The pro's and con's of using Clearfield Barley as a cover crop when sowing serradella pastures

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Aim:

Serradella is a useful pasture species on the sandy soils of the West Midlands. But it has two major weaknesses: weed control (particularly radish and capeweed) and a lack of early biomass production. By sowing serradella with a Clearfield Barley variety (Scope or Spartacus) and using Clearfield (Imidazolinone) herbicides both of these weaknesses can be overcome.
The aim of this demonstration was to highlight the pro's and con's of using Clearfield Barley as a cover crop when sowing serradella pastures.

Method:

The demonstration was conducted on a deep pale yellow sand at the West Midlands Group Main Trial Site on "Glenruff", west of Moora. It was sown on the 13 May 2016 using a Cone Seeder.
The four "seed" treatments were:

1) Spartacus Barley (80kg/ha)
2) Spartacus Barley (80kg/ha) + Margarita Serradella (1kg/ha)
3) Spartacus Barley (16kg/ha) + Margarita Serradella (5kg/ha)
4) Margarita Serradella (5kg/ha)

The three "herbicide" treatments were:

1) Control
2) 50g/ha Spinnaker (Post-Sowing Pre-Emergent – 13 May 2016)
3) 40g/ha Raptor (Post-Emergent – 7 July 2016)

All plots received 100kg/ha of Gusto Gold (10N, 13P, 12K, 7.5S) at seeding. The plots containing Spartacus Barley also received 50kg/ha of Urea at seeding. The plots containing Spartacus Barley sown at the 80kg/ha sowing rate received 100kg/ha of Urea on 15 July, while the plots containing Spartacus Barley sown at the 16kg/ha sowing rate received 50kg/ha of Urea on 15 July.
The herbicide treatments were applied as cross strips perpendicular to the seeding treatments.
The trial was assessed for edible biomass production (feed on offer >5cm in height) on 15 July 2016 and again on 23 August 2016. The trial was mowed with a lawnmower at 5cm height after each biomass assessment to simulate grazing.

Results:

Edible biomass production at the first grazing was highest in the treatments with 80kg/ha of barley sown. The treatment with 16kg/ha of sown barley was only marginally less productive due to increased tillering. The pure serradella treatment did not produce any edible biomass (>5cm) at the first grazing.

Edible biomass production at the second grazing showed a similar trend to the first grazing, with high rates of barley slightly more productive than the lower rate of barley. These treatments were significantly more productive than the pure serradella treatment. The barley had bolted and reached ear emergence, so the feed quality of the barley would have been significantly lower than the serradella.

Table 1: Edible biomass production (kg/ha) from each treatment at the first and second grazing.

Treatment	**Edible Biomass (kg/ha) 15/07/16**	**Edible Biomass (kg/ha) 23/08/16**
Barley 80g/ha	624	1632
Barley 80kg/ha + Serradella 1kg/ha	624	1940
Barley 16kg/ha + Serradella 5kg/ha	520	1460
Serradella 5kg/ha	0	320

The herbicide treatments had no visual impact on serradella and barley biomass production, and as the weed burden was low and variable across the plots, weed counts were not conducted.

Discussion:

This demonstration clearly showed that by adding a small amount of barley (16kg/ha) to serradella when re-seeding, early winter feed for livestock can be significantly increased. However, as the photos from early September indicate, the serradella growth in spring can be held back due to competition from the barley. Increasing the frequency and intensity of grazing would help, as would the application of a grass selective herbicide to kill the barley in early spring when feed is becoming abundant. If the season was very poor, the barley might be left to increase total pasture production and groundcover for summer.

Figure 1: The 80kg/ha Spartacus Barley plot immediately prior to the first grazing on 13 July 2016.

Figure 2: The 5kg/ha Serradella + 16kg/ha Spartacus Barley plot immediately prior to the first grazing on 13 July 2016.

Figure 3: The 5kg/ha Serradella plot immediately prior to the first grazing on 13 July 2016.

Figure 4: The 5kg/ha Serradella + 16kg/ha Spartacus Barley plot immediately prior to its second grazing on 23 August 2016. Note how the Barley has already reached ear emergence.

Figure 5: The 5kg/ha Serradella plot on 6 September 2016 re-growing rapidly after the second grazing on 23 August 2016.

Figure 6: The 5kg/ha Serradella + 16kg/ha Barley plot had significantly less serradella biomass than the adjoining pure serradella plot (right) on 6 September 2016.