Establishment of winter oilseed rape

Topic Sheet No. 15
Summer 1998

Background

Establishing uniform crops of oilseed rape can be difficult on clays. The seed is small, cereal residues are usually present, soils are dry and little time is available to create a fine seedbed. Prolonged emergence and patchy establishment cause uneven crop growth. This leads to problems with control of weeds and pigeons, spring management and harvesting. Yields fall and costs rise.

HGCA-funded work led by Professor Keith Scott at the University of Nottingham and ADAS has investigated the relationship between establishment and seedbed quality on a range of clay soils.

Phases of establishment

Seedlings and plants are vulnerable from sowing through to March (Figure 1). Experiments where straw has been incorporated into clays showed that, although most seeds eventually germinated, on average one third of the seedlings produced failed to emerge. Another third emerged but then died over winter (Figure 2 overleaf).

What causes poor establishment?

Germination can be prolonged if the seedbed is too dry, too coarse or too loose. Ploughing to bury straw in dry soils aggravates these delays by reducing seed-to-soil contact.

Even when seeds germinate seedlings may fail to emerge because seeds are sown below

Figure 1. Seedlings can fail at any stage from sowing to March

- establishment
- emergence
- germination
- sowing
- September
- October
- March
(or fall below) 3 cm depth. Aim to sow seeds 2-3 cm deep. (Figure 3). Loose and coarse seedbeds, as well as small seed, aggravate this effect.

Damage from pigeons and slugs, mats of straw on the surface, waterlogging and frost damage are the main reasons for post-emergence losses. Provided there is a fine tilth, uniform mixing of straw in the seedbed is not a problem and can reduce slug damage by providing extra food. However, mats of straw on the surface encourage pigeon grazing and lead to spindly plants which are more susceptible to frost damage.

Very high seed rates lead to small plants with thin stems which are very vulnerable over winter. Strong healthy plants withstand winter best. Avoid inadvertently sowing excessively high seed rates by determining the thousand seed weight and calibrating the drill accordingly.

The future

Although this experimental work was primarily on the influence of the seedbed, it has demonstrated that the quality of the seed can have major effects on establishment. A new ongoing project funded by HGCA, MAFF, CPB-Twyford and Germain's is examining ways of improving seed quality and thus establishment.

Figure 2. Average losses of seeds and seedlings

Figure 3. Reduction in seedling emergence with increased depth of sowing

Establishment of winter oilseed rape

Topic Sheet No. 15
Summer 1998

Action

- If cereal residues are to be incorporated, cut stubbles short, chop straw and chaff and spread evenly.
- Create a seedbed with at least one third of the soil crumbs below 5 mm diameter. This is best achieved by deepening naturally-occurring tilth from preceding crops. In very moist soils this may not be possible.
- Use heavy discs to incorporate straw and create a fine seedbed. In hard soils, use in combination with 'shallow lift' loosening.
- Plough where natural surface tilth has been destroyed by heavy rain, where land is wet, or where soil structure is damaged by wheelings.
- Roll before and after drilling to consolidate the soil, help control drilling depth, retain moisture and deter slugs.

Further Information:

Research Review: O 510
Project Reports: O 513, O 529, O 530
Ongoing project O 505/1/97

Contact: Dr David Stokes
Tel: 0115 9516052

Home-Grown Cereals Authority

Research & Development
Caledonia House
223 Pentonville Road
London N1 9NG
Tel: 0171 520 3945
Fax: 0171 520 3992