



Technique timing & depth

Renew pasture

Sow

Renewal methods

Cultivation	Spray-drill	Undersow	Oversow
In spring, spray appropriate herbicide(s), cultivate & sow summer crop ▼ Feed off crop over summer ▼ Spray crop residue ▼ Light cultivation ▼ Drill seed ▼ Light graze 6-10 weeks later	Hard graze ▼ Allow to regrow (e.g. 7-21 days) & spray with appropriate herbicide(s) ▼ Graze 3-7 days after spraying, per grazing WHPs on herbicide(s); direct drill seed into pasture ▼ Plan to graze 6 weeks post sowing.	 Hard graze (no herbicide) & direct drill seed into thin pasture ▼ Graze normally	 Spray if particular weeds present ▼ Hard graze ▼ Broadcast treated seed on ▼ Trample in with stock

Cultivation

Positives	Negatives
■ Most consistent germination ■ Best weed control if appropriate herbicides are used ■ Can break up previous soil pans ■ Can level paddock, repair pugging ■ Can incorporate fertiliser/lime ■ Can break pest cycle	■ Most expensive ■ Buries fertile top soil, reduces organic matter in the short term, disrupts biological activity ■ Potential soil compaction, erosion ■ Releases soil N & carbon ■ Softer, more prone to treading during establishment

Spray & drill

Positives	Negatives
■ Appropriate herbicide controls competition ■ Faster than cultivation	■ Less opportunity to correct pH ■ Won't break up previous soil pans or level paddock

■ Quicker to first grazing ■ Protects soil structure ■ Fewer emissions ■ Reduced environmental impact	■ May revert to old pasture faster than cultivation ■ Insects and slugs usually need control during establishment ■ Higher risk of uneven germination
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Undersow

Positives	Negatives
■ Cheap & simple ■ Italian ryegrass (e.g. Tabu+) can boost winter-early spring growth.	■ Doesn't work in dense pastures ■ Doesn't control invasive weeds ■ Usually only a temporary fix

Oversow

Positives	Negatives
■ Can introduce legumes & N fixation ■ Can apply with fertiliser ■ Often used for hill country to introduce new species into uncultivable land.	■ Variable results ■ Hard to control competition

Sowing date of grasses

Sowing date affects pasture persistence. Early autumn sowing is important in summerdry areas, so plants have time to reach a robust size, prior to the following summer.

Autumn sowing date

In autumn, late sowing means slower establishment due to the cooler temperatures. Young plants then have less time to reach a robust size (e.g. grasses >20 tillers) to help their persistence, before the (potentially dry) summer. Once we reach 1 March, sowing into dry conditions, before rain, and letting rain germinate seed allows faster establishment than waiting for rain before sowing. In these conditions research has shown *NEA2* endophyte survives well in the soil for up to 6 weeks before rain. Some species, such as brome grasses and tall fescue, need more warmth than ryegrass to establish well, and must be sown early when soil temperatures are consistently >12°C. If you are serious about planting these, use a summer fallow to build up soil moisture, then direct-drill. This can greatly reduce the risk of poor establishment in dry autumns.

With later sowing and slower establishment, the potential to pug and damage new pastures in winter and spring is greater, because plants are smaller and weaker.

Spring sowing date

Spring pasture sowing requires reliable summer moisture for young pastures to establish, so cannot be reliably used in many regions. However, spring sowing is regularly undertaken in areas with good summer rainfall (e.g. Southland, the West Coast and some higher altitude areas), and irrigation (e.g. Canterbury and Otago).

Sowing date is a balancing act between getting new pasture in as soon as possible, and avoiding the risk of cold temperatures slowing establishment, which often leads to high weed content. As a general rule, wait until soil temperatures are >10°C before sowing ryegrass, and >12°C for brome grasses and tall fescue.

Seedbed consolidation

A level seedbed greatly improves pasture establishment, particularly for clover.

Seedling establishment

Seedbed consolidation conserves moisture and allows a seed drill to achieve the right sowing depth.

Research in the Manawatu showed sowing with a V-roller into a well-consolidated seedbed gave 50% better white clover and 25% better ryegrass establishment than sowing into a poorly consolidated seedbed.

Seedlings at establishment*

	Lightly consolidated	Well consolidated
Clover	240/m ²	375/m ²
Ryegrass	280/m ²	360/m ²

**Proceedings NZ Grasslands Association 67 (2005): p35-39. Brock J. et. al.*

In this case a Cambridge roller was weighted with concrete posts, to compact the soil until the roll form held under normal walking pressure. This research also highlighted the bad practice of using rubber wheeled rollers, which do not compact the soil well.

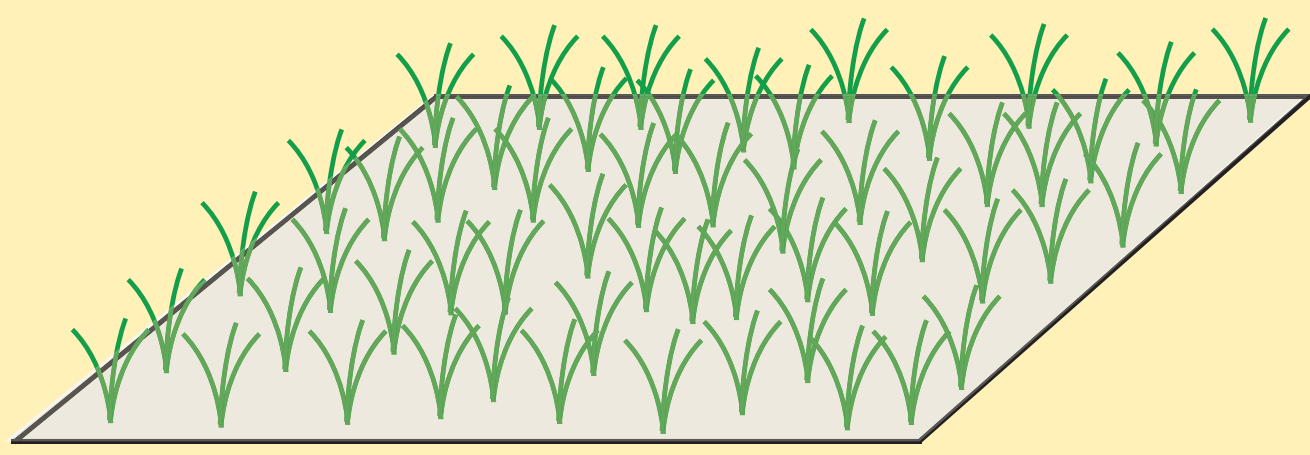
Drilling method

Drilling method is a critical decision when establishing new permanent pasture. Good ground cover, or density, at sowing improves clover establishment and gives much better weed control.

Drilling methods

Spreading seed evenly

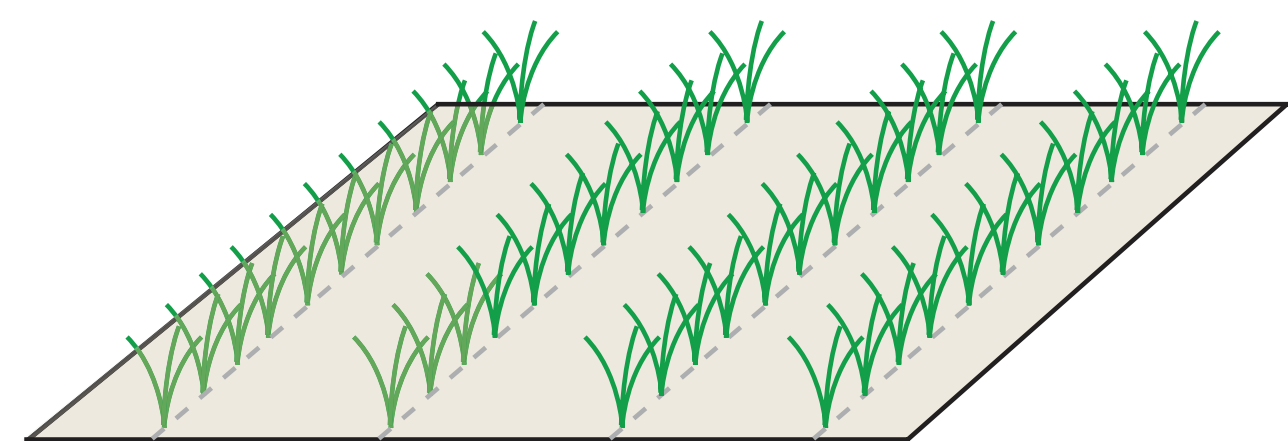
e.g. roller-drill, broadcast seed, drill with narrow row spacing



- Seed well spread over ground surface
- Good ground cover gives weed control
- More space for seedlings helps slower establishing clover

Drilling in rows

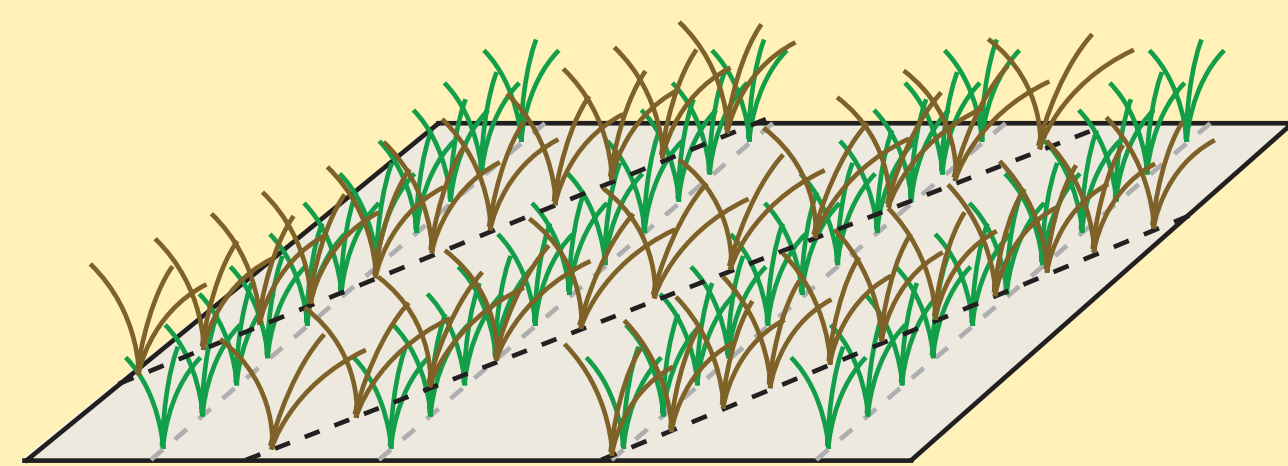
e.g. standard or direct-drill sowing in rows



- Seed placed tightly in rows
- Where ryegrass & clover are drilled together in the same row, clover suffers
- Space between rows for weeds

Cross-drill or diamond drill

e.g. sow with direct-drill in two directions



- Better ground coverage than one drill pass (better weed control)
- Clover happier than one drill pass as more space (but not as good as broadcasting).

Improve method?

Sometimes a drill or drilling method can be modified to get better ground coverage. If row drilling, for example, remove the tubes from under the seed box so seed simply sprinkles on the ground. Welding a ^ shaped angle iron under seed box can help seed spread. If direct drilling, sprinkle clover seed and 1/4 of ryegrass seed through a small seed box (with tubes removed) ahead of the main drill. Main drill coulters will help cover and sow this seed.



Bare ground between drill rows gives weeds room to germinate.

Sowing depth

Sow ryegrass/white clover seed mixes at around 10 mm depth to get the best establishment.

Dry conditions

The exception to sowing shallow is in dry conditions, when it is sometimes better to drill seed a little deeper into better soil moisture. In these conditions white clover may struggle, but seed can be spread on when conditions improve.

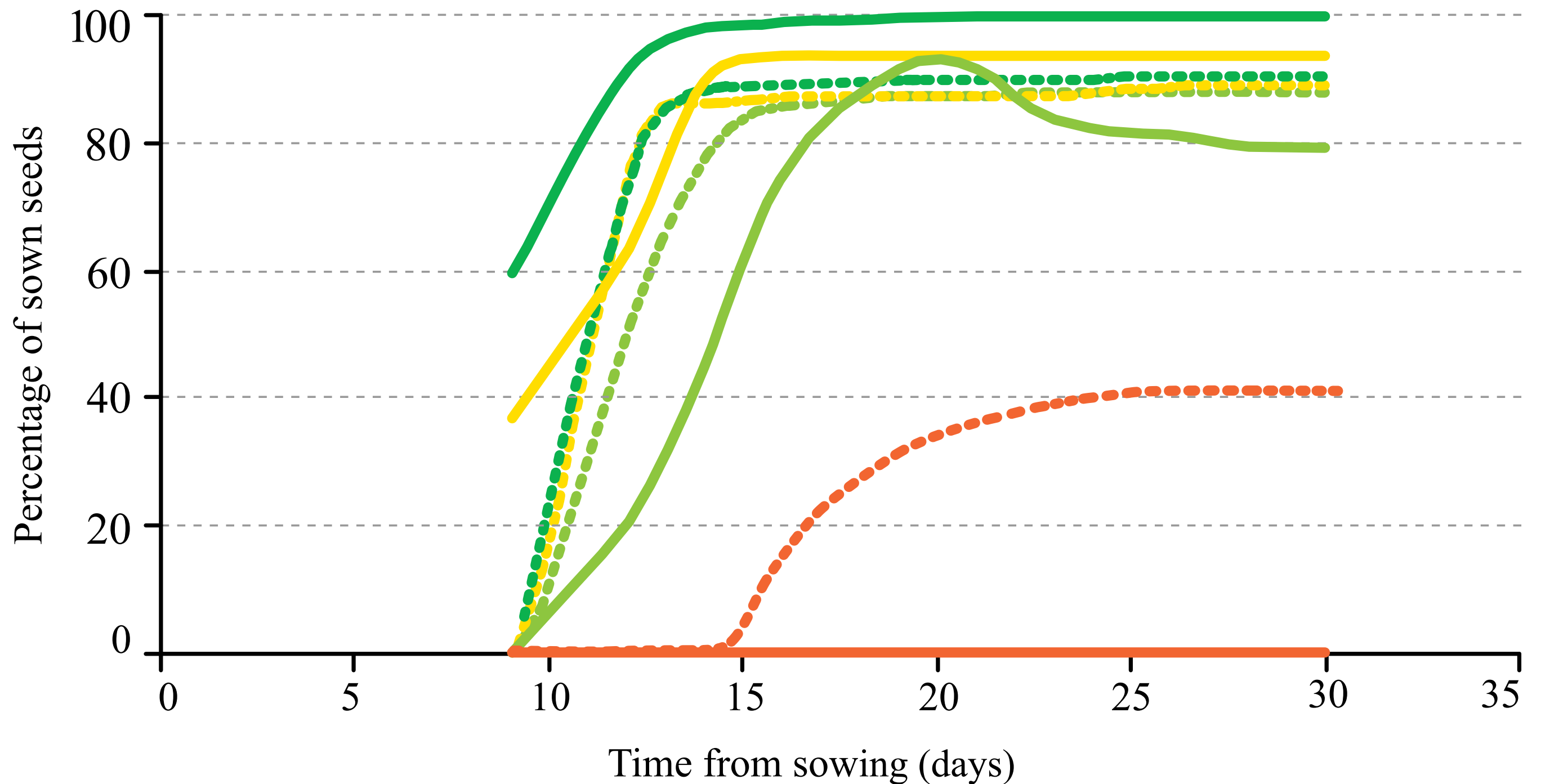
Consolidation

A consolidated seed bed is critical to allow good depth control with a seed drill. In a soft seedbed wheel tracks are pushed down, and coulter depths vary, leading to both uneven sowing depth and establishment. The same effects can occur when drilling too fast, causing uneven sowing depth.



Seedbed consolidation improves seedling establishment, achieved here only in the tyre tread pattern

Effect of sowing depth (mm) on ryegrass and clover establishment rate



White clover



5mm



10mm



20mm



50mm

Ryegrass



5mm



10mm



20mm



50mm

Better pasture together™

 **BARENBRUG**