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# Cereals for grazing

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## Role of cereals in grazing

Forage cereals play an important role in many grazing enterprises by helping to overcome winter feed shortages. They have higher winter growth rates than most pastures (see Figure 1 for a typical example), and with their higher carrying capacity are able to ease the grazing pressure on pasture paddocks.

All cereals can be grazed, but some have been specifically bred for grazing, with emphasis on dry matter (feed) recovery after grazing, and in many cases also on grain recovery. Saving autumn growth from early-sown crops, particularly in high tableland areas, can be used to carry feed through into winter. Forage cereals can also play an important role prior to sowing a pasture by aiding in weed control and paddock preparation.

## Choosing a cereal

For overall forage production, oats will generally produce more forage than will wheat, barley, cereal rye or triticale. The total amount of feed available will be influenced by the type of crop, variety, disease resistance and sowing time.

Grain recovery is not so clear-cut, with winter wheats and triticale often having yields comparable or better than those of oats. Where a grain harvest following grazing is required, specific dual-purpose varieties should be chosen.

Cereals that produce large awns can cause mouth injuries to livestock, and should be avoided for hay production or where head emergence under grazing cannot be controlled. These cereals include barley, triticale, cereal rye and some wheats.

Selecting crop types or varieties tolerant of root and/or leaf diseases will lessen the disease impact in susceptible situations (see the *Winter crop variety sowing guide*). Where annual grass control (e.g. vulpia, soft brome, barley grass and ryegrass) has been poor in the winter/spring prior to sowing, cereal root diseases are likely to cause serious production losses, particularly on non-acid soils. Highly susceptible crops such as wheat and barley should be avoided; cereal rye has good tolerance, with oats the next best, followed by triticale.

Barley yellow dwarf virus is a serious disease on the slopes and tablelands. Large losses of both dry matter and grain production can occur when susceptible crops (especially oats and barley) are sown early. Tolerance of barley yellow dwarf virus will therefore influence crop and variety choice.

Quality tests on the forage of oats, wheat, barley, cereal rye and triticale, when grown under similar conditions, show no significant differences in levels of protein, energy and digestibility. Therefore, a cereal with higher grain returns may be chosen as an alternative to oats.

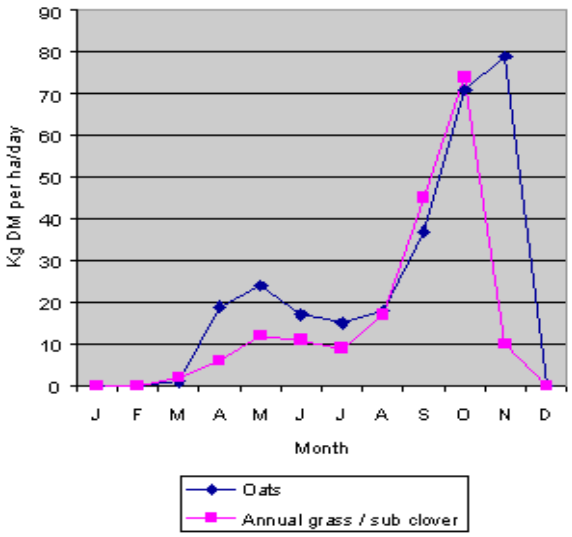


*Figure 1. The estimated growth rates of oats and of annual grass / sub clover on the Central Tablelands. Source: PROGRAZE® manual.*

Soil acidity will also influence cereal choice as species and varieties vary in tolerance. Even when highly acid soils are limed, acid-tolerant types may still need to be considered where the subsoil remains acidic.

## Growth habits

Knowledge of the winter habit and maturing time of varieties (see the *Winter crop variety sowing guide*) will influence the choice of variety, sowing time and expected grazing performance.

## Winter habit

Varieties with a strong winter habit (e.g. Brennan wheat, Blackbutt oats) are suitable for early sowing, as head initiation does not occur until there has been exposure to periods of cold temperature. This requirement for a cold period is called vernalisation, and exposure can be cumulative. Once these requirements have been met, head emergence begins as temperatures rise and day length increases.

The degree of winter habit will depend on the genetics of the varieties. Varieties described as semi-winter types have a shorter vernalisation requirement to initiate heading.

### Late maturing

Late-maturing cereals do not necessarily have a strong winter habit. Without the requirement for vernalisation, these types, when sown early in warm or long day conditions, will quickly initiate heads. These immature heads are concealed in the tiller, and removing them by grazing or cutting results in the death of the tiller. Regrowth is then significantly delayed and total forage production reduced as plants are forced into producing new tillers, a slow process that can take weeks.

Late-maturing types without a winter habit, when sown early, often require quick and early grazings to retard early growth and head emergence. This earlier-than-normal grazing will assist subsequent regrowth.

## Plant management

### Sowing

Cereals used for either grazing or grain production will attain maximum production only if:

- seed rates are kept high
- crop nutrition is adequate.

Optimum seed rates will vary with climate and area of the state, and local advice should be sought. Optimum nutrition requirements will likewise vary according to climate, soil type and paddock history.

Wide row sowings should be avoided if maximum dry matter and grain yields are to be achieved. In an experiment on a light granite soil at Gulgong, in the lower Central Tablelands, a 25 cm row spacing was compared with the normal 17.5 cm row spacing. The 25 cm row spacing resulted in a reduction of nearly 12% in early dry matter yields of Coolabah oats. Wide row spacings, however, while reducing potential yield and increasing the risk of weed invasion, may aid in the reduction of leaf diseases by allowing better air movement through the crop.

Early sowings are important for early winter and total fodder production. On the tablelands, early sowing is especially important to allow good growth before cold winter temperatures restrict growth.

### Fertiliser

Fertiliser rates for grazing crops should generally be higher than for grain-only crops, owing to the longer growing season.

Phosphorus (P) rates in the range 15–25 kg/ha should be considered, but this will depend on soil tests, paddock history, anticipated yield and soil type.

Nitrogen (N) application requires particular attention unless there has been a recent history of good legume growth. A good oat crop used for grazing and grain could be expected to use up to 100 kg/ha of nitrogen. Both pre-emergent and post-emergent applications of nitrogen can be used in nitrogen-deficient situations. With long-season dual-purpose cereals, split applications should be considered.

### Insects

Redlegged earth mites and blue oat mites are the most widely occurring insects that attack grazing crops. Their effect is worse in moisture-stressed crops, and in these situations may require treatment. Adding an insecticide to the spring fallow herbicide can aid in their suppression.

Army worms can also attack crops, usually grain crops as they ripen. Chewed leaf margins and spikelets on the ground indicate their presence.

If insecticides are used for insect control, the withholding periods must be observed before introducing grazing stock.

### Weeds

Planning in the previous season to prevent annual weeds from seeding helps to reduce in-crop weeds and improves crop production. This is especially so for grass weeds. Control can be through pasture cleaning, topping or early fallowing.

**Warning**

Pesticide residues may occur in animals treated with pesticides, or fed any crop product, including crop waste, that has been sprayed with pesticides. It is the responsibility of the person applying a pesticide to do all things necessary to avoid spray drift onto adjoining land or waterways.

In-crop herbicide usage can depend on crop type as herbicides can be registered for use on some crops but not others, or the rates specified on the label may be different for different crops. For example, the maximum label rate for 2,4-D amine (500 g/L) on wheat is 2.1 L/ha, while on oats it is 1 L/ha. (See the warning above.)

If herbicides are used for weed control, withholding periods must be observed before introducing grazing stock. Some grass herbicides have withholding periods of up to 60 days, which may affect grazing strategies.

Higher seeding rates help to compete against weeds, and maintaining crop canopy (bulk) will help to discourage weed recovery.

## Grazing management

### Grazing time

The earliest time to start grazing is when the plants are well anchored and reach the tillering stage (Zadok's growth stage 21–29, see *Winter crop variety sowing guide*). For most grazing types under good growing conditions, this will occur 6–8 weeks from plant emergence, depending on variety.

With winter types, by deferring early grazing, more feed can be accumulated and saved for winter. For erect types, crops will usually be 20–25 cm high, and for prostrate types 10–15 cm high.

Varieties without a strong winter habit but sown in early autumn should be grazed even before tillering to retard growth and subsequent premature stem elongation and head initiation. When stem elongation occurs, immature heads are located just above the highest node (joint). If these are removed, tiller death occurs. While the plant is usually able to produce more tillers, forage production (and grain production) is severely reduced.

The latest time for grazing and the severity of grazing of crops intended for grain recovery or hay production should be governed by the position of the immature head in the stem. Some growers opt to graze late and remove these heads, particularly if the crop or variety is prone to lodging. These growers choose to accept lower grain or hay yields as a trade-off for having a standing crop at harvest.

Late grazing of semi-dwarf types can also greatly reduce crop height, possibly causing subsequent harvesting problems in rocky or uneven paddocks.

### Frost

Frost injury to grazed crops can be severe, particularly if crops are only a few centimetres high and the soil is loose and dry. Under severe frosty conditions, stock should be removed nightly. Damage occurs to the plants' growing points and through the trampling of frost-covered leaves. Some crop varieties, particularly the oat varieties Blackbutt and Nile, have very low growing points, so this type of damage is minimal.

### Diseases

Diseases such as leaf rust on oats or powdery mildew on barley may also influence the timing and severity of grazing. By removing the canopy and opening up the crop, the incidence and severity of leaf diseases can be greatly reduced.

Barley yellow dwarf virus, sometimes a serious disease of early-sown susceptible crops (especially oats and barley), is best controlled by choosing tolerant varieties. When this is not possible, sowing in late autumn when aphid activity is lower will reduce the risk of infection.

### Scouring

All cereals in the vegetative stage under good growing conditions are highly digestible and often contain 80%–85% moisture (15%–20% dry matter). The resultant scouring is normal when stock are grazing on highly digestible, high-moisture, green feed.

Adding hay or roughage to the diet will slow down animal performance as the animal substitutes the higher quality forage with the hay or roughage. In some cases this may be of benefit, as it will extend the grazing life of the paddock.

Veterinary advice should be sought if abnormal scouring occurs, as this may be the result of internal parasites.

### Stocking densities

Stocking densities will depend on specific animal production targets. Research has shown that continuous grazing of winter forage cereals gives better animal performance, as the best feed on offer will always be selected. This will only be achieved if stocking rates are balanced with crop growth rates and the feed on offer is not being significantly depleted (see Table 1).

With continuous grazing, stock densities should be determined so as to leave plants with enough residual leaf material to enable both good regrowth

and high animal performance. Benchmarks exist for both instances. Residual plant heights of around 5–10 cm for prostrate types and 10–20 cm for upright types will correspond fairly closely to benchmarks of around 1000–1500 kg/ha for lactating ewes and fattening steers.

High stocking densities are used under rotational grazing but lower animal performance can be expected compared with continuous grazing. Rotational grazing can, however, be used to maximise the grazing value of a crop, by reducing wastage from trampling and/or frost damage or by the restriction of intake per head. Techniques such as strip grazing or limiting access times to the crop can be used for rationing feed.

*Table 1. Sustainable continuous stocking rate for oats.*

| Stock class | Kg of forage dry matter removed per head* | Sustained stocking rate/ha† |
|---|---|---|
| Ewe & lamb (six weeks) | 3.2 | 9.3 |
| Weaned lamb (30 kg) | 2.0 | 15 |
| 350 kg steer | 12.4 | 2.4 |
| 450 kg steer | 13.9 | 2.1 |
| Cow & calf (three months) | 19.1 | 1.5 |

* Calculated using GrazFeed™ for green oats at 2000 kg DM/ha, 20 cm tall, 73% DDM (digestible dry matter) assuming 25% spoilage rate.

† Assuming 30 kg DM/ha/day crop growth.

## Animal health disorders

Disorders can occur under certain growing conditions, and veterinary advice should be sought for animal treatment. The most likely disorders are:

- enterotoxaemia (pulpy kidney)
- hypomagnesaemia (grass tetany)
- hypocalcaemia (milk fever)
- nitrate/nitrite poisoning.

The possibility of these occurring should be considered when planning the grazing operation.

Seek advice and plan to minimise the possibility of animal health disorders, for example, ensure stock are vaccinated, graze classes of stock that are less likely to suffer from grass tetany and be careful with introducing stock to grazing crops. Never put hungry stock straight onto a young crop.

## Further reading

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