- True winter wheat
- Very high yielding feed wheat
- Suits mid to late autumn planting
- Excellent disease resistance
- Good robust second year wheat

**DESCRIPTION**

**Einstein** is a very high yielding true winter wheat, bred in the United Kingdom by Nickerson Seeds Limited, developed in New Zealand by PGG Wrightson Seeds at the Kimihia Research Centre (KRC), and now sublicenced by Cates Grain and Seed Limited. **Einstein** currently has a full recommendation status on the UK Winter Wheat Recommendation Variety List.

**Einstein** has demonstrated characteristics which best suit the animal feed industry.
PERFORMANCE

EINSTEIN is suitable for all New Zealand winter wheat growing regions. EINSTEIN has a good resistance to most of the common foliar diseases in New Zealand and has a good rating for standing power.

EINSTEIN has been a standout cultivar, consistently topping or being in the top three of all recent trials for yield, standing capability and handling disease pressure.

![FAR CPT - Harvest Results 2007/08. Preliminary Autumn Sown Wheat Results](image)

<table>
<thead>
<tr>
<th>CULTIVAR</th>
<th>Methven (dryland)</th>
<th>Bulls (dryland)</th>
<th>Savannah</th>
<th>Phoenix</th>
<th>Alberic</th>
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</thead>
<tbody>
<tr>
<td>Harvest ton/ha</td>
<td>11.4</td>
<td>12.5</td>
<td>12.7</td>
<td>12.7</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>11.2</td>
<td>12.7</td>
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<tr>
<td></td>
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<td>11.7</td>
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</tr>
</tbody>
</table>

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HUSBANDRY

Sowing Date
It is recommended that EINSTEIN is sown late April to May where possible. Sowing rates need to be revised when sowing into cool and wet seedbed conditions in late autumn / early winter.

True winter wheat like EINSTEIN is likely to have a significant yield advantage when sown at an earlier date (late April or early May) versus later sowing dates (June). Late June / early July are the absolute latest time sowing should take place due to the high vernalisation requirement.

Maturity
EINSTEIN is approximately five days earlier flowering date than the wheat cultivar Claire.

Sowing Rate
EINSTEIN has a moderate tillering capacity. A target population of typically 150 plants / m² is recommended for April to mid May sowings (which will vary with sowing date and specific soil conditions); producing sowing rates of approximately 90 - 100 kg/ha depending on thousand-seed weight and germination percent. For later sowing into June, a target population of 200 plants / m² is recommended.

Generally, field emergence of 80 – 90 % from autumn sown wheat can be expected, depending on soil conditions. Drill at less than8 km/hr with a well-maintained drill at a depth no greater than 5 cm into a weed, pest and disease free seedbed. Aim for a good, even establishment.

Sowing Rate = 1000 seed weight \times \text{Desired Plant Population} \over \text{Effective Field Emergence}

It is important to consider thousand-seed weight and the percentage seed germination when calculating sowing rates.

Optimal sowing rates will enhance standing power, help to reduce disease pressure, decrease evapotranspiration rates and make efficient use of limited resources.

Seed Treatment
Seed treatment is recommended for Fusarium and other seedling diseases. Poncho or Gaucho insecticide treatment can also be very beneficial against early aphid attack when sowing early.
Strategic Nitrogen Use

A number of factors can impact on determining nitrogen amounts and timing. **EINSTEIN**, being a winter wheat is not designed to produce significant vegetative growth until spring. The need for an early application of nitrogen should be determined by a winter plant population count followed by an early spring tiller per plant count (multiplied gives tillers / m$^2$ which equates to ears / m$^2$ at harvest). If counts are low (less than 600) then early nitrogen (40 kgN/ha) should be applied to encourage additional tillering to achieve the optimum 600 ears / m$^2$ at harvest. It is important not to encourage too many tillers and therefore ears as this increases the competition for limited resources, increases disease pressure, reduces standing power and increases evaportranspiration rates. If there are sufficient tillers per plant, no nitrogen is required till Growth stage (GS) 31 – 32 (first or second node), where $1/3$ to $1/2$ of the nitrogen can be applied and the remainder two to three weeks later at GS 39 (flag leaf fully emerged). High yielding feed wheat’s will need at least 180 kgN/ha but account for paddock history and residual soil nitrogen, which may only benefit the crop later in development, depending on the position within the soil profile.

It is important that your nitrogen strategy is customized for each individual situation.

Growth Regulator

**EINSTEIN** requires a plant growth regulator (PGR) to prevent lodging especially in high yielding and vigorous growing conditions. The breeders suggest that for yield potentials over 8 ton/ha, insurance applications of a growth regulator are beneficial – they recommend 2 litres of Chlormequat at GS 30. Our New Zealand experience with other cultivars suggests for yield potentials over 8 ton/ha then the combination of 1.25 litres/ha of Chlormequat and 100-200 ml/ha of Moddus at GS 30 is beneficial. **EINSTEIN** has a “HGCA resistance to lodging rating of 7 without PGR application (Claire = 6, Savannah = 7)” (Source: HGCA Recommended List).

Disease

**EINSTEIN** has a good overall rating for disease resistance and these ratings are not expected to change during the life of the cultivar. With normal control measures in place this level of genetic resistance should ensure that growers do not experience severe disease problems, except in very high risk situations.
**Insecticide**
Crops should be protected from BYDV by controlling aphids. Gaucho or Poncho seed treatment provides seedling protection from grass grub and early season aphids. Early sown **EINSTEIN** may need two applications of aphicide – either as Gaucho/Poncho plus foliar aphicide, or two foliar aphicides where seed treatment is not used. Latest work by FAR on Gaucho persistence indicates regardless of sowing date a foliar aphicide should be applied at the start of tillering (GS 21) as Gaucho/Poncho protection is limited after this. If Gaucho seed treatment is not used then a foliar aphicide programme needs to be applied, starting at GS 12 – 13 (two – three leaf unfolded).

**Second Wheat Suitability**
**EINSTEIN** has produced excellent results in the United Kingdom as a second/continuous wheat (3 % above Tanker, 6 % above Consort, - a cultivar preferred as a second wheat by many growers). (Source: HGCA Recommended List Winter Wheat 2005/06).
Einstein is a robust wheat capable of high yields over many different land types.

**Fungicide**
A broad-spectrum fungicide should be applied at timings that will protect the yield producing top three leaves and ear (T1 or GS 31-32, T2 or GS 39 & T3 or GS59). The flag leaf timing (T2) is the most critical. UK trail data suggests good responses from the use of strobilurins in the fungicide programme. Since **EINSTEIN** shows some susceptibility to Speckled Leaf Blotch (UK data), a T1 (GS 31-32) application may be critical depending on disease pressure. A possible programme would be based on three sprays of Triazoles (Proline or Opus) at moderate rates with a strobilurin added to T2 and T3 (Amistar or Fandango). Triazoles must be tanked mixed wherever strobilurins are used.
Harvest

**EINSTEIN** is a robust wheat with low sprouting risk. **EINSTEIN** should be harvested as soon as practical to protect quality of the end-product and ensure good sale ability.

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