Jerusalem Artichoke: Production Information

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

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Crop Varieties

Jerusalem artichoke breeding has generated several varieties, primarily selected for smoother skinned uniform tubers because the gnarled, knobby, highly variable tuber shapes affect its appeal as a root crop.

Stampede is an early-maturing variety and produce round tubers. Red Fuseau is a red-skinned tuber.

White-skinned tuber varieties include:

- French White Mammoth
- Clearwater
- White Fuseau

Fingerling-type varieties include:

- Red Rover
- Walspinel

Crop Overview

Jerusalem artichoke (*Helianthus tuberosus*) is a vigorous herbaceous perennial in the Asteraceae family. Originating in the prairies and plains of North America, Jerusalem artichoke is naturalized across Canada, and is cultivated as an annual in Northern Europe and Asia.

Related to other sunflower species grown as ornamentals or for their oil, Jerusalem artichoke is primarily grown for its edible tubers. Variously known as Sunroot, Sunchoke, Earth Apple, and Topinambur, the crop grows to 1-3m (~3-10ft) in height with broad thick leaves, robust stems and yellow flowers.

The knobby tubers, 7.5-10cm (~3-4”) long and 3-5cm thick (~1-2”), grow from rhizomes. Each Jerusalem artichoke plant produces 1-2.5kg (~2-3lb) fresh weight of tubers. However, yield is highly dependent on variety and growth conditions, and can range from 10-80 tonnes/hectare.

Jerusalem artichoke is a vigorous dense crop, and often out-competes weeds after initial establishment. The crop should be grown no more than once every three years in a field.

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

- Jerusalem artichoke is known for its tolerance of marginal soils and can be grown in hard-clay soils, though the greatest yields and best tuber quality are grown in well-drained, moist, fertile, sandy loam soils that have a slightly alkaline pH.
- Natural vegetative propagation from Jerusalem artichoke tubers is so prolific that once a field is planted there is sufficient planting stock available for the following year.
- Frost and drought-tolerant, Jerusalem Artichoke requires as little as 40cm (~16") precipitation.
- Jerusalem artichoke seed is expensive with limited availability as most varieties are sterile. As such, Jerusalem artichoke is more commonly established vegetatively through the tubers. Whole tubers or tuber pieces with two to three buds are used for planting.
- Soil preparation for Jerusalem artichoke is similar to potato needs (i.e., plowing just before planting to produce loose texture and good drainage).

Crop Nutrient Needs

Though not necessary for all varieties, the crop's annual nutrient demands are:

Nitrogen	45-120 lb/acre
Potassium	45-150 lb/acre

Depending upon soil pH, addition of lime to increase alkalinity may also be beneficial. Spraying plants with inorganic selenium can enhance the nutritional value of tubers.

Equipment & Infrastructure

Planting and harvesting is done manually for small areas, though can be carried out with care using modified potato equipment.

During harvest, the woody shoots must be removed and equipment must be adjusted to accommodate the smaller, less uniform tuber size. Manual tuber separation, sorting, and washing to remove soil and stones is required to avoid bruising.

Because spoilage during storage is a significant problem, prompt tuber processing (i.e., washing, boiling, dehydrating, and/or freezing) is recommended.

Ideal storage conditions for Jerusalem artichoke tubers are 0-2°C and 90-95% humidity. Under these conditions, Jerusalem artichoke tubers can be stored for up to 12 months.

Market & Economic Information

Key finding from market analysis:
Jerusalem artichoke represents a niche opportunity.

Market trends: There is steady demand for the overall category, growing demand for high-end, niche offerings. Rising demand is supported by growing imports of Jerusalem artichoke and the related inulin category. Imports of Inulin to BC have risen swiftly over the last 5 years, and currently are in the $1.0 million range annually (up from $180,000 in 2012).

Food retailers and wholesalers cite fluctuations in reliable supply from global chains, and a steady price increase through the mid-decade. Although wholesale pricing is stable between 2017 and 2018, there is interest in locally sourcing this crop. Again, the standard caveats apply – reliable quality, quantity and pricing.

Pricing: Wholesale pricing has shown an upward trend, with in-season pricing rising from $19/carton in 2014 to $32/carton in 2018 for unclassified artichoke. Producer pricing of $3.50/kg - $5.00/kg is supported by wholesale data from Vancouver.

Based on the sensitivity analysis with varying $/kg and kg/ha, artichokes ranged from a net cash of **$2,756-$22,256**. The following is a 5-year cash-flow chart, assuming midrange prices ($4.25/kg) and mid-level yields (4,500 kg/ha), the expected annual net cash is $11,381.

	Year 1 Start-Up	Year 2	Year 3	Year 4	Year 5	Years 1-5
Revenue	$19,125	$19,125	$19,125	$19,125	$19,125	
Expenses	$7,744	$7,744	$7,744	$7,744	$7,744	
Net Cash	$11,382	$11,382	$11,382	$11,382	$11,382	**$56,908**

For more information:

UNBC Cash Crop & Bioenergy Crop Feasibility Study for the BNRD:
https://www.unbc.ca/research/supplementary-data-unbc-publications

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

Alternative Field Crops Manual - Jerusalem Artichoke
www.hort.purdue.edu/newcrop/afcm/jerusart.html

Jerusalem Artichoke Factsheet
www.omafra.gov.on.ca/english/crops/facts/94-077.htm

Oregon Vegetables, Artichoke, Jerusalem
http://horticulture.oregonstate.edu/content/artichoke-jerusalem

Growing Jerusalem Artichokes (Sunchokes)
https://www.growveg.com/guides/growing-jerusalem-artichokes-sunchokes

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