

Newark Monitor Farm meeting report

Meeting 12: Drainage and cultivations

Speakers: Rob Burtonshaw (Farm Services Ltd.) and Philip Wright (Wright Solutions Ltd.)

Date: 9 November 2018

Venue: Manor Farm, Kelham

cereals.ahdb.org.uk/newark



Meeting summary – key messages

- Find your existing drains and don't install a new system unless you really need to
- Keep drainage plans
- Make sure drains are well maintained
- Don't try to cut corners on backfill – it is expensive but a worthwhile investment
- Make sure backfill reaches high enough in the soil profile

Update on Newark Monitor Farm

Harvest

- Oilseed rape yields were more affected by the very wet spring than by the hot dry summer (weather data can be found on [AHDB's WeatherHub](#))
- Yields were down because the plants couldn't get going due to lack of nitrogen
- Wheat yields were also down due to a lack of tillering in spring - it wasn't possible to get the nitrogen on early enough
- Spring crops were much lower than anticipated with barley at 4 t/ha and oats just over 6 t/ha
- "Not a vintage year"

Winter linseed

This has been drilled because:

- July harvest date, earlier than oilseed rape
- Cheaper to grow than oilseed rape
- Gives opportunity for a stale seedbed

Crop details

- Sowing date first week in October
- The latest safe sowing date is around 10 October but this depends on the winter
- Winter linseed costs >£500 / ha; spring linseed is cheaper at £300 / ha
- Planning to use 80 kg/ha nitrogen; low cost which helps
- Important the crop doesn't get too big
- Fungicides in spring will have a growth regulatory effect



Field of winter linseed



Small winter linseed plants

Other points

- More advantages – so far there is a low risk of pests in winter linseed
- Linseed has a big fibrous root system – good crop for structuring the soil
- Disadvantage – lower income than oilseed rape
- The biggest risk is the loss of diquat for desiccant but swathing could be used
- It is seen as another break crop on heavy land, not a replacement for oilseed rape
- The residue can be baled or burnt

Land drainage and cultivations

Locating field drains

- All fields should have drains (“I have never seen a field that doesn’t have any drains” – Rob Burtonshaw)
- Drainage was a huge project in Victorian times and the drains are still there
- You should be able to revitalise existing schemes and get them up and running
- Dig down and find what is there already
- This is a massive cost saving (compared with installing a new scheme)
- Look after drainage plans – no point wasting money if you don’t need new drains
- Use Google Earth – they show up well

Maintenance

- This starts in ditches
- Most problems start at drain outlets and these need to be protected
- Willow roots can cause huge damage, getting in and growing along pipes in both directions
- Seal pipes to keep willow roots out



Willow roots removed from a blocked drain

Mole drains

- These are very cost effective but difficult to do
- You need a low critical depth and the soil needs to be friable on top
- Conditions often aren't suitable until spring
- Mole drainage relies on hardness
- Water getting in too soon can ruin a mole drain
- It is important to think about the slope – if it is too steep the mole drains will be washed out
- You need to get the angle right especially on an undulating slope
- Mole drains should be 2.5–5 m apart
- They should be 0.5–1 m deep but you need to know where the backfill is so you can go into it

Drainage and soil type

- You need to know your soil type
- Some fields are not suitable for moles – clay soils are suitable but moles would collapse in sand soils
- You need a reasonable heavy soil
- Other soils need subsoiling
- In clay soils you need the backfill to be higher

Backfill

- This makes up 40% of the cost of drainage
- It is very important to use backfill in clay soils
- In light soils don't use it unless you have to
- Washed gravel is best
- Round gravel is the best choice but angled is acceptable
- Gravel size should be 20–40 mm
- The smaller the size the faster water moves so you get faster drainage
- Measure the gravel depth and make sure it is in the right place
- Use recycled material only if washed – crushed concrete is fine as long as it is clean
- Don't just use anything for backfill – this is false economy



Mole drain



Backfill exposed on right

Drain longevity

- Plastic pipes go brittle if left out in the sun, otherwise plastic is fine
- The life of a drain depends how well it is put in
- If you see wet patches add more drains – some might have got crushed or roots might have got in

Drainage problem solving

- Focus: field of oilseed rape following cultivated twice with Horsch Joker
- Sowing date mid-September (re-drilled)
- The field was drained in October 1983 (cost £242/acre for 13 acres)
- Looked at as a long-term investment
- The gravel backfill goes down to 400 mm depth and the mole drains are at 500 mm
- It would be better if the gravel was higher – up to 300 mm
- The drains look good but the field lies wet
- The reason is probably the gravel needs to be closer to the surface

Cultivations and soil structure

- Natural structuring is visible as vertical cracks in the soil
- Blocks of soil between the fissures provide support – a soil like this with vertical columns and cracks will look after itself
- The cultivator (Horsch Joker) has moved small clods of soil which has kept the fissures open permanently
- When the metal goes through it lifts and causes stretching of the fissures
- Straw residue also drops down these gaps
- The fissures won't ever close back up completely
- This year, nature has done everything
- The key thing now for the soil is to grow things in it to pump the water out
- Roots will get in and break up the bigger blocks
- Autumn-sown crops are far more vigorous rooting - it is important to get the roots in when the energy (sun) is there, then they will play a huge role
- Also important – minimise tyre pressures and keep to controlled areas



Vertical columns created by cracks



Soil breaks away in blocks

Comments on direct drilling

- For direct drilling the soil needs to be well drained
- Questions to ask:
 - Is the drainage right? If so, you have a good start; if not you are always on the back foot
 - Is the soil type appropriate?
- Get the soil structure right first
- In good conditions take advantage

Find out more – Links to AHDB information sheets or research

[Field drainage guide](#)

[GREATsoils](#)

[Soil biology and soil health partnership](#)

[Cover crops, drainage and targeted cultivation for improved soil structure](#)

[Soil assessment methods](#)



Next meeting

Date: 14 December 2018

Topic: Foliar nutrition and micronutrients

Time: 9.00

Location: South Muskham Village Hall, Newark NG23 6EE

For more information or to find out more about Farmbench, AHDB's benchmarking tool, contact: Judith Stafford

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