



CEDA
CENTRAL ECONOMIC
DEVELOPMENT AGENCY

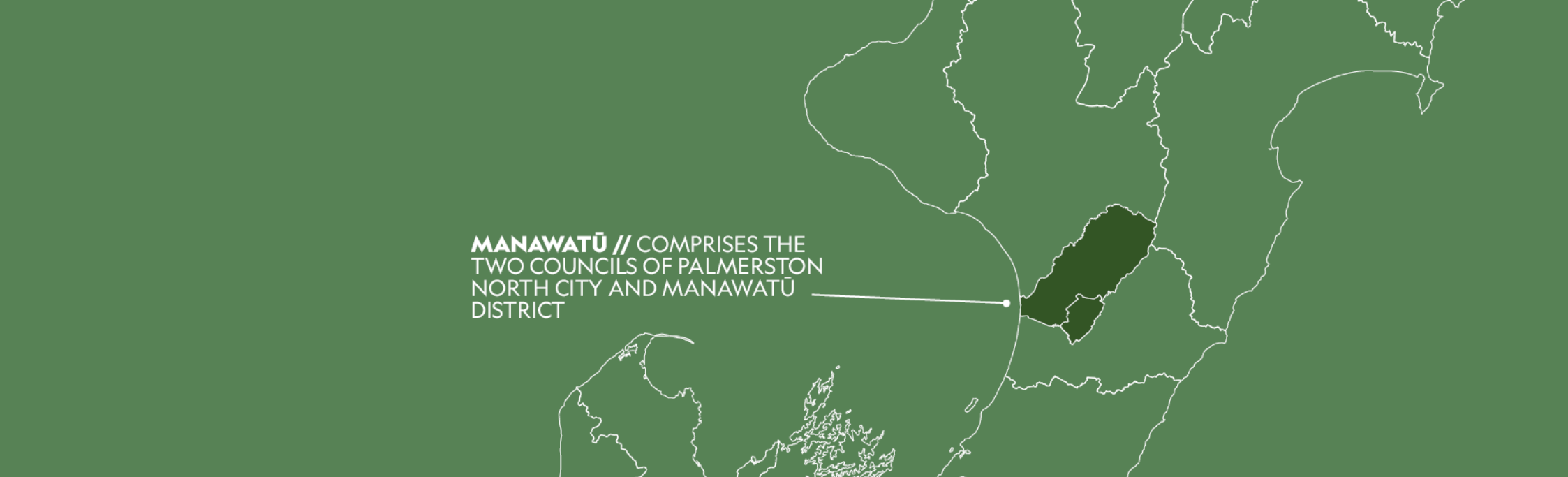
MANAWATŪ

APPLES

IN MANAWATŪ

A GROWER GUIDE

PUBLISHED: SEPTEMBER 2025



MANAWATŪ // COMPRISES THE
TWO COUNCILS OF PALMERSTON
NORTH CITY AND MANAWATŪ
DISTRICT

APPLES // A RESILIENT PERENNIAL CROP WITH STRONG DOMESTIC AND EXPORT MARKETS

Apples are a proven performer in New Zealand's horticultural landscape, with well-established markets and robust returns. In the Manawatū region, they present an opportunity for diversification, especially for growers with suitable microclimates and access to irrigation.

This guide is designed to support landowners and growers exploring the commercial potential of apple production in Manawatū. Developed by the Central Economic Development Agency, this guide was created as part of the [Manawatū Regional Food Strategy](#).

CONTENTS

- > Suitable varieties and characteristics
- > Selecting a site
- > Planting instructions
- > Fertilising and care
- > Weed, pest, and disease management
- > Compliance
- > Harvesting and storage
- > Financial information



SUITABLE APPLE VARIETIES + CHARACTERISTICS

Manawatū's climate supports a range of apple cultivars, each with distinct harvest timings, flavour profiles, and storage capabilities.

Climate considerations for the region are further outlined in the [Diversification of Farm Systems report](#).

Selecting the right combination of rootstock and scion is essential for commercial success, and should be guided by soil type, wind exposure, and desired tree size.

CHARACTERISTICS OF APPLES

- > **Early to late harvest windows:** Cultivars range from early-season to late-season, allowing for staggered harvests and market timing.
- > **Flavour profiles:** Apples vary from sweet to tangy-sweet, with some varieties favoured for fresh eating and others for export.
- > **Storage life:** Some cultivars store exceptionally well, extending market availability.
- > **Export potential:** Premium varieties offer strong returns in international markets.
- > **Pollination needs:** Apples require cross-pollination, plan for at least two compatible pollinators per main variety.

While some varieties may exhibit multiple of these traits, growers should also consider factors such as storage, and market demands when selecting cultivars.



Apple varieties likely to suit the Manawatū region include:

ROYAL GALA:

Early Season – Sweet Flavour – Fresh Market

Royal Gala is an early-season apple known for its high colour and sweet taste. It is favoured for fresh consumption and performs well in local markets. While not the longest storing apple, its early harvest window allows growers to enter the market ahead of mid- and late-season competitors.

BRAEBURN:

Mid Season – Tangy-Sweet – Excellent Storage

Braeburn is a mid-season cultivar with a balanced tangy-sweet flavour. It is highly regarded for its excellent storage life, making it a reliable choice for both domestic and export markets. Braeburn trees are moderately vigorous and benefit from careful rootstock selection to manage size and yield.

FUJI:

Late Season – Very Sweet – Firm Texture

Fuji is a late-season apple with a firm texture and very sweet flavour. It is popular among consumers and stores well, making it suitable for extended market availability. Fuji trees require good pollination planning and thrive in well-drained soils.



NZ QUEEN/NZ ROSE:

Late Season – Premium Export – High Return Potential

NZ Queen and NZ Rose are premium export cultivars with strong market demand and high return potential. These apples are typically grown for international markets and require careful management to meet export standards. Their flavour and appearance make them standout choices for growers targeting premium segments.

Recommended Rootstocks:

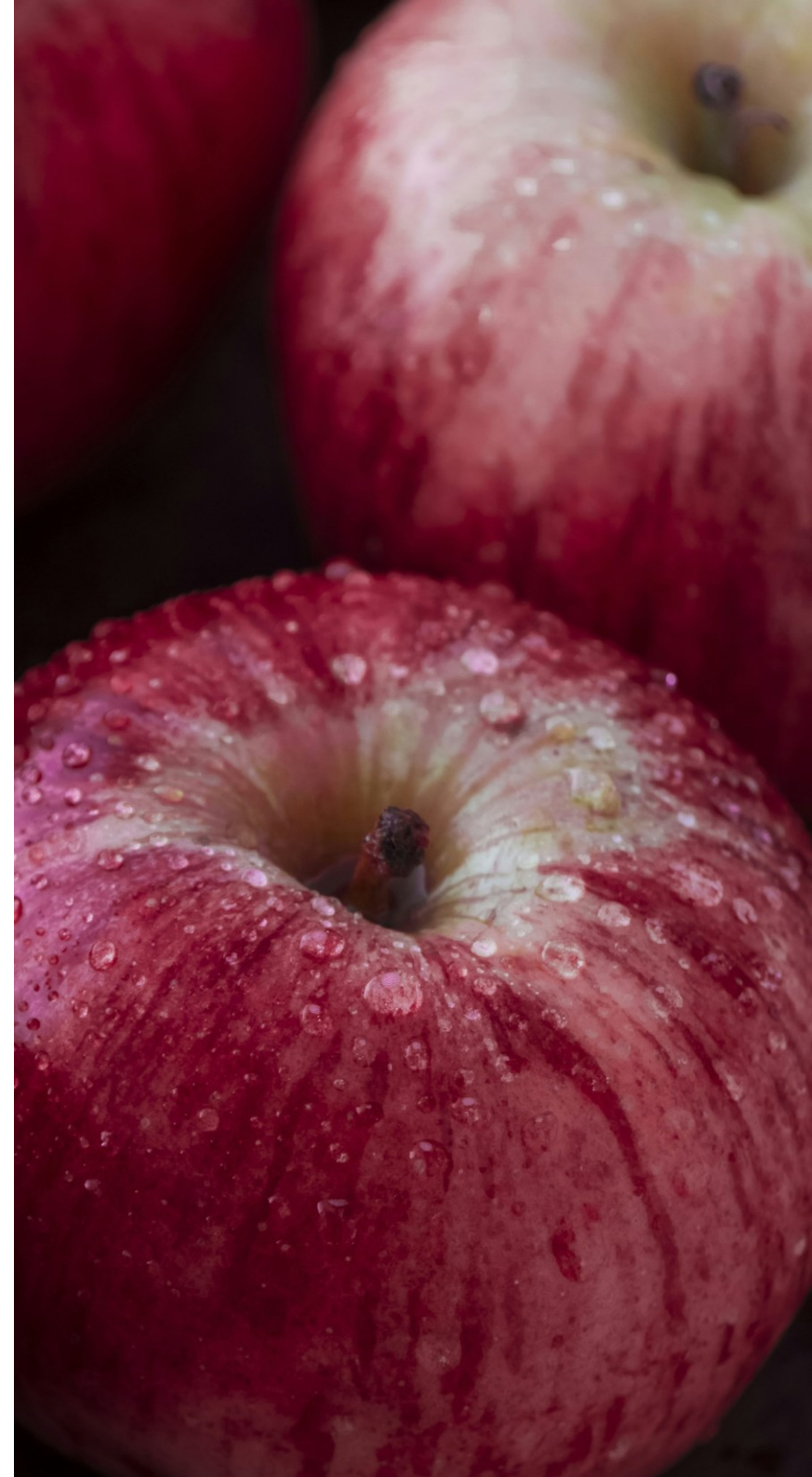
M9, M26:

Dwarfing rootstocks suitable for high-density plantings with support structures. Ideal for intensive orchard systems.

MM106:

Semi-dwarf rootstock offering resilience in variable soil conditions. Suitable for growers seeking a balance between tree size and adaptability.

Rootstock selection should be based on site-specific factors including soil type, wind exposure, and orchard layout. Successful apple production in Manawatū depends on matching cultivar and rootstock to local conditions and market goals.





SELECTING A SITE

Before establishing an apple orchard, it is important to understand the environmental and soil conditions that will support healthy tree development, consistent yields, and high-quality fruit.

Climate Considerations:

Apples require a period of winter dormancy to ensure proper bud development and fruiting. This is achieved through chilling hours, ideally more than 800 hours of temperatures between 0°C and 7°C. Without sufficient chilling, trees may experience delayed or uneven bud break, reducing yield and fruit quality.

Spring frosts pose a significant risk to apple blossoms. Selecting a site with good air drainage, such as gentle slopes or elevated areas, can help reduce frost damage by allowing cold air to flow away from the orchard. Additionally, shelter from strong prevailing winds is recommended to prevent damage to trees and fruit, and to support effective pollination.

Soil Preferences:

Apples thrive in well-drained soils with good fertility. Loam or silt loam soils are ideal, offering a balance of moisture retention and drainage. The optimal soil pH for apple trees is between 6.0 and 6.5. Heavy clay soils should be avoided unless drainage improvements such as raised beds or subsurface drainage systems are implemented. Soil testing is strongly recommended prior to planting. Resources such as Ballances Soil Testing Guide can help growers assess pH, nutrient levels, and organic matter content to ensure the site is suitable for long-term orchard health.

Water Access:

Reliable access to water is essential for apple production. Irrigation is particularly important during flowering, fruit development, and periods of summer drought. Inconsistent water supply can lead to poor fruit set, reduced size, and quality issues such as bitter pit or sunburn. Planning for irrigation infrastructure, including water storage and delivery systems, should be part of the initial site assessment. Apples are a perennial crop with trees remaining productive for decades. As such, selecting a site with optimal climate, soil, and water access is a foundational step toward a successful and sustainable orchard venture.



PLANTING INSTRUCTIONS

Establishing an apple orchard requires careful planning and preparation to ensure long-term tree health, optimal fruit production, and ease of management. While apples are a perennial crop, the initial planting phase sets the foundation for decades of productivity.

Timing and dormancy:

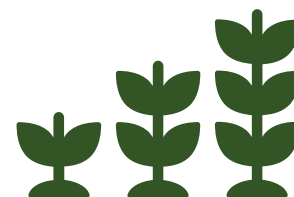
Apple trees should be planted during winter (June–August) while they are dormant. This timing allows the trees to settle into the soil before spring growth begins, reducing transplant shock and supporting strong root establishment.

Soil preparation:

Ideally, soil preparation should begin well in advance of planting. Deep ripping and cultivation are recommended to break up compacted layers and improve root penetration. Adding compost or organic matter can enhance soil structure and fertility, especially in sites with low organic content. The soil should be friable and well-drained, with a pH between 6.0 and 6.5. Before planting, prune any damaged or excessively long roots and ensure the tree is planted with the graft union just above the soil line. This helps prevent scion rooting and supports proper tree development.

Spacing and layout:

In high-density orchard systems, spacing is critical for light interception, air circulation, and ease of management.



Recommended spacing is:

- > **Tree spacing:** 0.8–1.2 metres apart within rows
- > **Row spacing:** 3.0–4.0 metres between rows

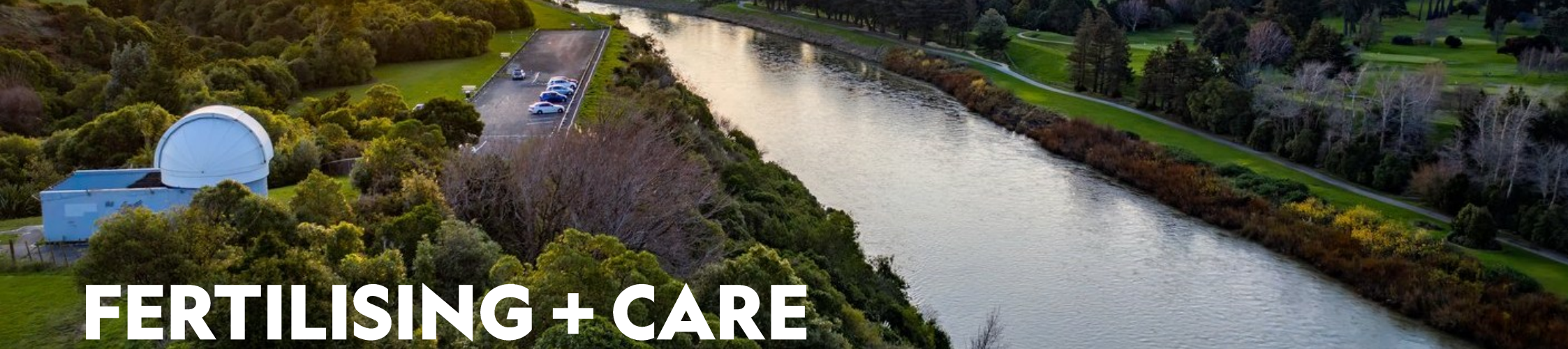
This layout supports efficient orchard operations and maximises yield per hectare. Trees should be planted with a permanent trellis or post-and-wire system, especially when using dwarfing rootstocks such as M9 or M26. These support structures are essential for maintaining tree form and preventing wind damage.

The planting process:

- > Ensure soil is moist but not waterlogged.
- > Dig planting holes to accommodate the root system without bending or crowding.
- > Position the tree with the graft union above the soil surface.
- > Backfill with soil, firming gently to eliminate air pockets.
- > Water thoroughly after planting to settle the soil around the roots.
- > Apply mulch or weed matting to suppress weeds and retain moisture.
- > Install support structures immediately if using dwarf rootstocks.

Apple trees may take several seasons to reach full production, but careful attention to planting detail will support healthy growth and consistent yields over time.





FERTILISING + CARE

Apple trees require a tailored approach to fertilising and care, particularly in the first few years of establishment. The focus during this period should be on building strong root systems and tree structure, rather than encouraging heavy fruiting.

Years 1-3:

In the early years, minimal fruiting is encouraged to allow the tree to direct energy into vegetative growth and root development. Pruning and training should be prioritised to establish a balanced canopy and scaffold structure that will support future yields.

Nutrient requirements:

Apples have specific nutrient needs that change as the trees mature. Fertiliser application should be guided by soil testing, with adjustments made based on tree age, growth stage, and observed deficiencies.



As a general guide, each plant requires:

- > **Nitrogen:** Apply 30–80 kg N/ha annually, increasing gradually as trees mature. Nitrogen supports leaf and shoot growth, which is essential for canopy development and fruiting potential.
- > **Phosphorus and Potassium:** Apply based on soil test results. Potassium is particularly important during fruit development, as apples remove moderate amounts of K from the soil.
- > **Calcium:** Should be monitored closely, especially in soils with higher pH, as deficiencies can impact plant health and fruit quality.
- > **Lime and Boron:** Commonly applied pre-planting to correct pH and support cell wall development. Boron is especially important for flower formation and fruit set.

Irrigation:

Consistent moisture is vital for apple production. Drip irrigation is preferred as it delivers water directly to the root zone, reducing evaporation and disease risk. Avoid moisture stress during key growth phases – flowering, cell division, and ripening – as this can impact fruit size, quality, and overall yield. Regular monitoring of soil moisture, nutrient levels, and tree health will help guide fertiliser and irrigation decisions. A well-managed orchard will show steady vegetative growth, balanced fruiting, and resilience to environmental stress.





WEED, PEST + DISEASE MANAGEMENT

Apple trees, particularly in their early years, are vulnerable to competition from weeds and pressure from pests and diseases.

Effective management is essential to protect tree health, support fruit development, and maintain orchard productivity.

Weed control:

Weeds compete with apple trees for nutrients, water, and light, especially in the root zone. Maintaining a clean strip under trees is recommended, which can be achieved using mulch, weed matting, or targeted herbicide applications. Mulch can also help retain soil moisture and improve organic matter, but care should be taken to avoid excessive buildup around the trunk to prevent rot. Between rows, grass can be mown or grazed to manage growth and reduce weed seed spread. Regular monitoring and maintenance of these areas will help reduce overall weed pressure in the orchard.

Pest management:

Apples are susceptible to a range of insect pests, with some requiring proactive and ongoing control measures:

- > **Codling Moth:** Considered a key pest in apple production. Control methods include mating disruption, pheromone trapping, and targeted insecticide applications timed to the moth's lifecycle.
- > **Leafrollers and aphids:** These pests can cause damage to leaves and young fruit. Regular monitoring is essential, especially during periods of rapid growth.



- > **Woolley apple aphid:** Particularly problematic on susceptible rootstocks. Management may include biological controls, pruning of infested branches, and systemic treatments if necessary.

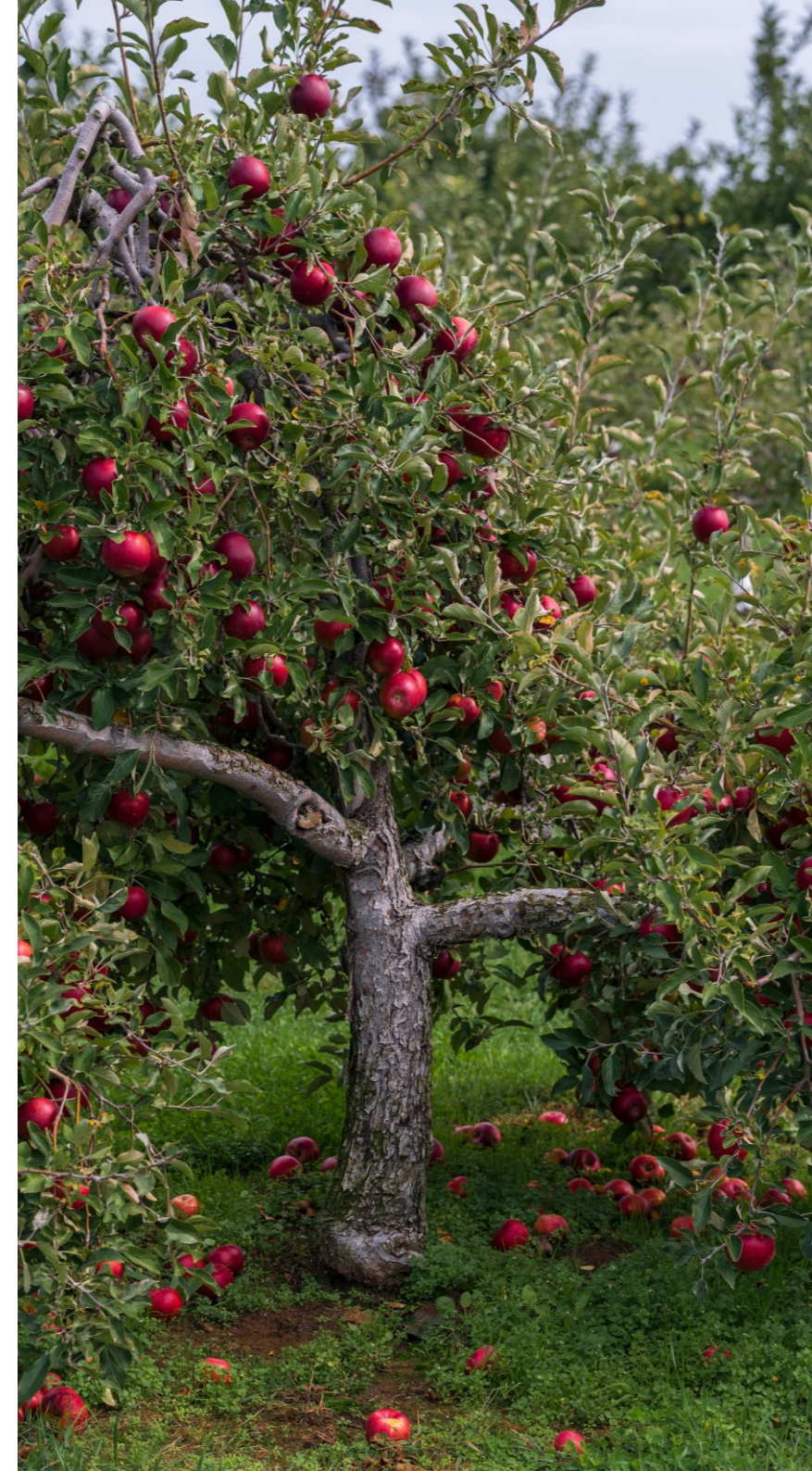
Disease management:

Several fungal and bacterial diseases can impact apple trees, with severity depending on climate and orchard conditions:

- > **Apple scab and powdery mildew:** These are common fungal diseases that require a regular fungicide programme, especially during wet and humid conditions.
- > **Fireblight:** While considered low risk in the Manawatū region, it should still be monitored during warm, wet springs when conditions favour its spread.
- > **Bitter pit and calcium-related disorders:** These physiological issues are linked to calcium deficiency and can be managed through foliar calcium sprays during fruit development.

Integrated Pest Management (IPM):

IPM is strongly encouraged for apple production. This approach combines biological, cultural, physical, and chemical tools to manage pests and diseases in a sustainable and environmentally responsible way. Regular scouting, record-keeping, and threshold-based interventions are key components of a successful IPM strategy.





COMPLIANCE

Apple growers operating in commercial or export-focused markets must meet a range of regulatory and quality assurance standards.

These requirements are in place to ensure food safety, traceability, and market access – both domestically and internationally.

Key compliance considerations include:

- > **Certification:** Most commercial buyers require growers to be certified under NZGAP or GLOBALG.A.P. These programmes verify that good agricultural practices are being followed, including environmental management, worker welfare, and food safety.
- > **Spray diary and withholding periods:** Accurate record-keeping of all chemical applications is essential. This includes maintaining a spray diary and adhering to withholding periods to ensure residue compliance.
- > **Water and food safety testing:** Water used for irrigation and post-harvest handling must meet food safety standards. Regular testing is required to verify that water sources are free from contaminants.
- > **Post-harvest hygiene and traceability:** Growers must implement clean handling practices and maintain traceability systems that can track fruit from the orchard to the final market. This is critical for both food safety and market assurance.
- > **On-orchard and Packhouse Food Safety Audits:** These assess compliance with handling, hygiene, and documentation standards.



Export requirements:

Exporting apples involves additional layers of compliance, including:

- > Phytosanitary inspections to confirm the absence of pests and diseases.
- > Residue testing to ensure agrichemical levels are within acceptable limits.
- > Cultivar registration for certain markets, which may require proof of variety identity and origin.

Some export destinations, such as the USA and China, have specific pest control protocols that must be followed. These may include mandatory treatments, monitoring programmes, or additional documentation. Meeting these compliance requirements is essential for maintaining market access and reputation. Growers are encouraged to stay up to date with evolving standards and work closely with industry bodies and export partners to ensure all obligations are met.





HARVESTING + STORAGE

Harvesting apples in the Manawatū region requires careful timing and handling to ensure fruit quality, minimise damage, and maximise storage life.

Seasonal variations, including temperature, rainfall, and sunlight hours, can influence ripening, so growers should monitor fruit maturity closely in the lead-up to harvest.

Harvest timing:

Apple varieties mature at different times throughout late summer and autumn although climate and orchard conditions may shift these windows slightly.

In the Manawatū region, the general harvest calendar is:

- > **Early Season varieties:** Late February to early March
- > **Mid Season varieties:** March to April
- > **Late Season varieties:** April to May

Growers should assess fruit maturity using starch tests, colour development, and taste. Harvesting too early can result in underdeveloped flavour and poor storage performance, while harvesting too late increases the risk of bruising and over-ripeness.



Harvesting method:

Apples are hand-picked into padded picking bags to minimise bruising. Gentle handling is essential throughout the harvest process, as even minor damage can reduce shelf life and marketability. Fruit should be kept out of direct sunlight during harvest to prevent sunburn and heat stress.

Post-harvest handling:

Once harvested, apples should be cooled as quickly as possible – ideally within 12 hours – to below 1°C. Rapid cooling slows respiration and preserves firmness, flavour, and nutritional quality.

For long-term storage, Controlled Atmosphere (CA) storage is recommended. This method regulates oxygen, carbon dioxide, and humidity levels to extend the market window for apples to between 6 and 10 months, depending on the variety.

Before distribution, apples are typically:

- > Graded and sized to meet market specifications.
- > Washed and optionally waxed to enhance appearance and reduce moisture loss.
- > Packed into cartons or bins with traceability labels for retail or export.

Growers should also monitor for post-harvest disorders such as bitter pit, which can be managed through pre-harvest calcium nutrition and careful storage practices.





FINANCIAL INFORMATION

Establishing an apple orchard in the Manawatū region is a long-term investment that requires careful financial planning.

While initial costs can be significant, well-managed orchards have the potential to deliver strong returns over time, particularly when targeting premium domestic and export markets.

Yields and production:

Apple trees typically reach full production between Year 6 and Year 7, depending on variety, rootstock, and orchard management.

Yield potential varies widely:

- > **Standard orchards:** 10–60 tonnes per hectare.
- > **High-density systems:** With optimal spacing, trellising, and irrigation, yields can exceed 80 tonnes per hectare.

Early years should focus on tree establishment and canopy development, with minimal fruiting encouraged to support long-term productivity.



Indicative market prices (2024-25):

Prices fluctuate based on variety, grade, and market destination.

The following ranges offer a general guide:

- > **Domestic fresh market:** \$1.50-\$3.00/kg
- > **Export premium varieties:** \$2.50-\$4.50/kg
- > **Processing grade:** \$0.20-\$0.40/kg

Export markets typically offer higher returns, especially for premium cultivars with strong colour, flavour, and shelf life. However, these channels also come with higher compliance and handling costs.

Establishment costs:

Estimated initial investment ranges from \$40,000 to \$80,000 per hectare, depending on:

- > Trellis and support systems
- > Irrigation systems and infrastructure
- > Tree Density and cultivar selection

These costs cover site preparation, planting, and early orchard development. Additional expenses may include compliance certification, pest management systems, and packhouse setup.

Orchard lifespan:

With proper care and ongoing management, apple orchards can remain productive for 20 years or more. Regular pruning, nutrition, and pest control are essential to maintain tree health and fruit quality throughout the orchard's life cycle.

Apples offer proven profitability for well-managed operations. Manawatū growers with suitable sites and an eye on quality can tap into strong domestic and international demand.



DISCLAIMER: This Grower Guide was compiled by CEDA using publicly available information sourced from the web. While every effort has been made to ensure the accuracy and relevance of the content as of August 2025, CEDA makes no representations or warranties, express or implied, regarding the completeness, reliability, or suitability of the information provided. Users are encouraged to conduct their own independent research and seek professional advice before making decisions based on this guide. CEDA accepts no liability for any errors, omissions, or consequences arising from the use of this material. Portions of this guide were generated with the assistance of artificial intelligence (AI).

➔ ManawatuNZ.co.nz/FoodStrategy