke. Softneck garlic generally has a much longer shelf life than hardneck garlic and

¹ Salunkhe, D.K.; Kadam, S.S. (1998). Handbook of Vegetable Science and Technology. Marcel Dekker. p. 397.

² Simonetti, G. (1990). Schuler, S., ed. Simon & Schuster's Guide to Herbs and Spices. Simon & Schuster, Inc

³ Block, E. (2010). Garlic and Other Alliums: The Lore and the Science. Royal Society of Chemistry.

⁴ Etoh, T., and P. W. Simon. 2002. Diversity, fertility and seed production of garlic. In *Allium Crop Science: Recent Advances*. Ed. H. D. Rabinowitch and L. Currah. New York: CAB International.

⁵ Meredith, T. J. 2008. *The Complete Book of Garlic: A Guide for Gardeners, Growers, and Serious Cooks*. Portland, Oregon: Timber Press

⁶ Engeland, R.L. (1991) *Growing Great Garlic: the definitive guide for organic gardeners and small gardeners*. Filaree Productions.



Growing Garlic in Alaska

Compiled by Julianne McGuinness

typically can be stored for six to eight months without significant deterioration. They also are easy to braid. Typical softneck varieties are "Artichoke" and "Silverskin".

Major garlic types and varietal descriptions:

Rocamboles – Moderately sized plants (3 to 4 ft tall with scape uncurled), with a scape that coils 2-3 times before straightening out. Bulbils are numerous and generally a purple color. Bulbs are off-white with purple streaks. Clove skins are brownish and easy to peel. Bulbs store for about 4-5 months. Generally performs well in cold climates. Prone to double cloves. Some example selections include: German Red, German Brown, Spanish Roja, Russian Red, Killarney Red, Montana Giant

Purple stripe – Moderately sized plant (3 to 5 ft tall with scape uncurled), characterized by a scape with $\frac{3}{4}$ of a coil and others just form a downwards U before straightening out. Bulbils are numerous and generally a purple color. Bulbs have purple streaks. Clove skins are brownish and more difficult to peel than rocambos. Bulbs store for about 5-7 months. Generally performs well in cold climates. A typical bulb has 8 to 12 cloves and one pound of garlic will supply about 60 cloves. Double cloves rarely occur. Some examples include: Chesnok Red, Persian Star

Glazed Purple Stripe – Similar to Purple Stripe except clove color is more intensely purple and fewer cloves per bulb. One pound of garlic will supply about 60 cloves. Scape tends to form a full coil before straightening out. Examples include: Purple Glazer, Red Rezan

Marbled Purple Stripe – Bulbs actually look more similar to Rocambos than Purple Stripes, but genetic analysis places them closer to Purple Stripes. Scapes tend to be weak in some strains and form somewhat random coils. A typical bulb has 4 to 7 cloves and one pound of garlic will supply about 50 cloves. Plants are very vigorous in cold climates. Examples include: Siberian, Brown Tempest, Krasnodar Red

Porcelain – Large and vigorous plants (4 to 6 ft tall with scape uncurled). Characterized by a scape with loose and somewhat random coils before straightening out. Bulbils are numerous, small, and generally a white color. Bulbs are large and typically contain 4 to 6 cloves. This characteristic is great for cooks, but growers need to save more of their crop for seed. Clove skins smooth and white. More difficult to peel than Rocambos. Double cloves are rare. Bulbs store for about 5-7 months. Generally performs well in cold climates. One pound of garlic will supply about 35 cloves. Examples include: Romanian Red, Georgian Crystal, Music, Polish Hardneck, Zemo, Georgian Fire, Northern White, German White, Krasnodar White

Artichoke (not recommended for Alaska) – Usually a softneck, but may partially bolt following cold winters. In some cases the bulbils form just above the bulb making the bulb unmarketable. In a mild winter only 1-2% will bolt. In a cold winter without snow cover, 70 to 100% will bolt. Bulbils that do appear are usually purple. Bulb color is whitish to purple blush. Bulbs typically contain 12 to 20 cloves and one pound of bulbs will supply about 80 cloves. This is usually the most productive softneck type in cold climates. Cloves are difficult to peel. Bulbs store for 6 to 9 months. Selections include: Inchellium Red, California Early, Susanville, California Late, Early Red Italian, Machashi, Red Toch

Asiatic – A shorter garlic plant, @ 3 ft tall when the scape is mature. Originally thought to be closely related to artichoke varieties, but further genetic analysis suggests it is a hardneck type. A flower stalk almost always forms under cold climate conditions. Scapes generally do not curl and may be somewhat drooping with a long characteristic bulbil capsule. Bulbils are much larger than those produced on other garlic types and are usually dark purple. Four to eight large cloves per bulb - one pound of bulbs will provide about 50 cloves. Double cloves occur in this type. Cloves are brownish and bulb color varies from white to pink to purple striped. Clove skins are



Growing Garlic in Alaska

Compiled by Julianne McGuinness

somewhat tight making it difficult to peel. Generally they perform well in cold climates. Cloves are very prone to splitting through the bulb skins if harvested too late. Bulbs typically can be stored for 5 to 7 months. Selections include: Asian Tempest, Japanese, Wonha, Sakura, Pyong Vang

Turban – Genetically related to softneck types, but may form a flower stalk under northern conditions. Scapes are weak and tend to form a downwards U. The purple bulbils are numerous and small. There are usually 7 to 11 cloves per bulb and one pound of bulbs will supply about 60 cloves. Double cloves are not common in this type. Cloves are brownish and bulb color is usually dark purple striped. Clove skins are loose making it easy to peel. This type does not store well and typically only lasts 3 to 5 months. The advantage of this type is that it matures 1 to 3 weeks earlier than most other garlic types. Selections include: Red Janice, Blossom, Xian, Tzan, Chinese Stripe

Creole (not recommended for Alaska) – Genetically related to softneck types, but may form a flower stalk under northern conditions. Best suited to warm climates and mild winters. However, the dark purple clove skins and generally sweeter taste make this garlic type unique and desirable. Bulb size can sometimes be improved by planting early in the spring as soon as the ground thaws. Clove skins are somewhat tight making peeling difficult. Bulbs typically can be stored for 6 to 8 months. Examples include: Ajo Rojo, Burgundy, Creole Red

Silverskin (not recommended for Alaska) – A true softneck type, with no flower stalk - best for braiding. Rarely, flower stalks will form following a cold winter. Clove numbers range from 8 to 40 - one pound of bulbs will supply about 90 cloves. Silverskin garlic is best for warm climates and mild winters. Bulb size is small (usually less than 2 inches) especially after a cold winter... but can be larger than 2 inches following a mild winter. Because of their weak necks, the plants will lay down (lodge) about one week before harvest. Bulb size can sometimes be improved by planting early in the spring as soon as the ground thaws. Clove skins are somewhat tight making peeling difficult. Bulbs typically can be stored for up to one year. Selections include: Silver White, Nookota Rose, Mild French, S&H Silver, Idaho Silver

Note: Elephant garlic is not true garlic, but a type of leek, *Allium ampeloprasum*. It grows much larger than true garlic with each bulb of five to six cloves weighing as much as one pound. The taste of elephant garlic is milder than true garlic, but in cold climates it may develop a more pungent taste.

Planting Tips / Guidelines for Growing Garlic in Alaska:

- **WHEN TO PLANT:** Plant garlic in the fall in Alaska... about 4 weeks before the ground freezes solid (preferably before ice crystals start forming in the soil). In the most extreme climates, Zones 1 & 2, garlic may be planted in Spring, but smaller yields and bulb sizes will result.
- **SOIL:** Fertile. Fluffy soil with lots of organic matter is ideal for garlic. Dense, clay soils should be amended with compost before planting; if possible, add green manures prior to planting.
- **PLANTING:** Break bulb into individual cloves, retaining the bulb wrapper on each. If you tear a wrapper, eat that clove rather than planting it, since it will be prone to mold and rot in the ground. Small cloves grow small bulbs, so plant the big ones and eat the small ones. Plant root side down; 3-4 inches deep, and mulch with leaves or straw, immediately after planting. In spring, remove mulch as soon as possible, to expedite soil warming. Space garlic plants a few inches apart for optimal bulb development.
- **GROWING:** Garlic does not do well with competition for nutrients, so keep it well weeded. Use care around shallow roots when cultivating. Fertilize lightly as soon in early spring. Side-dress with chicken manure, seedmeal or strong compost. Use high-nitrogen foliar fertilizer, sprayed every ten days to two

Compiled by Julianne McGuinness

weeks. Cease fertilizing once bulbing begins, to ensure the best quality bulbs. During the prime growth stages, keep soil moist, but reduce watering as the season progresses to avoid bulb rot.

- **SEED STALKS:** Hard-neck varieties put up a tall, woody flowering stalk (scapes, aka “whistles”) with bulblets at the top. Cut scapes off when curls form, so as to optimize energy devoted to bulb formation (scapes make great pesto!).
- **HARVEST:** Choosing when to harvest garlic is an art. Dug too soon, bulbs won’t have sufficient protection from skins formed around each clove. Hard-neck bulbs, dug too late, will begin to divide and spread apart in the soil. Harvest when plant leaves are about 40% yellowed – you can dig a few plants to check. (All parts of the garlic plant are edible in all stages, so relish them at any stage, even if dug too early or late!)
- **HARVESTING TECHNIQUE:** In nice fluffy soil, garlic plants may be pulled by hand, but it is usually best to use a gentle tool to loosen the bulb. Gently brush soil from around the roots, and lay plants in a dry, shady spot to cure. **Never wash garlic**, and keep moisture to a minimum to avoid rot and mold.
- **CURING:** Garlic stores longer if it is cured with its stalk & leaves attached. Good air circulation is necessary. Trim roots and cure from 3 weeks to 2 months, depending on humidity and air circulation. Use a fan in the curing shed if necessary. Clean bulbs gently with a soft bristle brush, preserving the papery skin.
- **STORING:** Hang bulbs in net sacks, with good air circulation on all sides. Alternately, hang the dried bunches, or make and hang braids of the soft-neck types. Ideal storage conditions are 45-55°F. at 50% relative humidity. Storage below 40°F will cause garlic to sprout. Note: garlic grown in Alaska usually has fewer bulb wrappers (leaves), so it may not store as long as warmer-climate garlic.

Further Reading & Information

Aaron, C. (1997) *The Great Garlic Book: A Guide with Recipes*, Ten Speed Press.

Engeland, R.L. (1991) *Growing Great Garlic: the definitive guide for organic gardeners and small gardeners*. Filaree Productions.

Engeland, R.L. (1995) Supplement to the book, "Growing Great Garlic." Filaree Productions.

Kamenetsky, R. (2007) Garlic: botany and horticulture. *Hort. Reviews* 33:123-172.

Koch, H.P. and L.D. Lawson (1996) *Garlic: The Science and Therapeutic Application of Allium sativum L. and Related Species*. Williams & Wilkins.

Meredith, T.J. 2008. *The complete book of garlic: a guide for gardeners, growers and serious cooks*. Timber Press

Rabinowitch, H. D. and L. Currah (2002) *Allium Crop Science: Recent Advances*. CABI publishing.

Schwartz, H.F. and S. K. Mohan (1995) *Compendium of Onion and Garlic Diseases*. APS Press.

Volk, G. M., A.D. Henk, C. M. Richards (2004) Genetic Diversity among U.S. Garlic Clones as Detected Using AFLP Methods. *J. Amer. Soc. Hort. Sci.* 129:559-569. <http://www.garlicseedfoundation.info/JASHSgarlic.pdf>

Useful Website: <http://www.garlicseedfoundation.info/index.htm> More information about garlic