

Tetraploid vs Diploid Plants

Plant characteristics.

The main difference between diploid and tetraploid ryegrass is the number of chromosomes per cell. Diploid plants have two sets of chromosomes per cell whilst tetraploids have four. Tetraploids have an increased cell size due to this and have a higher ratio of cell contents (soluble carbohydrates) to cell wall (fibre), indicating that they have a higher water content per cell. Diploid plants have more tillers per plant and due to the lower water content per cell have a higher dry matter per kg of feed and also more energy than tetraploid plants. Diploid and tetraploid plants have similar protein levels.

Animal performance benefits.

Tetraploid ryegrasses offer several benefits in terms of animal performance. These are all due to the higher ratio of cell contents to cell wall in the tetraploid plants. One benefit is that it is more palatable to animals which improves intake and therefore leads to an increased animal production. In addition tetraploid cell contents consist of rapidly available nutrients, such as sugars and starches necessary for more efficient rumen function. However it is important to remember that tetraploids have a higher water content in the cells so when livestock are full from grazing the actual dry matter intake could be lower compared to that of diploid plants. A mix of tetraploid and diploid ryegrass could achieve a more balanced pasture retaining a good level of dry matter production, an improved balance of quality feed and if used for silage will be more easily cured than a pure tetraploid pasture.

Grazing management.

It is important to monitor grazing pressures on tetraploid ryegrasses as they are sensitive to overgrazing because of their excellent palatability. If grazing occurs to a lower level than with diploid ryegrasses it may compromise persistence. Similar to diploid ryegrasses, tetraploid ryegrass require nitrogen applications to a similar level to ensure good growth after grazing.

Farm management benefits.

Tetraploid ryegrasses have higher establishment costs than diploids as the recommended sowing rate for tetraploids is higher due to the larger size of the seed (2-3 times heavier). If planting tetraploid ryegrass in a mix, the plants will allow up to 10% more clover in the pasture due to the reduced tiller density promoting an increased pasture quality.

If you have any further questions on Tetraploid or Diploid ryegrasses please contact us using our details below.



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