

GROWING GARLIC

FROM BULBILS

By Paul Pospisil

Growing garlic from bulbils, the small round bulbs found in the scapes or stems of garlic, is generating new interest. The practice was brought to Canada by European immigrants, according to anecdotal evidence. By planting bulbils, growers can rejuvenate garlic strains and have a back-up source of garlic in case the bulbs die or become infected with disease.

Some growers use bulbils to develop a supply of planting stock at very low cost and to avoid the transmission of soilborne diseases.

Usually, garlic is reproduced vegetatively by planting cloves from the underground bulb. Vegetative reproduction is sometimes referred to as cloning. The cloves are planted, generally in the fall,

and each clove produces a bulb the following summer. Garlic also reproduces from bulbils produced in the scape (topset) of hardneck garlic or along the false stem of softneck. Bulbils are tiny, undivided bulbs that can be used as seed. Garlic does not have fertile flowers so it does not produce a true seed.

Garlic 101:

Bulb (head): the underground, rounded organ of vegetative reproduction in plants, such as the tulip, onion and garlic, containing the stored food for the reproductive shoot inside. The garlic bulb is divided into segments called cloves.

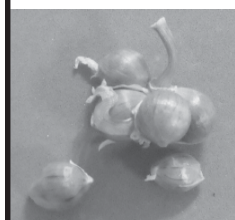
Bulbil: a small, round secondary clove, which can be smaller than a grain of rice or as large as a chickpea, produced in the scape of hardneck garlic or along the false stem of softneck.

Clove: a segment of a bulb of garlic. In standard garlic cultivation, cloves are separated and planted individually.

Head: another name for a garlic bulb.

Round: small undivided bulbs that often result from planted bulbils.

Scape: a flowerstalk that emerges from hardneck garlic. Unless the grower is saving bulbils, scapes are usually removed and either eaten or composted.



Bulbil capsule of the Purple Stripe Czech Broadleaf garlic.

Successive replanting of the progeny from the bulbils produces a strain superior to that produced from the cloves of the original mother plant.

Bulbils vary in size and appearance. In Porcelain garlic, for example, there may be up to 150 tiny, grain-size bulbils in a single capsule. On the other hand, Rocamboles may have only four bulbils, each the size of the fingernail on your little finger. The length of time to grow a full-size bulb varies considerably between varietal groups (see pg. 13).

Ted Maczka, the Fish Lake Garlic Man, showed that successive replanting of the progeny from the bulbils produces a strain superior to that produced from the cloves of the original mother plant. Our own early trials at Beaver Pond Estates support these findings. We initiated a long-term trial in 1999 to determine whether or not improved garlic strains can be developed through bulbil propagation.

Beaver Pond Estates Bulbil Project

In the first year, bulbils were allowed to mature on the plant and collected. They were planted in the fall around the same time as garlic bulbs, and harvested

the following summer. The second cycle was started with rounds (i.e. bulbs from the harvest of the planted bulbils), again planting in the fall. Bulbils were planted 1 inch deep, rounds at 2 inches and cloves at 4 inches.

Successive cycles used the rounds or bulbs, whichever the strain produced, for replanting. In each cycle, the best samples were selected for planting. A control sample of the same strain was grown using cloves from the mother plant.

Plants grown from bulbils had less tip yellowing, suggesting less

disease in the plant, compared to plants grown from cloves. Generally, the larger bulbils from the Rocamboles produced larger rounds in the first year than did the tiny bulbils from Porcelains or Siberians. Not all bulbil-grown plants produced larger bulbs than clove-grown ones. As well, replicating the process with a new set of bulbils did not necessarily produce the same results.

Conclusions cannot be made from a single experiment of growing a full-size bulb from a bulbil. Sound data is based on



Bulbil capsule of the Turban Artichoke, specifically Lucian's Sicilian garlic.

Growing garlic from bulbils

Varietal group*	Sub-variety	Example of strain tested	No. of bulbils per stem or capsule	Years to grow full-size bulb	Remarks
Porcelain		Majestic	100–150	4–5	Produces rounds the first and second year; rounds or small, divided garlic the third year.
Rocamboles		French	4–9	2–3	May produce either rounds or small bulbs the first year.
Purple Stripe		Czech Broadleaf	3–6	1–3	Large bulbils have produced 2-inch bulbs in first year, but usually do so in 2–3 years.
Purple Stripe	Marbled	Siberian	100–150	4–5	Some Marbled garlic appear identical to Porcelains.
Purple Stripe	Glazed	Purple Glazer Red Rezan	10–50	3–5	Inconclusive results.
Artichoke	Standard	Endurance F4 Italian	1–5	2–3	About ¼ to ½ of plants develop stem bulbils. When planted, these tend to produce large rounds the first year.
Artichoke	Asiatic	Pyong Vang Sakura	3–10	Unknown	Weak bolting. Initial trials inconclusive.
Artichoke	Turban	Chinese Purple Xian	4–100 (?)	Unknown	Weak bolting. Initial trials inconclusive.
Silverskin		F40	variable	Unknown	Occasional stem bulbils, some years develop topsets or scapes.
Silverskin	Creole	Native Creole	5–30	Unknown	Inconclusive data.

*For details on varietal groups, see www.gourmetgarlicgardens.com/overview.htm.



Bulbil capsule of the Porcelain Majestic garlic.

repeating the experiment numerous times. It was also obvious that help was needed if the information was to be gained during my lifetime. More data need to be collected from different regions and that data presented in a practical and usable form. I

appealed to growers across Canada for help by means of the Bulbil Project (see box below.) I am still looking for more participants from some regions.

I send packages of bulbils to participants along with instructions for growing and recording. Project growers are asked to keep basic records (e.g. dates, quantities, sizes and/or weights, and observations).

Other bulbil projects

I'm pleased that growers across Canada are becoming interested in this advanced growing method.

Sonia Stairs and Henry Caron of Boundary Garlic are now promoting and selling bulbils as part of their annual offering of garlic planting stock.

The Garlic Growers Association of Ontario has been struggling with the problem of disease in their Music strain of garlic since devastating commercial crop losses in 1987 and 1988. According to Becky Hughes of New Liskeard Agricultural Research Station, losses from virus-infected garlic are estimated to be between 25–50%. A government-funded program to produce clean seed was initiated using the tissue culture method and a bulbil growing trial.

The Bulbil Project ...

... at the Small-Plot Garlic Variety Trials, Beaver Pond Estates, Maberly, Ontario

The bulbil project needs your help!

Will you help? Growers and gardeners, especially home gardeners, are invited to participate. A grower from each province or growing zone is needed.

Purpose: To grow garlic by the bulbil method in as many regions and soil conditions across Canada as possible to validate the utility of this growing technique in maintaining a strong, healthy stock of garlic for planting.

What do you need to do? Plant different types of garlic bulbils. Harvest, weigh and measure the first year's crop, and replant. Continue with this until you have full-size bulbs (i.e. at least two inches in diameter).

Each year, record the planting and the harvest, as well as any growing observations. Growing instructions and record forms are provided. Your information will be consolidated with other reports into a database that can be used by growers. I will provide a set of five bulbil strains to start or you may use bulbils from your own garlic. The bulbils are free but I ask for a small contribution to help pay the mailing costs. Any garlic you grow from this project is yours to keep. If you already grow from bulbils, your information would be appreciated.

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How to grow garlic from bulbils

If you are going to collect bulbils, do not remove the scape. Let it mature on the plant until after the harvest of the other bulbs (i.e. those with scapes removed). This takes an extra week or two. You will likely forfeit the underground bulb, as it will be much smaller.

Carefully take the capsule from the scape and remove the bulbils from it. Store in a dry place until planting time.

Plant bulbils at the same time as you plant garlic (October in our region). Bulbils are planted 1-inch deep about 2 inches apart. You may plant directly in the garden



Cloves of the Asiatic garlic.

but you risk infecting the new garlic with soilborne disease and losing the first-year plants among the weeds. It's preferable to plant in containers filled with sterilized soil or potting mix. Bury these in the garden, slightly above the soil surface. Plant at least ten bulbils of each type. Mulch with straw. Next spring, weed and water the plants as you would with regular garlic.

Harvest the plants the following summer about the same time as garlic bulbs. Clean and cure the tiny crop. Some will have grown 'rounds,' small, undivided bulbs, while others may form a divided bulb in the first year. Plant your best ten cloves or rounds. Rounds and tiny cloves are planted two inches deep. Containers with sterilized soil are recommended. By the second or third harvest, you should be getting fairly good-sized bulbs,



Mary Lou bundling scapes for market. Unless you plan to collect bulbils, scapes are usually removed to enable bulbs to grow bigger. The scapes are a seasonal garlic delicacy.

depending on the variety. I've had stubborn Porcelains refuse to grow anything but small rounds for four years before finally agreeing to form a divided bulb.

When you are in your last planting cycle, select some clove-grown bulbs (same strain) of the same size and weight and grow alongside the bulbil-grown ones. Both should be planted in the garden rather than in containers. Compare disease indications, size and colour of plant, and, following harvest, bulb size.

Good luck with your bulbil planting experiments. They will start you on the way to learning more about this most fascinating of vegetables.

Paul Pospisil, Master Gardener Emeritus, is an organic gardener. He and his wife Mary Lou run their farm, Beaver Pond Estates, near Maberly, Ontario. They conduct growing trials on garlic and publish The Garlic News, the only Canadian quarterly dedicated to the growing and use of garlic.

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