

Hardneck Garlic: Production Information

Market Research & Economic Feasibility on Specialty & Alternative Crops in the Bulkley-Nechako Regional District

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Crop Varieties

There are several groups of hardneck garlic, with various varieties within each group that would be suited to the BNRD. A few include:

- Rocamboles Group
 - Baba Franchuk
 - Puslinch
 - German Red
- Marbled Purple Stripe Group
 - Red Russian
 - Metechie
- Purple Stripe Group
 - Chesnok Red
- Porcelain Group
 - Music
 - Zemo
 - Northern Quebec
 - Susan Delafield

Crop Overview

Garlic (*Allium sativum*) is an herbaceous perennial that matures into a stem surrounded by cloves covered in a paper-like skin. Global garlic production is 10 million tonnes/year with a wide range of uses including as a food ingredient, flavoring, a natural health product or phytomedicine, and as a natural pesticide.

Hardneck garlic varieties are hardier, grown in smaller quantities, have stronger colours and more intense, diverse flavour profiles, and therefore have greater value than softneck cultivars. In early spring hardneck garlic bolts to produce a flowering stem called a **scape**. Removal of the scape is recommended for maximal bulb growth, and can be sold fresh, similar to fresh chives.

Alternatively, the scapes can be left to produce **bulbils** which can be used for propagation; this may become necessary as finding sufficient bulbs for large-scale production can be challenging. However, propagation using bulbils require three-five years (depending on variety) of growth before a full bulb is produced.

Geographic Suitability

This project was developed for the Bulkley-Nechako Regional District, but is applicable to the central-interior of B.C.

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Growing Considerations

- Hardneck garlic thrives in colder climates where cloves are planted in the fall (late September) and over-wintered.
- Repeated tilling is recommended for seed bed prep to ensure a loose-textured, well-draining soil to a depth of 15cm.
- Winter kill has been an issue for seed that is not adapted to local conditions; mulching is one adaptive approach to manage for winter kill, especially in areas prone to freeze before snow fall.
- Disease can be problematic with garlic, and a four-year rotation is suggested.
- Garlic requires 1-2" of water on a weekly basis (note: watering is reduced as the crop nears harvest mid-June).
- A 5kg planting in optimal conditions will yield 100-145kg of garlic. Conventional garlic yields in B.C. range from 5-10 tonnes/hectare.
- In-row spacing of 5-6" with 8-10" between rows yields the largest bulbs; closer spacing enables more plants/hectare but reduces bulb size.

Crop Nutrient Needs

Garlic is considered a heavy feeder, and requires high soil fertility for strong yields.

Annual nutrient demands:

Nitrogen	128 lb/acre
Phosphorus	20 lb/acre
Potassium	95 lb/acre

Recommended micro-nutrient additions include magnesium and calcium.

Cover crops (brassicas, legumes, grain) can be planted shortly after harvest to improve soil fertility. For certified organic production, the use of manures, compost or alfalfa meal are options to increase soil fertility.



Equipment & Infrastructure

Hardneck is typically manually planted and harvested. For larger areas, the use of a dimpler for seeding is recommended (hand-push type or attached to tractor and used concurrently with last till before planting).

When bulbs are ready for harvest a tractor-mounted cutter bar can be used for larger areas; however, great care must be as fresh garlic bulbs bruise easily.

After careful removal of soil from the roots, the garlic plant is cured in bunches of 4-15 plants in drying sheds, out of direct light at 27°C for two weeks, or longer at lower temperatures.



Market & Economic Information

Key finding from market analysis:

Garlic represents a significant and growing opportunity in niche varieties, but not in generic / bulk options.

Market trends: There is steady demand for low-end varieties, growing demand for high-end, specialty types. This latter trend can be seen in rising demand for packaged garlic containers and garlic-infused products. Rising demand is supported by surging imports of garlic. Between 2012 and 2017, imports of garlic into British Columbia rose from \$10.9 million to \$28.3 million, while imports into Canada rose from \$33.2 million to \$62.9 million.

Set-up costs: \$50,000 - \$100,000 for a cellar to store the crop in dark, cool conditions.

Pricing: Garlic pricing can vary widely. Bulk, generic garlic is well below prices more niche offerings. Wholesale pricing for generic Garlic in Vancouver is currently \$1.35/kg - \$3.00/kg, and is sourced predominantly from China. Mid-market products are typically \$8.50/kg (\$3.85/lb) at wholesale, while specialty offerings can command \$30-\$35/kg.

Based on the sensitivity analysis with varying \$/kg and kg/ha, garlic ranged from a net cash of **\$18,944 to \$146,944**. The following is a 5-year cash-flow chart, assuming midrange prices (\$17/kg) and mid-level yield (6,000 kg/ha), the expected annual net cash is \$72,944.

	Year 1 (Start-Up)	Year 2	Year 3	Year 4	Year 5	Years 1-5
Revenue	\$0	\$102,000	\$102,000	\$102,000	\$102,000	
Expenses	\$50,000	\$29,056	\$29,056	\$29,056	\$29,056	
Net Cash	-\$50,000	\$72,944	\$72,944	\$72,944	\$72,944	\$241,775

For more information:

UNBC Cash and Bioenergy Crop Feasibility Study for BNRD:

<https://www.unbc.ca/research/supplementary-data-unbc-publications>

UNBC Market Research and Economic Feasibility on Specialty and Alternative Crops in the BNRD.

BC Provincial Government: Growing Garlic

<http://productionguide.agrifoodbc.ca/guides/17/>

The Complete Book of Garlic: A Guide for Gardeners, Growers and Serious Cooks. (2008)

Author: Ted Jordan Meredith

Garlic Production (Ontario)

<http://www.omafra.gov.on.ca/english/crops/facts/09-011w.htm>

USASK Garlic Information

<http://www.usask.ca/agriculture/plantsci/vegetable/vegetable/vgarlic.htm>

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