

Introducing white clover into existing swards and getting variety choice right

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Full-reseeding v over-sowing

A full re-seed is considered the best means of getting clover into a sward especially for red clover leys and in a dense pasture eg. sheep pastures or old butty pastures with little possibility of the clover seed achieving an adequate soil seed-contact to make a “hit” and germinate.

Broadcasting clover seed into existing pastures on the other hand, offers a cheaper method with a 75% success rate at farm level, but the management of the sward before and after over-sowing is the key to success.

Sowing essentials

Successful establishment of white clover in the sward by over-sowing depends on:

- a) Contact between the soil and the seed to make a “hit” and allow germination
- b) Moist soil conditions
- c) Light penetrating down to the clover seed and seedlings; and
- d) Strong well-established seedlings to survive the Winter

Methods of over-sowing

Techniques using strip or slot-seeders are not recommended because they increase costs without improving the rate of successful clover establishment. Strip or slot seeders or scratching the soil surface with a harrow can also damage the sward and open it up to weed infestation. To that end, broadcasting methods using a standard fertilizer spreader or other specialised broadcasting equipment such as an air-seeder etc. are recommended. Putting clover seed into a slatted tank and then spreading the slurry is not a reliable method of getting even application of clover seed.

Time of over-sowing

Experience on farms and at Teagasc Solohead, Tipperary has shown that, in general, over-sowing works best after a harvest of silage during May or early June, compared to spreading on grazed swards. This is mainly because the grass recovers more quickly after grazing than after a silage cut, thus competing against the slower establishing clover seedling. Over-sowing in most years should really take place before late June. Over-sowing will be most successful in wet summers, in heavy rainfall areas in the West of the country and on heavier soils. Over-sowing is somewhat riskier on drier sandier soils in Eastern parts of the country and really should be carried out in May in these areas.

10 steps to successful clover over-sowing

1. Reseed with 5 kg of white clover seed per hectare. It is vital that organic clover (~€15/kg) or non-pelleted (naked) conventional clover (~€10/kg) is used. Pelleted clover which often contains artificial phosphorus (P) is **strictly prohibited** according to organic standards.
2. Ideally take a heavy cut of silage off the field and cut it very low to stunt the grass and make the sward as open as possible. Tight grazing over a long period is also an option before over-sowing.
3. Mix the clover seed with a mixing agent. Common mixing agents commonly used on organic farms are dry sand, granulated lime products or permitted natural granulated fertilizers (eg. sulphate of potash). Mix it in the field rather than in the yard and only mix half the amount first (each acre is spread twice – in two opposite directions). Spread about 5 to 10 acres at a time.

are small and close to the ground. Medium leaf varieties are intermediate in terms of yield and persistency, making them suitable primarily for grazing but also for silage.

Cattle and dairy cows are less selective grazers and graze less close to the ground than sheep. Therefore small-leaf cultivars are more at risk of being shaded out of a sward grazed. Large-leaf cultivars grow more aggressively and are better able to compete in swards grazed by cattle.

Table 1: DAFM Recommended White Clover Varieties 2017

Variety Name	Total Yield	Leaf Size*	Clover %	Year 1 st Listed	Breeder	Origin
Control Mean: (t DM/ha)	9.8					
Barblanca	105	Large (0.76)	50	2009	Barenbrug	NL
Alice	99	Large (0.73)	50	1995	IBERS	UK
Chieftain	98	Medium (0.68)	47	2005	Teagasc	IRL
Buddy	100	Medium (0.58)	45	2015	Teagasc	IRL
Avoca	103	Medium (0.58)	47	1995	Teagasc	IRL
Iona	94	Medium (0.56)	44	2014	Teagasc	IRL
Crusader	95	Medium (0.56)	42	2009	Barenbrug	NL
Aberherald	98	Medium (0.55)	45	2003	IBERS	UK
Coolfin	104	Small (0.51)	47	2017	Teagasc	IRL
Galway	95	Small (0.36)	38	2017	Teagasc	IRL
Aberace	99	Small (0.26)	33	2016	IBERS	UK

In the table above varieties are listed in order of decreasing leaf size. *Values in brackets indicate leaf size compared to the variety Aran (i.e. Aran = 1.00), based on data from UK D.U.S. tests.

The main features of each variety are highlighted below. These features should be used as the basis for choosing the varieties of clover suitable to your enterprise.

Barblanca:	A large leaved variety. Very good annual yield. Considered suitable for silage production and unsuitable for hard grazing.
Alice:	A large leaved variety. Good annual yield. Considered suitable for silage production and unsuitable for hard grazing.
Chieftain:	A medium leaved variety with good yield. It is the largest of the medium-leaved category. Considered suitable for grazing.
Buddy:	A medium leaved variety with good yield. Considered suitable for grazing.
Avoca:	A medium leaved variety with very good yield. It competes well with the accompanying grass. Considered suitable for grazing.
Iona:	A medium leaved variety. It competes well with the accompanying grass. Considered suitable for grazing.
Crusader:	A medium leaved variety. Considered suitable for grazing
Aberherald:	A medium leaved variety. Considered suitable for grazing.
Coolfin:	A small leaved variety. First year on the Recommended List. Very good annual yield. It competes well with the accompanying grass. Considered suitable for grazing.
Galway	A small leaved variety. First year on the Recommended List. Considered suitable for grazing
Aberace:	A small leaved variety and is currently the smallest on the Recommended List. Considered suitable for grazing.

Clover blends depend on enterprise

In general 2 varieties of clover are used in a mix. A combination, one from large, medium or smaller leaved varieties can lead to more successful establishment of clovers and can also allow for more flexibility of management. Some factors to consider when choosing a clover mix include yield, persistency and optimum growing season.

For sheep a suitable mixture of clover cultivars could contain Avoca and Aberherald. The emphasis of this blend of clover cultivars is more on persistence than yield.

For beef and dairy swards, a suitable mixture could contain Chieftain and Buddy. This blend is targeted more towards yield rather than persistency.

If the ley is to be used for the dual purposes of grazing and hay/silage, then a mixture of Chieftain and Barblanca could be used.

Finally, for silage-only leys the larger leaved clovers are most suitable, but could be mixed with a 3rd variety eg. Buddy or Avoca to ensure good growth and cover throughout the season.

Some management pointers

As white clover needs light to survive the winter, keeping swards well grazed in late autumn and spring makes a big difference to clover survival and productivity during the following growing season.

The Rhizobia bacteria associated with clover perform best in soils with good levels of phosphorus (P) and potassium (K) and high lime status and therefore white clover does not grow very well in acid and, in particular, peat soils.

White clover can be expected to perform best and make the greatest contribution to pasture productivity on free-draining loamy soils. These soils are light and therefore warm up relatively quickly.

Under normal circumstances the clover content declines slowly and virtually disappears from the sward over time. However, there is a large residual impact of clover on soil fertility. Even as the clover content of the sward declines to low levels, sward productivity can subsequently remain very high for a year or two. This is due to the residual (slow-release) impact of the clover on soil N supply

Conclusion

Organic farmers face challenges in terms of increasing output and maximising their returns. Grazed grass is the cheapest feed available to increase live-weight gain for grassland farmers. In grassland based organic farming systems, re-seeding with grass-clover swards plays a vital role in achieving higher margins. There are many methods available to establish successful grass clover pastures under organic conditions. Every field and farm situation is different, so there is no 'one size fits all' in terms of methods of re-seeding. All methods have their advantages and disadvantages, as outlined but the key is choosing the right method for your own farm situation. Regardless of the method chosen, good management (slurry and FYM for NPK, regular grazing of grazed grass-white clover swards and avoiding poaching) is especially important to produce a long lasting successful organic re-seed.



White clover stolon, roots (with nodules) and leaves. Clover stolons will spread much greater distances once they have light reaching them.



An open sward and moist soil conditions provide ideal conditions for introducing clover seedlings by low-cost over-sowing method. Clover seedlings become established in open patches in the sward. It is important that the sward is kept well grazed out after over-sowing.



Unpelleted (naked) clover and a mixing agent are mixed in the field instead of the yard to avoid the tiny clover seed from falling to the bottom of the spreader.