

# WHEAT, BARLEY AND OATS

## IN MANAWATŪ

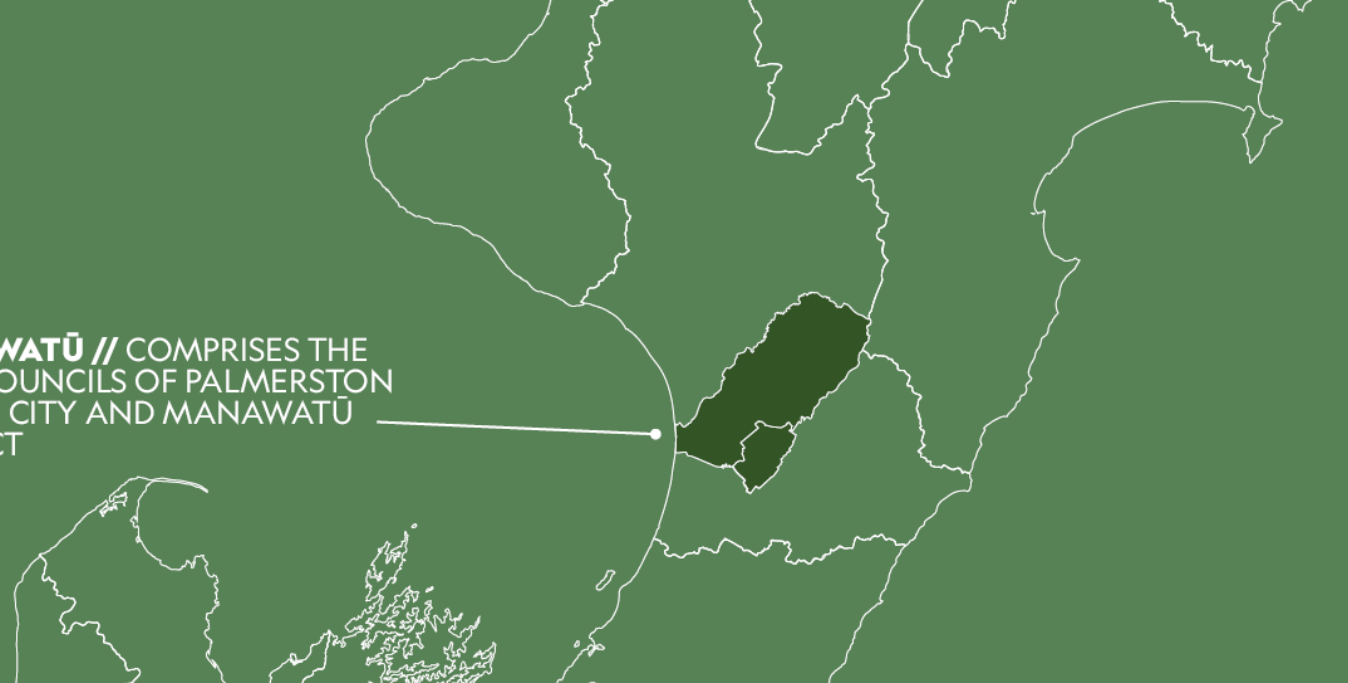
### A GROWER GUIDE

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**CEDA**  
CENTRAL ECONOMIC  
DEVELOPMENT AGENCY

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**MANAWATŪ**



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DISTRICT

## **WHEAT, BARLEY AND OATS // CEREAL CROP OPPORTUNITIES FOR DIVERSIFIED FARM SYSTEMS**

**Wheat, barley, and oats are cool-season cereal grains well-suited to the Manawātū region. Their role in both feed and food production, combined with their compatibility in crop rotations, makes them valuable diversification options for arable and mixed systems.**

This guide supports growers exploring cereals as part of broader cropping strategies in Manawātū. Developed by the Central Economic Development Agency, this guide was created as part of the [Manawātū Regional Food Strategy](#).

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# SUITABLE WHEAT VARIETIES + CHARACTERISTICS

**The Manawatū region's climate and soil conditions offer a favourable environment for growing a range of cereal crops.**

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

Selecting the right variety is essential for aligning with market demands, managing disease pressure, and ensuring seasonal suitability. Each cereal type has distinct agronomic strengths and end-use applications that should be considered when planning a commercial venture.

Wheat is a versatile cereal crop with varieties tailored for either feed or milling purposes. The choice between hard and soft wheat will influence its suitability for baking or processing.

## CHARACTERISTICS OF WHEAT

- > **Feed wheat:** High-yielding and well-suited for livestock feed and industrial processing.
- > **Milling wheat:** Grown under stricter quality specifications for flour production.
- > **Hard wheat:** Typically used in bread-making due to its higher protein content.
- > **Soft wheat:** Favoured for biscuits, cakes and other soft baked goods.

### Wheat varieties likely to suit the Manawatū region include:

- > **Sable, Empress, Discovery:** Noted for strong disease resistance and adaptability to lower North Island conditions.
- > **Reliance:** A widely grown milling wheat with consistent performance.



# SUITABLE BARLEY VARIETIES + CHARACTERISTICS

**Barley is a fast-maturing cereal crop with varieties suited for feed or malting. Its adaptability and yield potential make it a popular choice for commercial growers.**

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

Choosing the right type of barley is essential, as each group and variety brings different characteristics that can influence harvest timing, yield, and market potential.

## CHARACTERISTICS OF BARLEY

- > **Feed barley:** High-yielding and commonly grown for livestock feed.
- > **Malting barley:** Cultivated to meet specific quality standards for brewing.

**Barley varieties likely to suit the Manawatū region include:**

- > **Planet, Laureate:** Offer strong yield potential and malting quality.
- > **Cassia, Fairview:** Feed types with good resistance to lodging, ideal for stable crop stands.



# SUITABLE OAT VARIETIES + CHARACTERISTICS

**Oats are a flexible crop with grain, forage and dual-purpose varieties available. Their use spans milling, stockfeed, silage and green feed.**

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

Choosing the right type of oat is essential, as each group and variety brings different characteristics that can influence harvest timing, yield, and market potential.

## CHARACTERISTICS OF OATS

- > **Grain oats:** Used for milling and stockfeed.
- > **Forage oats:** Grown for silage, grazing or green feed.
- > **Dual-purpose oats:** Can be harvested for silage or left to mature for grain.

**Oat varieties likely to suit the Manawatū region include:**

- > **Cartier, Weston, Maheno:** Grain types suitable for milling and feed.
- > **Tucson, Milton:** Forage and dual-purpose types offering flexibility in harvest timing and use.



# SELECTING A SITE

**Before selecting a site for growing cereals such as wheat, barley or oats, it is important to understand the soil and climate conditions that will support optimal crop performance and yield.**

Each cereal type has slightly different tolerances, but all benefit from well-prepared land and thoughtful site selection.

Cereal crops perform best in fertile, well-structured loamy soils with good drainage. While heavy or compacted soils can be used, they must be well-managed to avoid waterlogging and root restriction. Soils with a history of good structure and organic matter content are ideal for supporting healthy root development and nutrient uptake.

## **Ideal soil conditions for cereals:**

- > **Soil type:** Loam or well-managed clay loam
- > **PH range:** 5.8–6.5
- > **Drainage:** Free-draining soils are preferred to avoid water stress or disease
- > **Sunlight:** Full sun exposure is essential for strong tillering and grain fill



### Climate considerations:

Cereals grow well in cool to mild conditions, with an optimal temperature range of 10–22°C. Reliable winter to spring rainfall supports establishment and early growth, though most cereal crops can tolerate dry periods post establishment.

### Crop-specific tolerances:

- > **Barley:** More drought-tolerant than wheat, making it suitable for lighter soils or areas with lower rainfall.
- > **Oats:** More tolerant of heavy, acidic or poorly drained soils, making them a good option where drainage is a concern.

As cereals are typically grown over a 4–6 month period, ensuring the soil is in good condition prior to sowing is essential. This includes addressing compaction, nutrient deficiencies and drainage issues well ahead of planting. A soil test is recommended to guide any amendments needed for pH or fertility, and resources such as Ballance's soil testing guide can assist in this process.





# PLANTING INSTRUCTIONS

**Successful establishment of cereal crops such as wheat, barley and oats begins with careful attention to planting timing, soil preparation and seeding technique.**

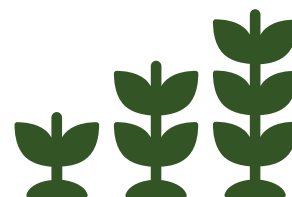
## **Timing and seasonal considerations:**

Cereals are best planted in autumn, between March and May, to take advantage of cooler temperatures and reliable moisture. Autumn sowing promotes deeper root growth and generally results in higher yields. However, spring planting between August and October is also possible, particularly in lighter soils or where autumn planting is delayed. Spring sowing may require more careful moisture management.

## **Soil preparation and depth:**

Prior to planting, soil should be loosened to a depth of at least 30–40 cm to reduce compaction and improve aeration. This supports root penetration and enhances access to water and nutrients. Soil should be friable and free draining with moisture present at the time of sowing. Avoid turning over the soil profile, as this can disrupt soil horizons and microbial balance.

Cereal seed should be drilled at a depth of 3–5 cm, adjusted according to soil moisture levels and seed size. Deeper sowing may be required in drier conditions to ensure good seed-to-soil contact.



### Seeding rates and spacing:

Seeding rates vary by crop type and intended use. The following rates are recommended per hectare:

- > **Wheat:** 120–180 kg (targeting 250–350 plants/m<sup>2</sup>)
- > **Barley:** 110–160 kg (targeting 275–350 plants/m<sup>2</sup>)
- > **Oats:** Grain 100–160 kg or Forage: 80–120 kg

Spacing between rows should allow for adequate sunlight, air circulation and root expansion. While exact row spacing may vary depending on equipment and field conditions, maintaining consistent plant density is key to reducing competition and improving crop uniformity.

### Seed quality:

Use certified seed to minimise the risk of disease and ensure genetic purity. Certified seed also supports uniform germination and crop performance, which is especially important for milling and malting end-uses.



# FERTILISING + CARE

**Cereal crops such as wheat, barley and oats require a well-balanced nutrient programme to support vigorous growth, strong root development and optimal grain production.**

As heavy feeders, cereals particularly benefit from adequate nitrogen, though phosphorus, potassium and sulphur also play key roles in plant health and yield outcomes. Soil testing is essential prior to sowing to determine baseline nutrient levels and guide fertiliser application. This ensures nutrients are applied efficiently and avoids over- or under-fertilisation, which can negatively impact crop performance.

Ongoing fertilisation should be based on soil test results and tailored to the plant's seasonal needs.

**Fertiliser application can be approached in phases:**

## **Phase 1 – Establishment and early growth:**

Apply nitrogen-rich fertiliser at sowing to support early leaf and root development. This is especially important for wheat and barley, which are more responsive to nitrogen than oats.

- > **Recommended nitrogen rate:** 80–150 kg/ha total, split across sowing, tillering and pre-boot stages.
- > **Phosphorus:** 25–40 kg/ha, applied at planting to aid root establishment.
- > **Sulphur:** 15–30 kg/ha, to support protein synthesis and enzyme activity.



## Phase 2 – Mid-season and grain fill:

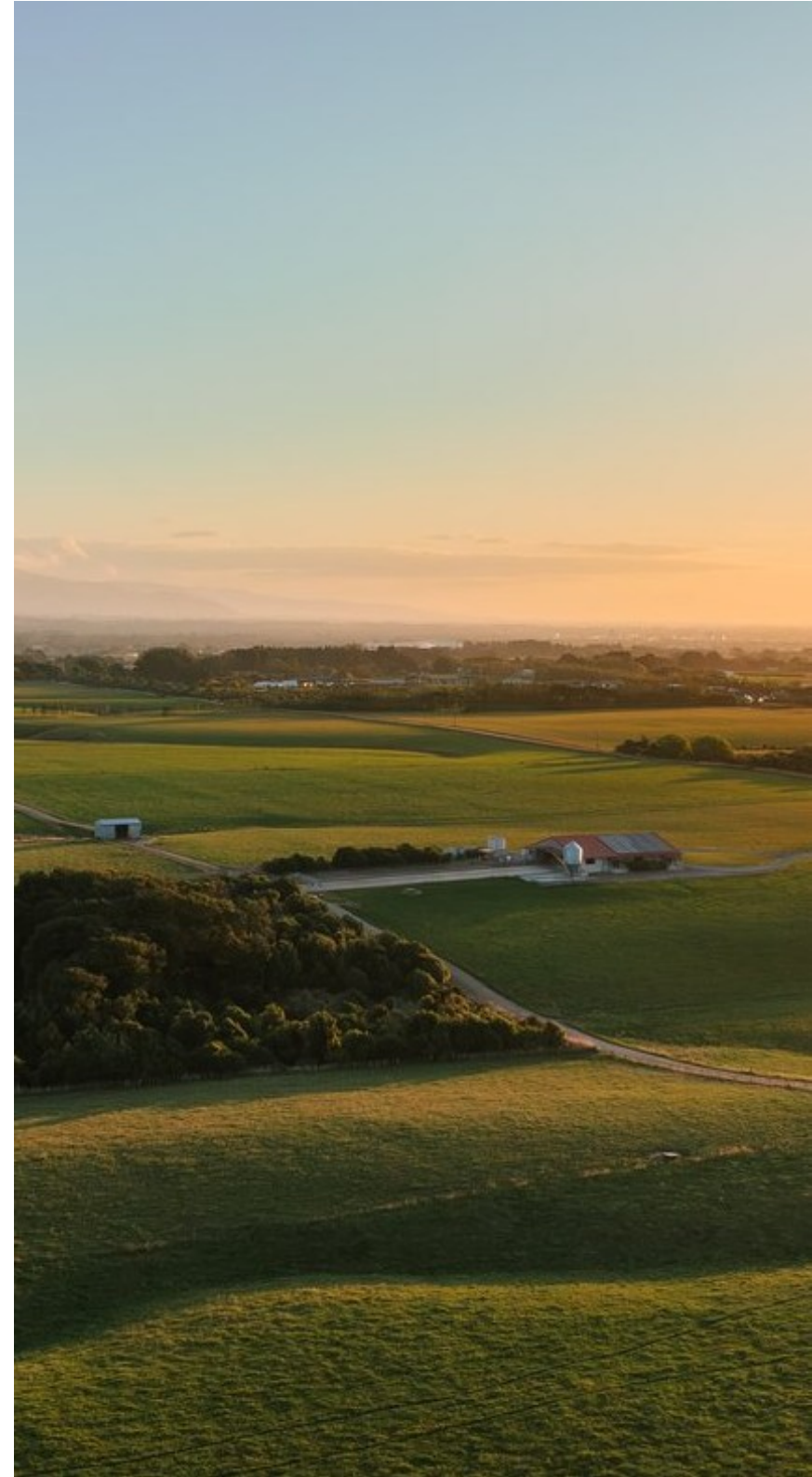
Monitor crop condition and apply additional nitrogen if required, particularly during tillering and stem elongation.

- > **Potassium:** 40–80 kg/ha may be needed if soil levels are low, especially in lighter soils or where previous crops have depleted reserves.

## Crop Specific considerations:

- > **Barley:** Sensitive to excessive nitrogen, which can lead to lodging; where plants fall over due to lush growth and weak stems. This is particularly common in spring conditions with high moisture and warmth
- > **Oats:** Generally more tolerant of lower nitrogen levels and perform well in soils with moderate fertility.

Nutrient uptake is reduced in cold soils, so avoid heavy fertiliser applications when temperatures are below 10–12°C. A balanced approach tailored to soil conditions and crop type will support healthy growth and maximise yield potential.



# WEED, PEST + DISEASE MANAGEMENT

**Cereal crops are vulnerable to a range of weed, pest and disease pressures, particularly during early establishment and key growth stages.**

Effective management requires a combination of cultural practices, monitoring and timely intervention to protect crop health and yield potential.

## **Weed control strategies:**

Weeds compete aggressively for nutrients, moisture and light, especially during the early growth phase when cereals are still establishing.

## **To reduce weed pressure:**

- > Consider early sowing, which allows cereals to outcompete many common weed species.
- > Avoid planting into paddocks with a high weed seed bank, as this increases the likelihood of competition and herbicide reliance.
- > Use pre- and post-emergence herbicides as part of a planned programme to suppress weed growth and maintain crop vigour.



## Pest management considerations:

Several pests can impact cereals, particularly in damp or mild conditions. Regular field monitoring is essential to detect early signs of damage.

- > **Slugs and springtails:** These pests target young seedlings, especially in moist soils, and can cause poor emergence or shredded leaves.
- > **Aphids:** Known vectors of barley yellow dwarf virus, aphids should be monitored closely in spring. Threshold-based insecticide application may be required.
- > **Armyworm:** Occasional outbreaks may occur in late spring or summer crops, with caterpillars feeding on leaves and causing defoliation.

## Disease management approach:

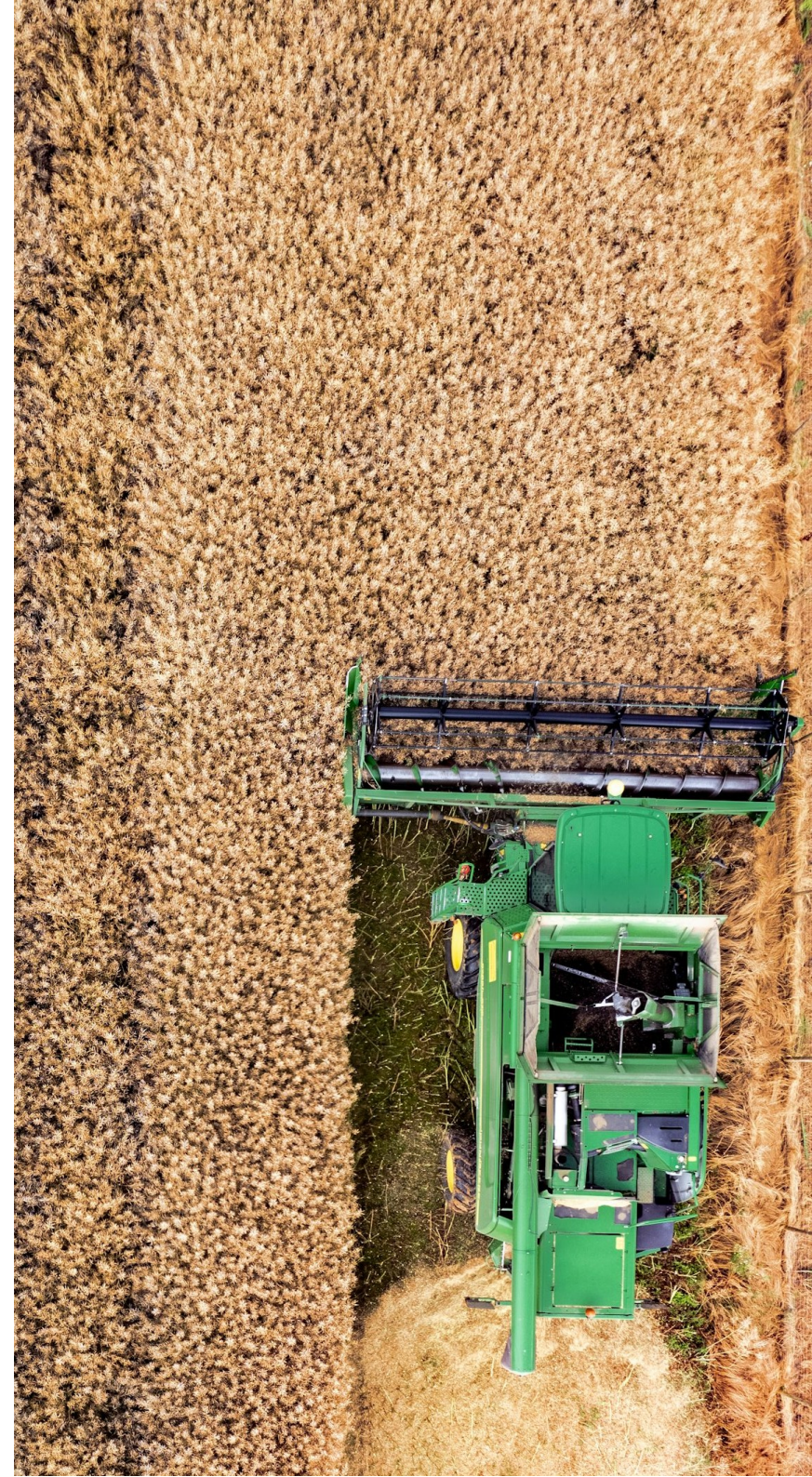
Cereal crops are susceptible to a range of fungal diseases, many of which are influenced by weather conditions and crop history.

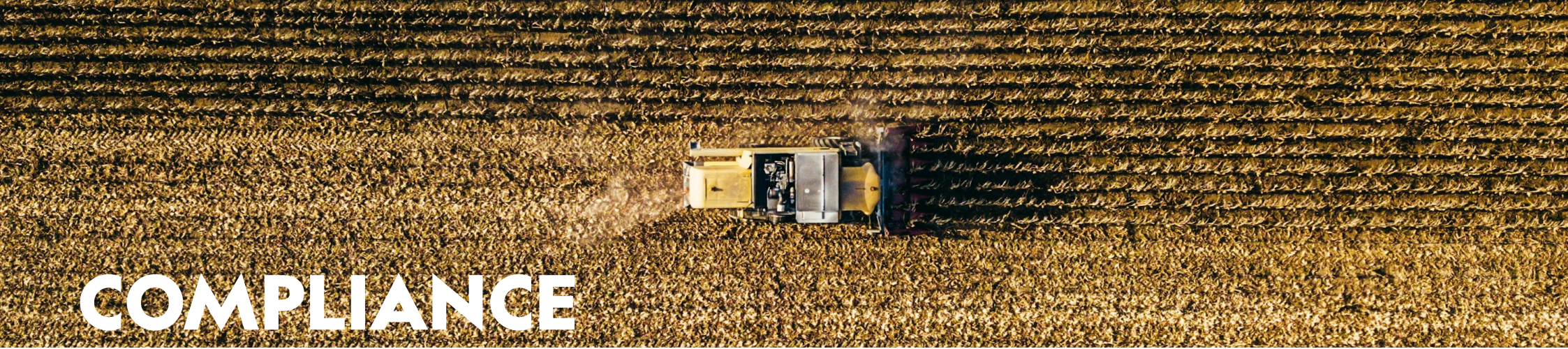
- > **Wheat:** Key diseases include stripe rust, leaf rust, Septoria and Fusarium head blight.
- > **Barley:** Watch for net blotch, scald and rusts.
- > **Oats:** Common issues include crown rust and leaf blotch.

## To reduce disease risk, growers should adopt an integrated management strategy that includes:

- > Crop rotation to break disease cycles and reduce pathogen load.
- > Resistant varieties suited to local conditions and known disease pressures.
- > Fungicide applications timed to protect vulnerable growth stages such as tillering and heading.

Regular field checks and a proactive approach to crop protection will help ensure healthy growth and maximise yield potential.





# COMPLIANCE

**Growers producing wheat, barley or oats for commercial supply, whether for feed, food, seed or specialty markets, must be aware of the compliance requirements that support food safety, traceability and market access.**

These requirements vary depending on the crop's end use, with stricter standards applying to milling, malting and export channels.

## **Key compliance areas:**

- > **Certification schemes:** Growers should operate under recognised programmes such as NZGAP or an equivalent standard. These schemes provide assurance around environmental management, food safety and worker welfare.
- > **Record-keeping:** Full documentation of fertiliser, pesticide and seed use is required. This includes application timing, rates and withholding periods, and supports both traceability and audit readiness.
- > **Pesticide use:** All agrichemical applications must comply with label rates and withholding periods. This is particularly important for crops entering food or seed markets, where residue limits apply.
- > **Harvest hygiene:** For crops destined for milling or malting, post-harvest handling must minimise contamination. This includes clean equipment, storage protocols and separation from feed-grade grain.



### Specialty and export considerations:

- > **Grading and testing:** Crops entering specialty markets (e.g. malting barley) may require additional quality testing, such as germination rates, protein content or moisture levels.
- > **Export protocols:** For grain destined for overseas markets, growers may need to meet phytosanitary and residue testing requirements. These vary by destination and should be confirmed with exporters or industry bodies.

Maintaining high compliance standards not only supports market access but also builds trust with processors, buyers and consumers. Growers are encouraged to stay informed of evolving requirements and engage with industry partners to ensure their practices align with current expectations.





# HARVESTING + STORAGE

## **Harvest timing for cereal crops is influenced by sowing date, seasonal conditions and crop type.**

Close observation of crop maturity and grain moisture is essential to ensure quality is preserved during harvest and storage.

### **Harvest timing:**

Cereals are typically harvested between late November and January, depending on when they were sown and how the season progresses. Grain should be harvested when moisture content is below 14% to ensure safe storage and reduce the risk of spoilage. Harvesting too early can result in immature grain with lower test weights, while delaying harvest increases the risk of weather damage and lodging.

For forage oats, the optimal harvest window is at the boot to early head stage, when feed value is highest and digestibility is maximised.

### **Harvesting considerations:**

Care should be taken during harvest to avoid mechanical

damage to the grain, particularly for crops destined for milling or malting. If desiccation is used to assist with even ripening or weed control, ensure that label withholding periods are strictly followed to maintain compliance and market access.

### **Storage best practices:**

Once harvested, grain should be stored in clean, dry bins or silos equipped with aeration systems to manage temperature and moisture. This helps prevent the development of mould and reduces the risk of insect activity.

- > Monitor regularly for signs of weevil activity, mould or condensation.
- > Segregate grain by variety and quality, especially for crops intended for specific markets such as malting barley or milling wheat.
- > Ensure all storage facilities are cleaned prior to use and that grain is cooled gradually to safe storage temperatures.

Maintaining grain quality post-harvest is just as important as achieving high yields in the paddock. A well-managed harvest and storage process will protect the value of the crop and support access to premium markets.



# FINANCIAL INFORMATION

**Growing wheat, barley and oats in the Manawatū region presents a valuable opportunity for growers seeking to diversify their income streams.**

These cereal crops not only contribute to rotational planning and soil health but also offer access to a range of market channels, from feed and food to specialty processing.

## **Yields and production:**

Yield potential varies by crop type, end use and seasonal conditions. Well-managed crops typically produce:

- > **Wheat:** Feed: 8–11 tonnes per hectare and Milling: 6–9 tonnes per hectare (subject to stricter quality specifications)
- > **Barley:** Feed: 7–10 tonnes per hectare and Malting: 6–8 tonnes per hectare (quality-dependent)
- > **Oats:** Grain: 5–7 tonnes per hectare and Forage: 8–12 tonnes per hectare dry matter (DM)

Crop selection should align with market demand and agronomic suitability. For example, malting barley requires specific protein levels and germination rates, while forage oats are valued for their flexibility in feed budgeting.



### Indicative market prices (2024-25):

Prices fluctuate based on quality, contract terms and market conditions. The following ranges provide a general guide:

- > **Feed wheat/barley:** \$400–600 per tonne
- > **Milling wheat:** \$550–750 per tonne (contract dependent)
- > **Malting barley:** \$600–750 per tonne (if quality specifications are met)
- > **Grain oats:** \$450–650 per tonne
- > **Forage oats:** Typically valued at \$0.25–\$0.35 per kg DM

### Market positioning and diversification:

These cereals play a strategic role in supporting farm system resilience. They can be rotated with legumes or high-value crops to improve soil structure, manage nutrient cycles and reduce disease pressure. Specialty markets such as milling and malting offer premium returns but require attention to crop quality and post-harvest handling.



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