Soil Management

Ploughing

Ploughing should be carried out with the aim of producing a level finish for uniform soil weathering.

Ploughing at the correct time and under the correct conditions should allow for just one cultivation pass in the spring.

The optimum timing of ploughing depends on the soil type and prevailing weather conditions.

Heavy soils:

Plough before the end of October to maximise soil weathering.

Plough under dry conditions. Under wet conditions a smeared layer can be formed, particularly where the tractor furrow wheel is slipping. This can result in drainage problems and restricted root growth in the spring.

Heavy soils tend to leave an uneven surface when ploughed leading to the formation of hollows, which can reduce the benefit of overwinter soil weathering. In such instances it is advisable to carry out a cultivation to level the surface and break up the furrow slice. A furrow cracker or narrow ring furrow press have been shown to be beneficial in these circumstances.

Medium soils:

Plough from mid-October onwards with the aim of finishing before January.

Aim to produce a level finish but avoid the surface being too fine because a weak structure can cause furrows to run together and slumping to occur.

Soils that have slumped take longer to dry out in the spring, potentially delaying drilling.

Light soils:

Plough shortly before drilling to reduce the risk of drying, slumping and erosion.

The use of a wide ring press helps to improve consolidation and creates a rough soil surface to reduce the risk of soil erosion.

Spring cultivations

Aim for just one pass in the spring to create a level consolidated seedbed. A level seedbed is essential to reduce losses at harvest and allow seed to soil contact.

Timing is very important; go as early as possible but ensure soil moisture is at the correct level to prevent excessive compaction.

To reduce the risk of compaction, maximise vehicle footprint with wider tyres, dual wheels and reducing the tyre pressures. Look to minimise tractor weight with selection or remove all unnecessary ballast weights.

After spring cultivations and before drilling, consider doing a test dig to check for soil conditions and structure at depth.

Under optimum conditions

- Use a combination harrow working at a depth of 7-9cm (to create 5-7cm depth of seedbed)
- If a second pass is required, ensure low ground pressure to reduce excessive compaction

Non-inversion tillage

- Ideally before using this system for sugar beet, non-inversion tillage should have been used on two cereal crops. This allows organic matter and biological activity to accumulate in the upper layers of the topsoil
- After harvesting the cereal crop, either bale and remove the straw or chop and spread. Aim for the straw to be spread as evenly as possible and for the stubble length to be around 15cm
- A shallow cultivation may be required to encourage weed germination before the main cultivation

Under less than optimum conditions on heavy soils

- Use a combination harrow on the front of the tractor and a power harrow behind to carry out two passes in one travel of the field
- If an ideal seedbed cannot be created, consider rolling after drilling

Plant establishment has been shown to be higher in seedbeds that have a range of aggregate sizes with the majority less than 3mm. This allows aggregates to pack tightly together whilst still providing plenty of air gaps, ensuring good seed-soil contact for early root development and moisture retention. Seedbeds with large aggregate sizes (cloddy) will result in variable seed depth, poor water retention and poor soil-seed and root contact. Check the quality of the seedbed, which in some cases may warrant leaving until a better aggregate size can be produced.