

A close-up photograph of several ripe, orange-colored citrus fruits hanging from a tree with green leaves. The background is a blurred view of more trees and foliage, suggesting a large orchard.

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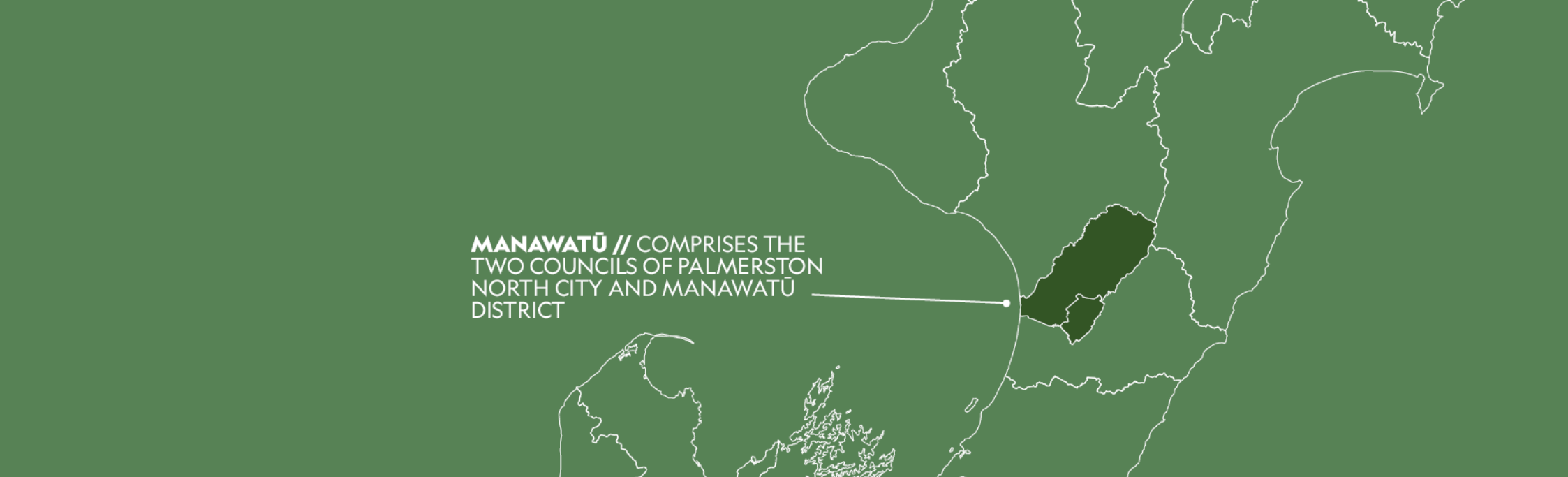
MANAWATŪ

CITRUS

IN MANAWATŪ

A GROWER GUIDE

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MANAWATŪ // COMPRISES THE
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DISTRICT

CITRUS // VERSATILE, HIGH-VALUE FRUIT WITH STRONG YEAR-ROUND MARKET DEMAND

Citrus fruits, particularly mandarins, lemons, and oranges, are popular with consumers and can deliver strong returns when well managed. While traditionally grown in warmer regions like Gisborne and Northland, certain citrus types can perform well in sheltered areas of Manawatū with good site selection and frost protection.

This guide is designed to help landowners and prospective growers explore the potential for citrus production in the region. Developed by the Central Economic Development Agency, this guide was created as part of the [Manawatū Regional Food Strategy](#).

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SUITABLE CITRUS VARIETIES + CHARACTERISTICS

Manawatū's climate presents both opportunities and limitations for citrus growing. While some varieties thrive in cooler conditions, others require careful site selection or protection to succeed commercially.

Climate considerations for the region are further outlined in the Diversification of Farm Systems report.

Choosing the right citrus variety is essential, as each has unique characteristics that influence harvest timing, market suitability, and resilience to frost.

CHARACTERISTICS OF CITRUS

- > **Cold tolerance:** Some citrus varieties are better suited to cooler climates and can withstand light frosts.
- > **Harvest timing:** Citrus varieties differ in their harvest windows, which can affect market entry and labour planning.
- > **Seedlessness:** Seedless varieties are often preferred for fresh consumption and retail markets.
- > **Eating quality:** Flavour profile and sweetness levels vary across varieties and influence consumer preference.
- > **Cropping cycle:** Some varieties offer extended or repeat cropping seasons, improving yield potential.

While certain varieties may possess multiple favourable traits, their performance can be impacted by frost exposure, soil conditions, and shelter availability.



Citrus varieties likely to suit the Manawatū region:

MANDARINS:

Early to Late season – Cold Tolerant to Moderate

> **Satsuma** (e.g., Miho, Silverhill):

Satsuma mandarins are seedless, cold-tolerant, and ideal for cooler areas like Manawatū. They are early harvest varieties (May–June) and are favoured for their ease of peeling and mild flavour. These are considered the most reliable mandarin types for the region.

> **Encore, Afourer:**

These later-maturing mandarins offer a sweeter flavour but are less cold hardy. They require more sheltered growing conditions and are better suited to protected microclimates or covered systems.

LEMONS:

Year-Round to Summer Cropping – Hardy to Moderate

> **Meyer:**

Meyer lemons are hardy and well-suited to Manawatū's conditions. Known for their year-round cropping potential, they offer consistent yields and a sweeter flavour profile than traditional lemons.

> **Yen Ben:**

Yen Ben is a commercial variety with a strong rind and summer harvest window. While less hardy than Meyer, it performs well in sheltered sites and is valued for its juicing quality and market appeal.



ORANGES:

Mid to Late Season – Frost Sensitive

> Washington Navel:

This mid-season orange is prized for its excellent eating quality. However, it is frost-sensitive and requires careful site selection or frost protection to succeed in Manawatū.

> Valencia:

Valencia oranges are a late-season variety primarily used for juicing. Like other oranges, they are sensitive to frost and should be grown in well-sheltered areas or under cover.

LIMES:

Year-Round Potential – Highly Frost Sensitive

> Limes (General):

Limes are generally too frost-sensitive for most of Manawatū. They should only be grown in very sheltered spots or under protective cover such as greenhouses or tunnel houses. Their commercial viability is limited unless frost protection is guaranteed.





SELECTING A SITE

Selecting the right site is critical for successful citrus production in the Manawatū region. While citrus can be grown commercially in this area, careful consideration must be given to climate, soil, and water access to ensure long-term viability and fruit quality.

Climate Considerations:

Citrus trees are sensitive to frost, and as such, a frost-free or low-frost site is essential. Ideally, the site should experience fewer than five frosts per year. Even cold-tolerant varieties such as Satsuma mandarins and Meyer lemons can only withstand brief dips to -2°C, and only if these events are infrequent and short-lived.

To improve fruit set and overall tree health, it is recommended to shelter citrus from cold winds and heavy rainfall. This can be achieved through the use of shelterbelts, windbreaks, or strategic planting near natural barriers. Exposure to cold winds can reduce pollination success and increase fruit drop, while excessive rain during flowering can damage blooms and reduce yield.



Soil Preferences:

Citrus thrives in free-draining sandy loam or loam soils. These soil types allow for adequate root aeration and reduce the risk of root rot, which citrus is particularly susceptible to. Avoid planting in poorly drained or heavy clay soils, as these can lead to waterlogging and disease pressure.

The optimal soil pH is between 5.5–6.5. If soil tests indicate acidity below this range, lime should be applied to raise the pH to suitable levels. Soil testing is strongly recommended prior to planting, and resources such as [Ballance's soil testing guide](#) can assist in this process.

Water Access:

Reliable access to water is essential for citrus, particularly during dry periods, fruit set, and summer growth. Citrus trees have shallow root systems and are highly sensitive to water stress, which can lead to reduced fruit size, poor skin quality, and premature fruit drop.

Regular irrigation should be planned as part of the orchard management system. Drip irrigation is often preferred for its efficiency and ability to deliver water directly to the root zone while minimising disease risk from wet foliage.





PLANTING INSTRUCTIONS

Citrus planting in the Manawatū region requires careful timing and preparation to ensure successful establishment and long-term productivity. While citrus can be grown commercially in this area, frost risk and soil conditions must be managed proactively.

Planting Time:

Citrus should be planted in spring (September–November) once the risk of frost has passed. Early planting allows trees to establish roots before the onset of summer heat and supports strong vegetative growth. Cold-sensitive varieties should never be planted during frost-prone periods, as young trees are particularly vulnerable to damage.

Spacing:

Spacing is a critical factor in orchard design. For standard orchards, trees should be spaced 3–4 metres apart, with 5–6 metres between rows. This allows for adequate sunlight penetration, air circulation, and machinery access. In high-density orchards, trees may be planted closer together, but this

requires regular pruning to manage canopy size and maintain fruit quality.

Planting Steps:

1. Begin by cultivating and loosening the soil to a depth of 30–50 cm. This improves root penetration and enhances water and nutrient uptake. Avoid compacted or clumpy soil and ensure the planting area is well-drained.
2. When planting, dig a hole twice as wide as the root ball to allow roots to spread easily.
3. Position the tree so that the graft union sits above the soil line, this prevents rot and ensures the scion remains dominant.
4. After planting, water in thoroughly to settle the soil around the roots and eliminate air pockets.
5. Apply mulch in a 20–30 cm diameter ring around the base of the tree to retain moisture, suppress weeds, and regulate soil temperature. Avoid piling mulch directly against the trunk.

For the first 1–3 years, young citrus trees may require wind protection or frost cloth, especially in exposed or marginal sites. This helps reduce transplant shock and protects tender growth during cold snaps.





FERTILISING + CARE

Ongoing care is essential for maintaining healthy citrus trees and ensuring consistent fruit production in the Manawatū region.

While citrus can thrive here with the right variety and site selection, attention to fertilisation, irrigation, mulching, and pruning will support long-term orchard success.

Fertilisation:

Citrus trees require a balanced nutrient programme to support vegetative growth, flowering, and fruit development. For mature trees, apply 100–250 grams of nitrogen per tree per year, split across 2–3 applications to avoid leaching and promote steady uptake.

Phosphorus and potassium requirements should be determined by soil testing, as levels can vary significantly across sites. These nutrients are critical for root development and fruit quality.

Magnesium and trace elements such as iron (Fe), zinc (Zn), and manganese (Mn) are often needed to maintain leaf health and prevent deficiencies. Regular foliar assessments and targeted supplementation are recommended.

Mulching:

Maintain a 10–15 cm layer of mulch around the base of each tree throughout the year. Mulch helps to retain soil moisture, suppress weed growth, and regulate soil temperature. Avoid direct contact with the trunk to prevent rot and pest issues. Organic mulch such as wood chips or composted bark is preferred for its slow breakdown and nutrient contribution.



Irrigation:

Citrus trees are highly sensitive to water stress, particularly during flowering (spring) and fruit development (summer). Drip irrigation is recommended for its efficiency and ability to deliver water directly to the root zone.

Avoid over-watering during winter, as citrus roots are less active and excess moisture can lead to fungal issues. Monitor soil moisture levels regularly and adjust irrigation schedules based on seasonal rainfall and tree demand.

Pruning:

Pruning should be approached with care. In the early years, light shaping helps to establish a strong framework and open canopy. Annually, remove dead wood and crossed branches to improve airflow and reduce disease risk.

Avoid heavy pruning, as this can reduce fruiting and delay production. Instead, focus on maintaining structure and removing only what is necessary to support tree health and productivity.



WEED, PEST + DISEASE MANAGEMENT

Effective management of weeds, pests, and diseases is essential for maintaining healthy citrus trees and ensuring consistent yields in the Manawatū region.

A proactive and integrated approach will help reduce stress on trees and improve fruit quality.

Weed Management:

Keeping the root zone clear of competition is critical for young and mature citrus trees alike. Weeds can compete for water and nutrients and also harbour pests and diseases.

- > Apply a mulch layer or use weed mat to suppress weed growth around the base of the tree.
- > Where appropriate, herbicides may be used with care to avoid trunk contact.
- > Inter-row grass should be mown regularly to reduce competition and maintain orchard hygiene.



Key Pests:

Several insect pests can affect citrus in the region. Regular monitoring and early intervention are key to effective control.

- > **Citrus whitefly:** A sap-sucking insect that can weaken trees and promote sooty mould. Control with neem oil or insecticidal soap.
- > **Scale insects** (e.g., red scale, soft brown scale): These pests can be managed using horticultural oil or biological controls such as parasitic wasps.
- > **Aphids and mealybugs:** Common in spring and early summer. Monitor populations and treat early to prevent spread.
- > **Citrus borer:** This pest tunnels into wood, causing dieback. Prune out infected branches and dispose of them away from the orchard.

Disease Management:

Citrus trees are susceptible to several fungal and bacterial diseases, particularly in humid or poorly drained conditions.

- > **Citrus verrucosis** (scab): Common on lemons, this disease causes raised, corky lesions on fruit and stems. Apply copper sprays in spring to protect new growth.
- > **Root rots** (*Phytophthora*): These are often caused by poor drainage or excessive trunk wetting. Ensure good soil drainage and avoid watering directly at the base of the trunk.
- > **Sooty mould:** A black fungal growth that develops on honeydew excreted by sap-sucking insects. Managing insect populations is the most effective way to prevent this secondary issue.

Regular monitoring, preventative practices, and timely interventions are essential to maintaining healthy, productive trees.



COMPLIANCE



Citrus grown for retail and export markets must meet strict compliance standards to ensure food safety, traceability, and market access.

These requirements are essential for maintaining consumer confidence and meeting regulatory obligations in New Zealand and abroad.

Certification and Documentation:

Most commercial retail suppliers require NZGAP certification, which verifies good agricultural practices and traceability throughout the production cycle. Growers must maintain accurate spray diaries and strictly adhere to withholding periods for all chemical applications to ensure residue levels remain within legal limits.

Harvest timing must align with fruit maturity standards, including Brix levels and skin colour, to meet market expectations and avoid premature picking. For export, additional protocols such as residue testing and hygiene procedures are mandatory and should be integrated into the orchard's operational plan.

Biosecurity Awareness:

New Zealand maintains a high biosecurity standard, and citrus growers play a key role in protecting the industry. Be vigilant for notifiable pests, such as citrus greening (Huanglongbing), which is not currently present in New Zealand but is actively monitored.

Any unusual symptoms in trees—such as leaf yellowing, dieback, or fruit deformities—should be reported immediately to MPI or a local horticultural advisor. Early detection and reporting are critical to preventing the spread of serious pests and diseases.



HARVESTING + STORAGE

Harvest timing and post-harvest handling are critical to maintaining fruit quality and meeting market expectations.

Citrus must be harvested at full maturity, as it does not continue to ripen once picked. Proper technique and storage conditions will help preserve fruit condition and reduce losses.

Harvest Season (Manawatū):

Harvest windows vary by variety and should be planned to align with peak maturity and market demand:

- > **Mandarins:** May–July
- > **Lemons:** Year-round cropping, with a peak in winter
- > **Oranges:** June–September, depending on the variety

Monitoring Brix levels and skin colour is essential to determine optimal harvest timing, particularly for retail and export markets.

Harvesting Method:

Citrus should be hand-picked into soft bags or bins to minimise bruising and skin damage. Use clippers or secateurs to harvest fruit with the stalks intact, which helps extend shelf life and reduces the risk of fungal infection.

Avoid rough handling or overfilling containers, as this can lead to pressure damage and reduce marketable yield.

Post-Harvest Handling:

Citrus does not ripen after harvest, so fruit must be picked only when fully mature. Immature fruit will not develop further sweetness or colour once removed from the tree.

For short-term storage, maintain temperatures between 5–10°C. This helps preserve freshness while avoiding chilling injury, which can occur if fruit is stored too cold, particularly in sensitive varieties.

For higher-end retail markets, waxing and grading may be required to enhance appearance and ensure uniformity. Grading should be based on size, colour, and skin condition, and aligned with market specifications.





FINANCIAL INFORMATION

Citrus can be a profitable and rewarding crop when grown in well-selected sites across the Manawatū region.

With careful variety selection, frost protection, and consistent orchard management, growers can achieve strong returns over the long term.

Yields (Mature Orchard):

Expected yields will vary depending on variety, site conditions, and management practices.

Indicative yields for mature orchards are:

- > **Mandarins:** 15–30 tonnes per hectare
- > **Lemons:** 20–40 tonnes per hectare
- > **Oranges:** 25–35 tonnes per hectare

These figures reflect commercial-scale production under optimal conditions and may vary with seasonal factors and pest pressure.

Market prices (2024–25):

Citrus prices fluctuate based on supply, demand, and quality.

Indicative fresh market prices are:

- > **Mandarins:** \$1.80–\$3.50/kg
- > **Lemons:** \$1.50–\$3.00/kg
- > **Oranges:** \$1.20–\$2.50/kg

Fruit graded for processing typically returns \$0.10–\$0.40/kg, depending on end use and contract terms.



Establishment Costs:

Initial establishment costs range from \$25,000–\$40,000 per hectare, depending on:

- > Shelterbelt installation
- > Irrigation infrastructure
- > Frost protection measures
- > Planting stock and variety selection

These costs cover site preparation, planting, and early orchard development. Citrus typically reaches full cropping by Year 5–6, with a productive lifespan of 20+ years when properly maintained.

Citrus varieties such as Satsuma mandarins and Meyer lemons are particularly well-suited to Manawatū's climate. Success depends on frost protection, pest and disease management, and regular orchard maintenance. With the right approach, citrus offers strong potential for diversification and long-term profitability.



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