3. Cultivar selection

Plant breeding has promoted the introduction of many cultivars each with different characteristics. Breeders have developed tetraploid ryegrasses which have slightly different plant characteristics from diploid ryegrasses.

The main physiological 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[11]. The physical difference due to this is that tetraploid ryegrasses have wider leaves and bigger seeds than diploid plants. A study in the UK investigated the tiller density of evenly grazed tetraploid and diploid swards. They found that in the 3rd year the diploid ryegrass sward had a 23% higher tiller density than tetraploid swards[12]. The high tiller density was observed in the SEPWA pasture trials however overall, there was no yield differences detected between them (see Chapter 7). The open growth habit of tetraploid ryegrass makes it more suitable for mixes as a higher clover content can be achieved[12], generally up to 10% more clover in the sward.

The open growth habit of tetraploid ryegrass makes it more suitable for mixes as a higher clover content can be achieved.

Acosta[13] investigated the differences in nutritional value between diploid and tetraploid perennial ryegrass. Acosta concluded that the intracellular nitrogen content was higher in the tetraploid than the diploid ryegrass but no other differences were detected in the other chemical composition parameters measured[15]. Intracellular nitrogen content contributes to the production of wool, meat and conceptus[14] but no indication was given that the higher nitrogen levels resulted in a significant production difference in this study.

A balanced composition of a tetraploid ryegrass and subclover.

Tetraploid ryegrasses have higher establishment costs than diploids as the recommended sowing rate is higher due to the larger size of the seed (2-3 times larger) (Table 3.1)[11].

Table 3.1: Seed cost for Diploid and Tetraploid ryegrasses[15].

	Diploid	Tetraploid
Seed per kg	500,000	255,000
Recommended sowing rate	15–25 kg/ha	25–35 kg/ha
Number of seeds per ha sown at 25 kg/ha, based on 70% effective establishment	8,750,000 seeds / ha	4,462,500 seeds/ha
Cost	$60-100 / ha	$87-122 / ha

What defines an annual from a perennial?

Annual ryegrass survives from seeds, it will typically have a higher winter spring production than perennial ryegrass however it will lose quality quickly at the end of the season. A perennial ryegrass survives from tillers however some varieties will act as an annual at the end of the season and shed its seeds. Typically a perennial will have better quality and a higher yield at the end of the season.

One of the advantages of establishing ryegrass is the potential to increase winter and spring production which can increase livestock carrying capacity and extend the growing season if the correct grazing management is applied.