# Living Mulches: which species to choose?

*Learnings from our research at Denby Hall Farm*

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Working with Denby Hall Farm, we trialed five potential companion crops to work out which was most suitable for use as a living mulch in an organic, minimum-tillage farming system alongside cereal crops. The living mulches were established in August and the crop in October. We found:

- No significant differences found between treatments this season, would be interesting to measure differences in year 2. Species composition may not be a critical decision when designing living mulch systems.
- Successful establishment was key to crop and mulch performance in all species considered.
- Persian clover generated the most biomass and senesced in time for harvest.

| AberAce White Clover | Rivendel White Clover | Virgo Pajberg Black Medic only | Leo Birds Foot Trefoil only | Persian Clover |
|---|---|---|---|---|
| £17.50 /kg | £25.00 /kg | £15.10 /kg | £18.90 /kg | £10.90 /kg |

*Seed cost indication for March 2025*

## AberAce White Clover *Trifolium Repens*

*"Slow growing, small clover. Took a long time to establish"*



**Seed rate:** 8kg/ha - £17.50/kg

**Plant architecture/growing habits –** Perennial species with small leaves and a creeping growth habit. It remains short and forms a low understory layer beneath the cereal crop. Its rooting depth is similar to that of cereals, which may increase competition for nutrients and water and potentially affects crop performance.

**Spring Cover and Harvest Biomass –** Relatively good cover in establishment year and persists well. Fresh biomass production was not significantly different from other mixes (438 ± 90 g/ m²).

## Rivendel White Clover *Trifolium Repens*

*"Similar to AberAce, small and slow growing clover. It also took a long time to establish"*



**Seed rates:** 8kg/ha - £25.00/kg

**Plant architecture/growing habits**: Small leaved perennial clover, remains short and forms a low understory layer beneath the cereal crop. As with AberAce, rooting depth is similar to that of cereals which may lead to competition with the crop.

**Spring Cover and Harvest Biomass -** Medium cover with some difficulty to establish observed in the field. It appears less competitive than AberAce and may be of interest to reduce competition with the main crop especially in the 2nd year of LM system. Biomass no different from other mixes (436 ± 90 g/ m²).

## AberAce White Clover + Virgo Pajberg Black Medic *Medicago Lupulina*

*" Both Black Medic and Birds' Foot Trefoil should limit competition with the wheat and enhance farmland wildlife and soil biodiversity but both could grow too large and interfere with harvest if the plant become tall and rambly in its' second year of growth."*

**Seed rates -** Aberace 4.2kg/ha – £17.50/kg, Virgo Pajberg 3.2 kg/ha £15.10/kg

**Plant architecture/growing habits –** Legume with a deep tap root and low growth habit. It has a short life cycle: dying off after flowering and self-seeding. It can complement white clover in a mix and limit competition with the main crop.

**Spring Cover and Biomass learnings** – Variable ground cover due to difficult establishment of the black medic combined with a lower rate of AberAce. Biomass at harvest did not significantly differ from other mixes. The slightly higher results suggests that when successfully stablished, Black Medic has the potential to produce relatively high biomass (483 ± 90 g/ m²).

## AberAce White Clover + Leo Birds' Foot Trefoil *Lotus corniculatus*



**Seed rates** - Aberace 4.2kg/ha - £17.50/kg Leo 3.2kg/ha - £18.90/kg

**Plant architecture/growing habits –** Perennial legume with a long tap root which can help reduce competition with the main crop for nutrient and water. It has an upright to prostrate growth habit due to its numerous stems.

**Spring Cover and Biomass Learnings -** Similarly to the AberAce/Black Medic mixture, cover in spring was limited due to challenging establishment of the trefoil and the lower seed rate of white clover. Biomass production was not significantly different from other mixes nor showed any specific trend (443 ± 90 g/ m²).

# AberAce White Clover + Persian Clover

***Trifolium respinatum***

*"Biggest surprise of them all! The Persian clover was intended to be an N-fixing 'nurse' clover to the smaller Aberace and die back over winter to leave the Aberace to slowly grow out in the base. However, it didn't die back and became a high-volume companion crop to the wheat during the growing season. Thankfully the Persian clover senesced completely before harvest being an annual plant and didn't interfere with harvest at all, and provided lots of seed for volunteers to grow alongside the second year's arable crop with the Aberace micro clover now well established"*

**Seed rates -** Aberace 8kg/ha £17.50/kg Persian 2kg/ha - £10.90/kg

**Plant architecture/growing habits -** Persian clover is an annual legume with rapid erected growth. It is tall but flowers early, self seeds and senesces before harvest. It can help weed suppression in spring. The white clover of the mix can take over once established.

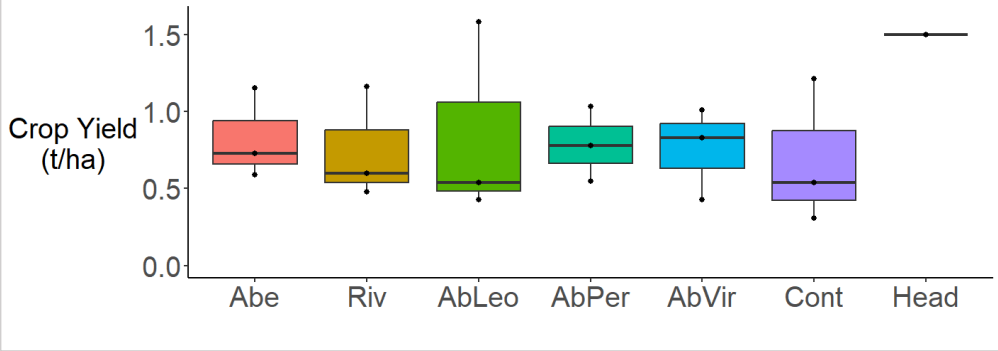
**Spring Cover and Biomass learnings –** The mix achieved relatively good ground cover due to AberAce seed rate and taller growth of the Persian clover. Cover was variable due to the uneven distribution of the Persian clover and fresh biomass at harvest did not significantly differ with the other mixes, probably due to the Persian clover early senescence (398 ± 90 g/ m²).





*Persian clover*

***No significant difference between mulch mixes on wheat yield***




We found no significant difference in yield between the mulch treatment strips, including the Controls (ANOVA, p = 0.75, F value = 0.55). Yields were up to 70% lower in mulch strips than Headlands (30cm depth tillage before drilling). This likely reflects the direct drill technique used for the wheat (see establishment fact sheet) and increased crop/mulch competition for nutrients and water.