

Drilling and Establishment Guide



For more detailed information on drill set-up and testing, please see BBRO's Sugar beet drill maintenance guide

Establishing your sugar beet crop at the optimum plant population of 100,000 plants per hectare is one of the most important drivers of yield.

However, it is important to ensure that germination is even and the plant population is uniformly established across the field with most plants at similar growth stages. This will ensure the most effective light interception by the crop, but is also vital for weed suppression and the reduction of aphid virus transmission.

Being flexible, patient and attentive to detail during cultivations has been shown to deliver the best results.

Check soils thoroughly before deciding on your cultivation and drilling strategy. Aim for good seed contact with moist soils. If this cannot be achieved due to excessive clods or compaction at depth, a compromise in practice may be required and can only be made by regularly checking the seedbed.



Optimum drilling depth

Additional drilling depth to place seed into moisture

Range of spacing width

Establishment - 000's plant/ha based on 50cm row widths								
Seed spacing (cm)	14	15	16	17	18	19	20	
Seed units/ha (unit = 100,000 seeds)	1.43	1.33	1.25	1.18	1.11	1.05	1.00	
90%	129	120	113	106	100	95	90	
80%	114	107	100	94	89	84	80	
70%	100	93	88	82	78	74	70	
60%	86	80	75	71	67	63	60	

Establishment - 000's plant/ha based on 45cm row widths							
Seed spacing (cm)	14	15	16	17	18	19	20
Seed units/ha (unit = 100,000 seeds)	1.59	1.48	1.39	1.31	1.23	1.17	1.11
90%	143	133	125	118	110	105	100
80%	127	118	111	105	98	94	89
70%	111	104	97	92	86	82	78
60%	95	88	83	79	74	70	67

Target:
100,000 plants
per hectare

For more information on seed rates, please see the BBRO Reference Book or Establishment guide.

Factors affecting field populations

Plant Population is a function of:

- Number of seeds sown
- % germination
- Losses during emergence and post-emergence up to the six-leaf stage when a plant is said to be established (i.e. likely to survive and produce a harvestable root)

In practice it is necessary to predict % establishment from a knowledge of existing and expected factors which affect germination and seedling growth:

- Typically seed sold in the UK has around 95% laboratory germination
- Germination in the field depends on the quality, future temperature and soil moisture content of the seedbed
- Uncovered or shallowly drilled seed is at risk from predation by mice
- Soil capping or crusting might impede emergence. The better the seedbed structure the more easily it can cope with heavy rainfall
- Seedlings can be prone to pest and disease attack pre and post-emergence
- Birds and small mammals graze seedlings and sometimes remove the growing point
- Seedlings may be at risk from extreme weather events e.g. frost

Cultivations and field operations

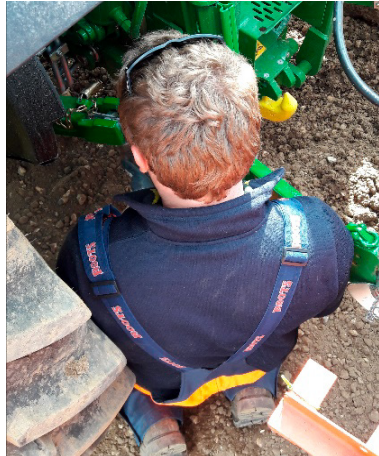
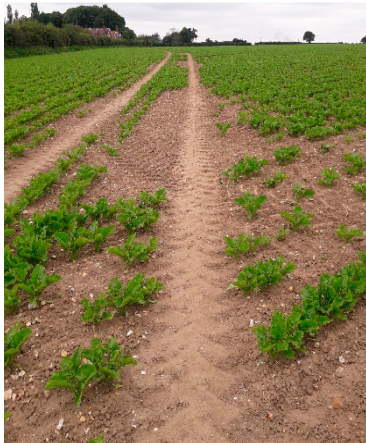
1. Manage machine weight where possible, remove any unnecessary weights/ballast.
2. Manage excess wheelings this should be considered when applying base fertilisers:
 - Use permanent tramlines or set lines just for this cropping year or (CTF)
 - If trying to remove wheelings, ensure effective loosening through profile.
3. Avoid over cultivation to reduce capping risk and soil moisture loss.
4. Monitor the cultivator (tine or disc), ensuring it is performing correctly without smearing or compacting especially when operating in high soil moisture.
5. Every machine should leave a level finish for the next operation to maximise performance including harvesting.



Drill set-up

1. Check and set your machine widths:

- Check chains
- Drop links
- Row width



2. Ensure row shut off are set-up/calibrated correctly before starting, this can take half a day. Operators should check stop and start distances.
3. Seed depth should be adjusted for individual seedbeds to ensure optimum access to moisture and establishment.
4. Check seed spacing

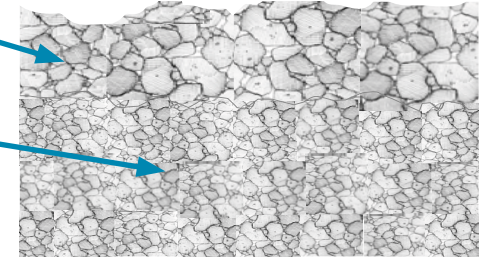


- ← Optimum drilling depth
- ← Additional drilling depth
Place seed into moisture

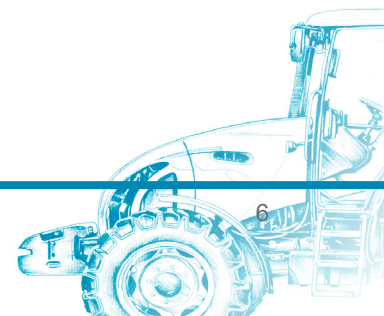
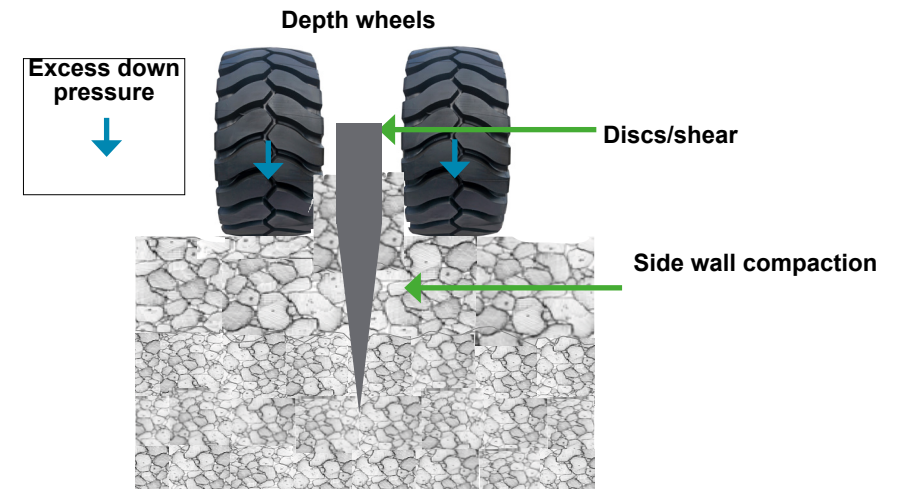
5. Having identified and set the drill to the optimum depth, down pressure should then be adjusted to ensure the target depth is achieved and maintained.

Coarse clods

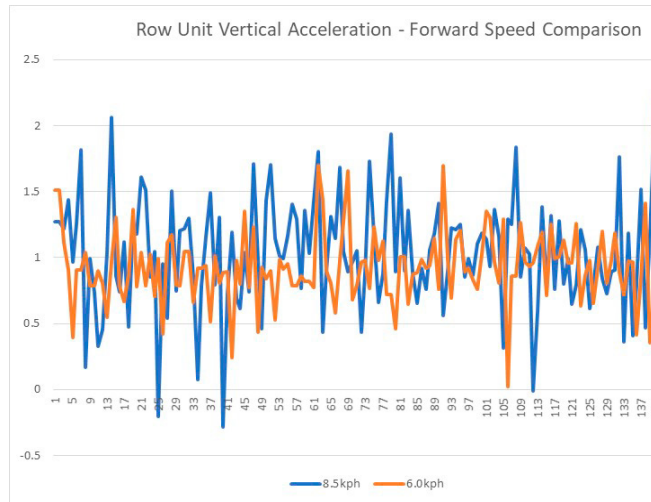
Fine particles



Excess down pressure can cause side wall compaction restricting plant development.



6. Forward speed should be adjusted to the seedbed conditions, reduced speeds can improve seed depth consistency

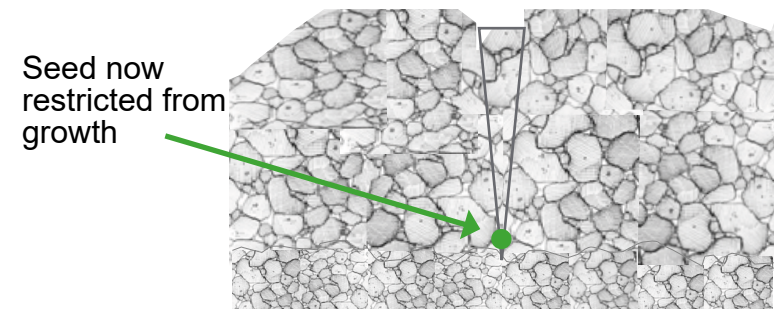


Optimise establishment

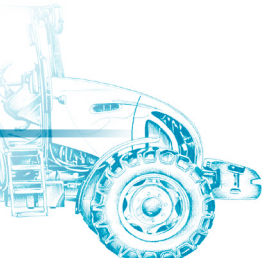
Sub-optimal seed bed preparation may result in large clods which will impede even germination and affect good crop establishment.



Rolling after drilling can be a benefit to aid soil to seed contact, but it can also have negative outcomes. If you have achieved a good friable soil to drill into within the row utilising clod pushers or row cleaners, rolling after drilling can push larger clods back into the seed trench, impeding germination and establishment even though it may look better visually. The decision to roll should be considered when setting up a drill, especially the use of clod pushers or row cleaners.



Consider the weather forecast before deciding to roll post drilling, rolling before heavy rain can increase the risk of soil capping.





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