



Drilling and seed rates

Introduction

Drilling at the correct time and with the correct seed rate is crucial to maximising yield. Optimum drill timing will depend on soil temperature and moisture levels and drilling should commence as soon as soil conditions are suitable. Your cultivation strategy should be planned to achieve completion of drilling by the end of March, should conditions allow. More information on cultivation is available in the **Tillage Fact File**.

Drilling after mid April could lead to yield losses of over 4 adjusted t/ha per week on average. However, it is important to note that crops drilled slightly later into good seedbeds, as opposed to earlier into poor seedbeds, often emerge and establish quicker. It is important not to drill by date alone, but to consider if conditions are suitable for drilling.

Seed spacing

Ideal spacing is 15-18cm for 50cm rows and 17-20cm for 45cm rows. Aim for a minimum of 1.25 units/ha; use a higher seed rate in poor seed bed conditions.

Key Points

- Soil temperature and moisture levels are key to determining when to drill
- Drilling should commence as soon as soil conditions allow for effective cultivations, without detrimental effect to soil structure
- Your cultivation strategy should allow for the completion of drilling by the end of March (should conditions allow)
- Drilling after mid-April could lead to yield losses of over 4 adjusted t/ha per week on average. However, crops drilled slightly later into good seedbeds, as opposed to earlier into poor seedbeds, often emerge and establish quicker. Don't drill by date alone.



Seed spacing should be checked regularly whilst drilling, adjusting if necessary. Poor seed spacing will be obvious at early stage of establishment, so remember to go back and check you got it right.

Plan to drill different varieties as distinct blocks rather than mixing varieties across drill units. This will allow you to monitor and manage different varieties appropriately. This may be important for the application of herbicides and fungicides as well as harvesting.

Drilling depth

Before drilling starts, set all row units to the same depth. Seed should be placed into moist soil, ideally drilled between 2-3cm depth. Check drilling depth regularly as it will vary within fields as well as between each field.

Drilling depth should be increased in dry conditions to ensure seed is placed into moist soil. Ensure all seed is well covered to help avoid mouse damage.

Drilling speed

Optimum drilling speed is between 5 and 8kph (3 to 5mph). To ensure optimum placement it is vital to travel at a suitable forward speed relative to seed bed conditions and cell wheel or seed disc fitted.

Seedbed

Land should be prepared in advance of drilling, ensuring a level seedbed and good soil structure. A poor uneven seedbed can lead to yield loss through reduced establishment and increased harvester losses.

Temperature and rainfall

Pay particular attention to soil temperature. Seed germination will start where soil temperatures are above 3°C but will be slow below 5°C. Germination can be adversely affected if heavy rainfall occurs within 48 hours of drilling.

Ensuring the correct seed rate

It is important that the correct seed rate is used to achieve the target of 100,000 plants/ha. A higher seed rate is required to account for seeds that do not germinate and plants that are lost before reaching establishment.

Percentage germination of UK seed is 95% with in field establishment typically 80%.

Establishing a uniform population of 100,000 established plants per hectare is arguably the single most important factor that drives high yields in sugar beet crops.

Hitting this 'target' requires a combination of a good seed bed and accurate drilling of seed into the seedbed.

This means in a 50cm row crop 1.25 units/ha need to be drilled to achieve the target population of 100,000 plants/ha. The seed rate tables below enable you to adjust seed rates based on row width and expected establishment to reach 100,000 plants/ha.

Was the seed rate correct?

It is useful to undertake plant counts to identify if you have achieved the target 100,000 plants/ha. The **Physiology and establishment Fact file** explains how to do this and factors that may affect establishment.

Establishment - 000s plants/ha based on 50cm row widths								
Seed Spacing (cm)	14	15	16	17	18	19	20	21
Seed units/ha (1 unit = 100,000 seeds)	1.43	1.33	1.25	1.18	1.11	1.05	1.00	0.95
90%	129	120	113	106	100	95	90	86
80%	114	107	100	94	89	84	80	76
70%	100	93	88	82	78	74	70	67
60%	86	80	75	71	67	63	60	57
50%	71	67	63	59	56	53	50	48
40%	57	53	50	47	44	42	40	38

Establishment - 000s plants/ha based on 45cm row widths								
Seed Spacing (cm)	14	15	16	17	18	19	20	21
Seed units/ha (1 unit = 100,000 seeds)	1.59	1.48	1.39	1.31	1.23	1.17	1.11	1.06
90%	143	133	125	118	111	105	100	95
80%	127	118	111	105	98	94	89	85
70%	111	104	97	92	86	82	78	74
60%	95	89	83	79	74	70	67	64
50%	80	74	70	66	62	59	56	53
40%	64	59	56	52	49	47	44	42

Plant populations below optimum requirements that may not produce maximum yields

Plant population above optimal requirements -will produce maximum yield but not maximum profit

Optimum plant population (+/- 5% of 100,000 plants/ha)