

Mole drainage and soil loosening

Strategic Farm Week 2020 Webinar

Philip Wright, Brian Barker, David Lord, Harry Henderson and Teresa Meadows

Housekeeping



REC 



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Strategic Farm Week 2020

ahdb.org.uk/sfweek2020

BASIS/NRoSO Points



2 Points

Name; BASIS Account No; Postcode



Name; NRoSO Member No; Date of Birth;
Postcode

Format



19:15 – 19:50

Philip Wright
Wright Resolutions

Mole drainage and soil loosening

In
discussion
with....



Brian Barker



David Lord



Harry Henderson



Your host...

Teresa Meadows
*Knowledge Exchange
Manager (East Anglia)*



19:50 – 20:20

Questions from the floor and discussion



Session objective



Practical best practice and considerations for mole drainage and soil loosening this autumn.

Q: What would you like to know by the end of this session?

Poll

What do you consider the most important management area for field drainage?

- Shallow compaction management
- Deeper pan management
- Cover cropping
- Ditch maintenance
- Mole drainage

What is your predominant current tillage practice?

- Ploughing
- Deep non-inversion
- Shallow non-inversion
- Direct drilling

Where have you found current constraints in soil structure?

- Mostly shallow
- Mostly deep
- I haven't found any
- I haven't looked yet...



Brian Barker
EJ Barker & Sons

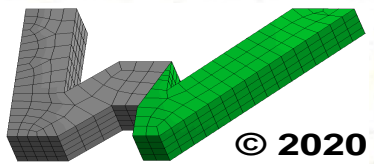
Mole drainage masterclass

Philip Wright

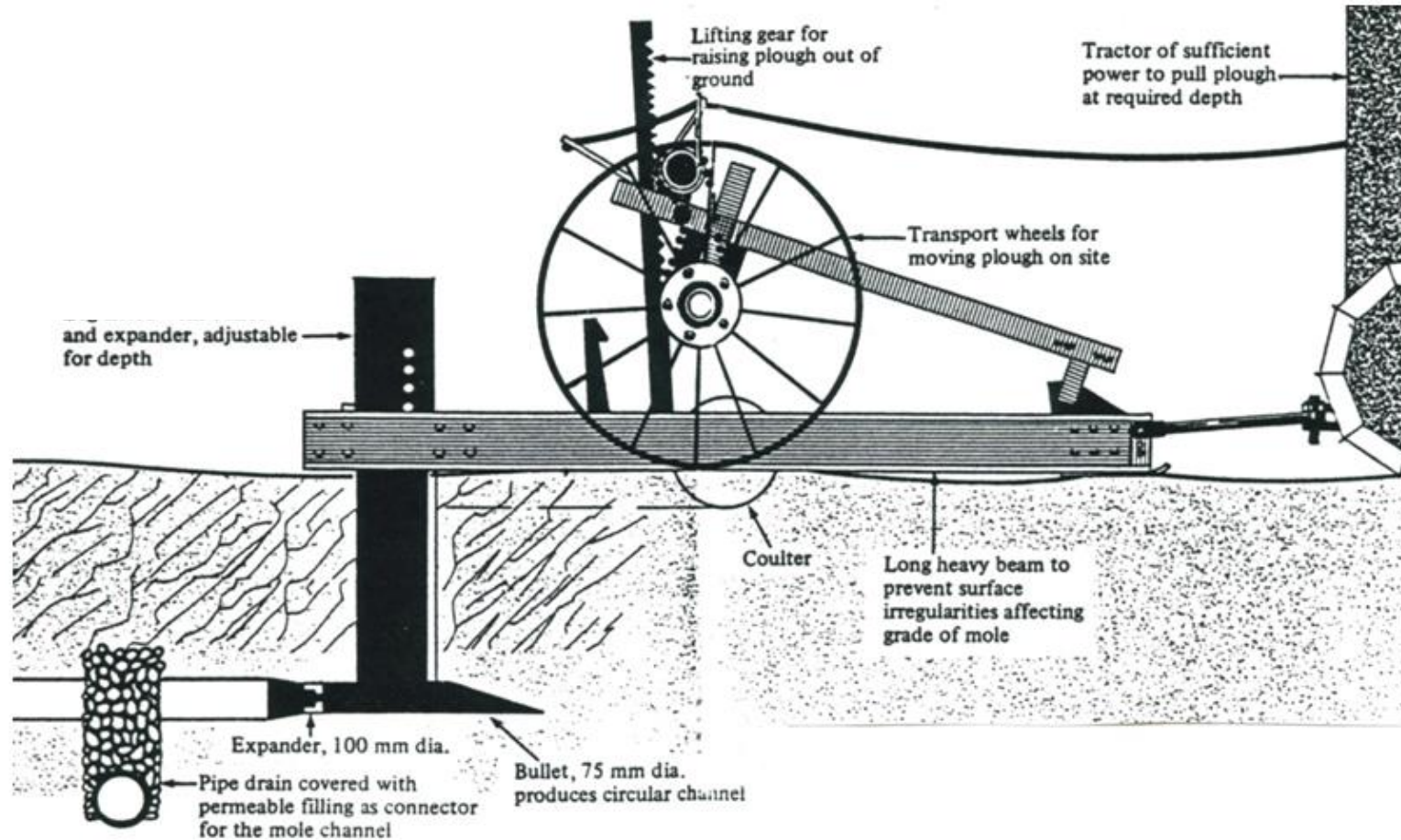
Drainage: a key cornerstone for effective farming.

Mole drainage: its role as part of the system

- Causes of poor drainage:
- Where is the problem?
 - Ground water – ditches, drains
 - Surface water – pans
 - Identify the cause.



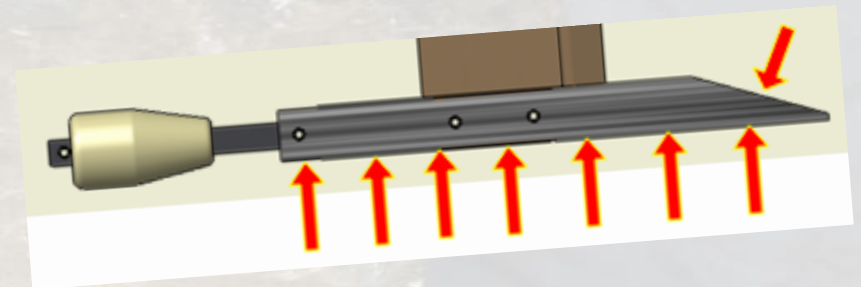
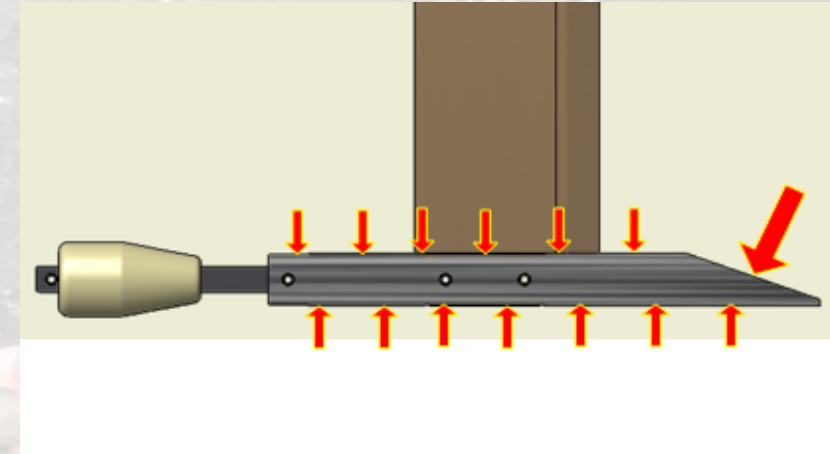
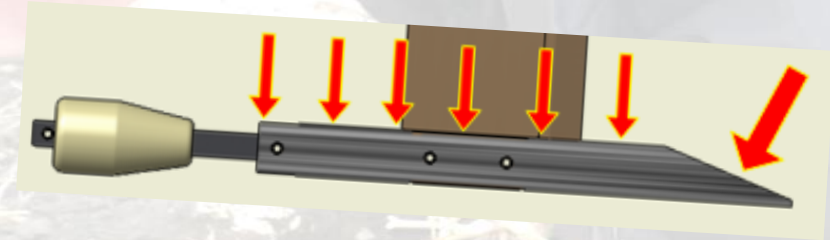
Drainage: Mole Ploughing Fundamentals.



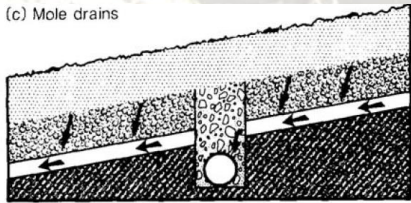
(Source: ADAS Leaflet 731 - Mole Drainage)

Mechanics: forming a stable channel & maintaining grade;
Back-fill – the path between moles and main drains
Back-fill – the interceptor for sub-surface flow.

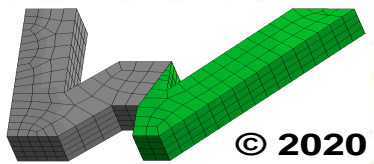
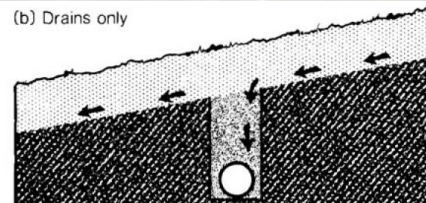
Drainage: Mole Ploughing Fundamentals.



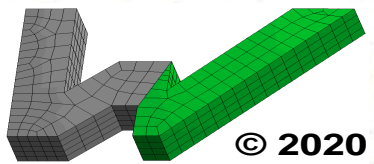
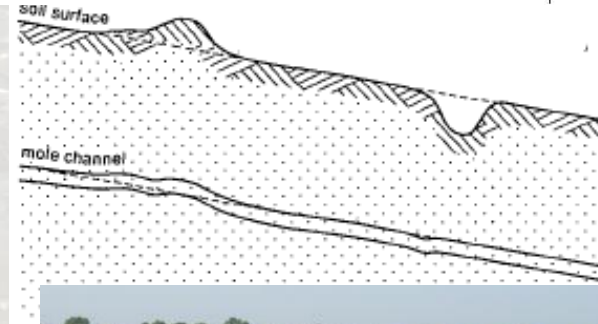
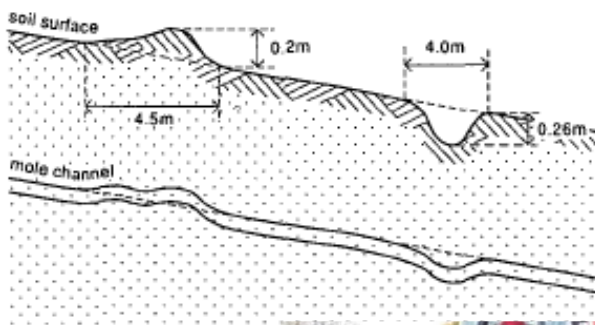
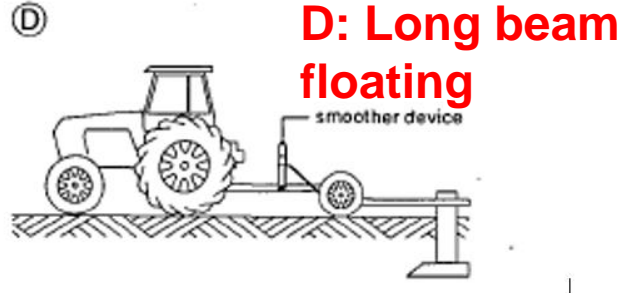
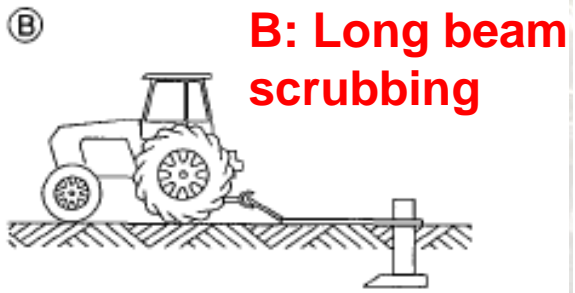
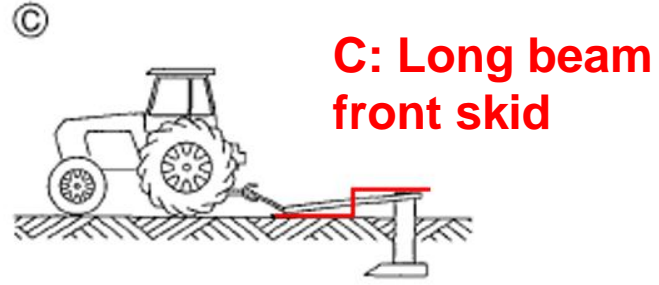
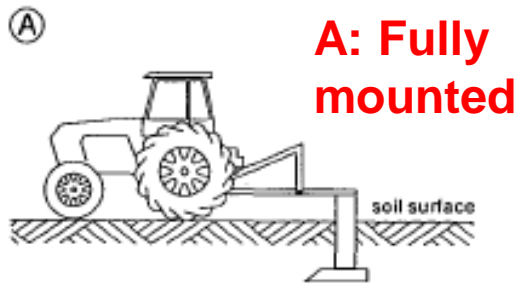
(c) Mole drains



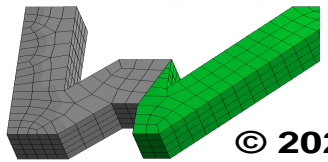
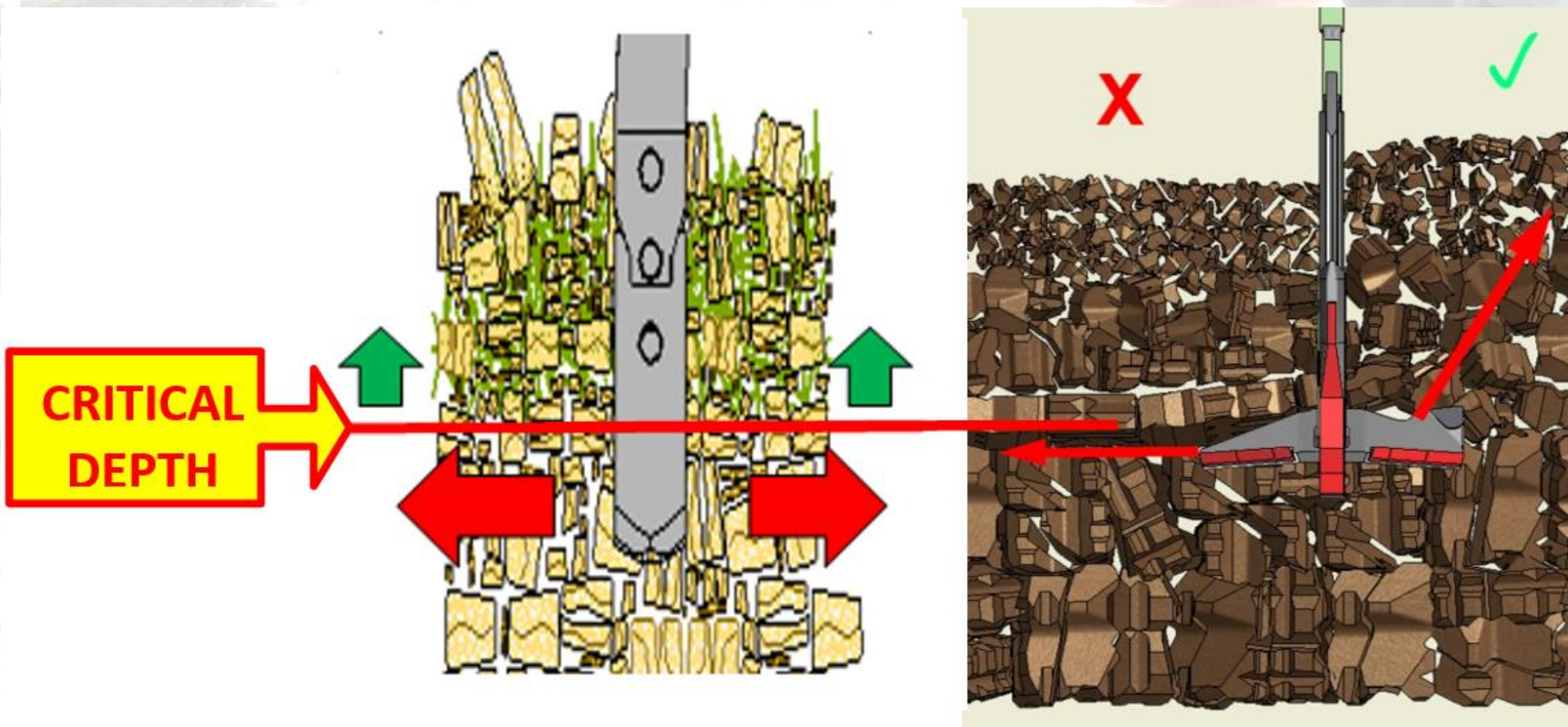
(b) Drains only



Mole Drainer Types



Mole Ploughing: Critical Depth & Lateral Failure



Mole Ploughing: soils & conditions

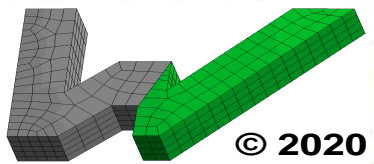
Subsoil to be >30% clay & <30% sand, calcareous or non-calcareous;
Soil & ground conditions – soil texture consistency, moisture;
Pull on an upward grade: ideally $\pm 1\%$



5-10 year life expectancy



Plastic at depth
Drier near surface



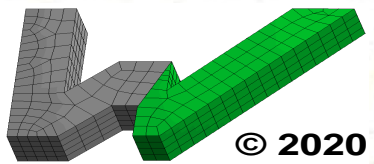
Mole Ploughing: Residues

Trailing beam operation – adequate surcharge allows residue clearance



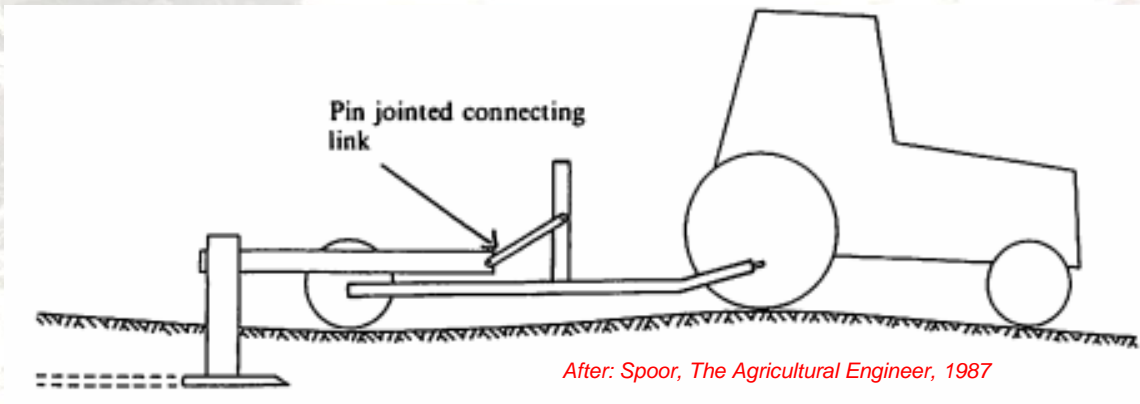
Alternatives:

- Coulter or knife
- Deflector ahead
- Long drawbar pin.....

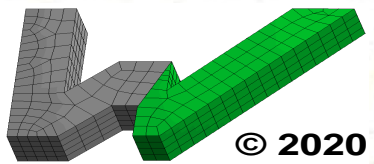
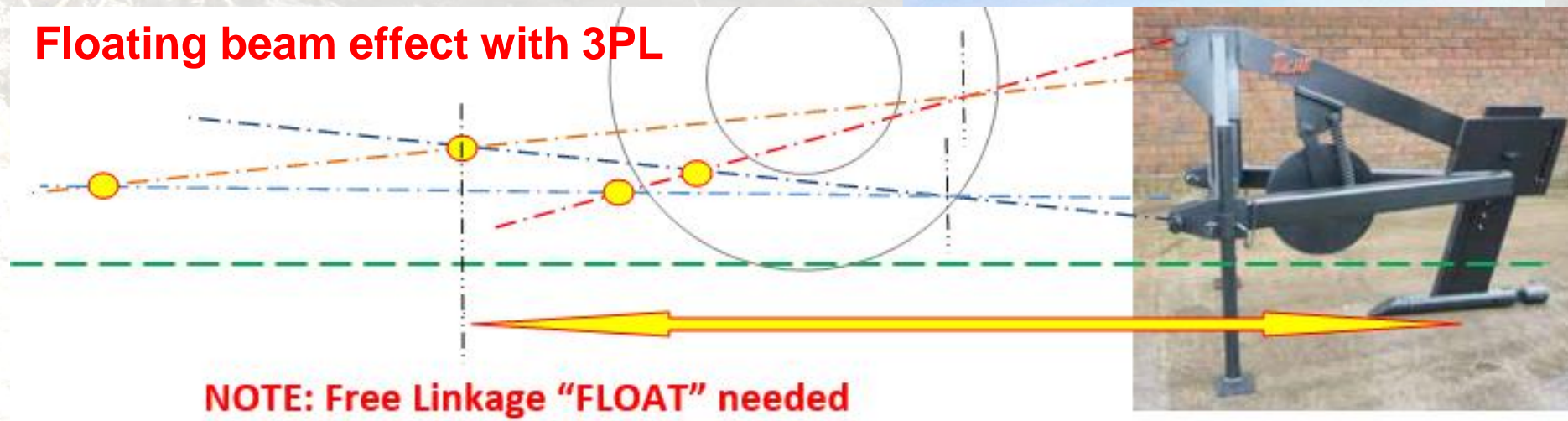


Mole Ploughing: Grade Control

Floating beam operation – hitch height control to manage gradient



Floating beam effect with 3PL



Mole Ploughing: attention to detail



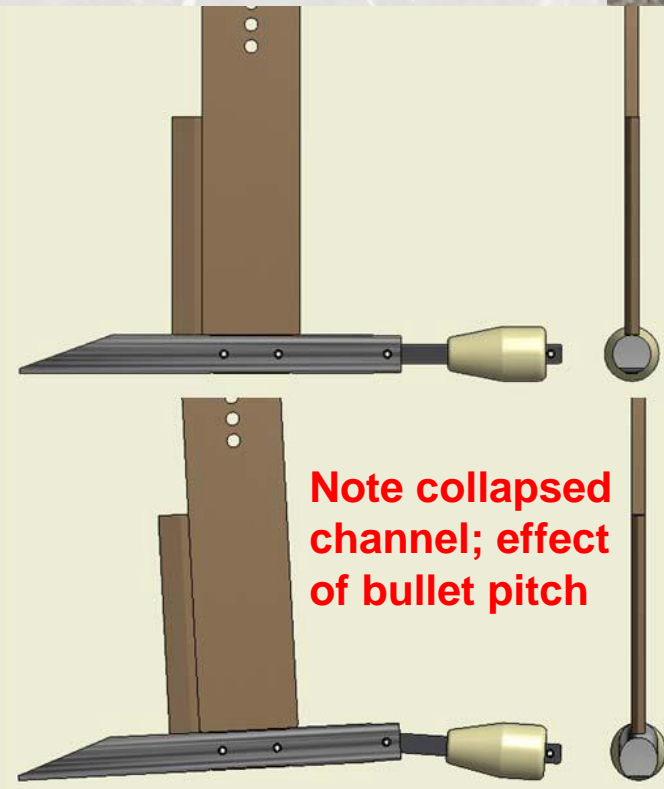
Expander Ø: Depth

Ratio >1:6

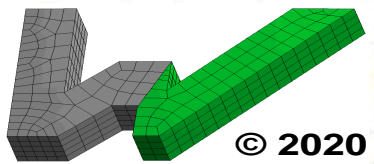
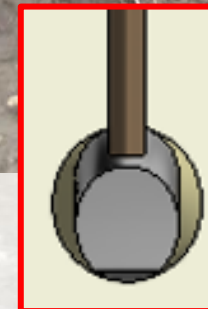
Ø80mm = 480mm mole
depth – *CD related*;

Bullet:Expander ratio

1.1 (dry/collapse prone)
to 1.35(wet/unconfined)

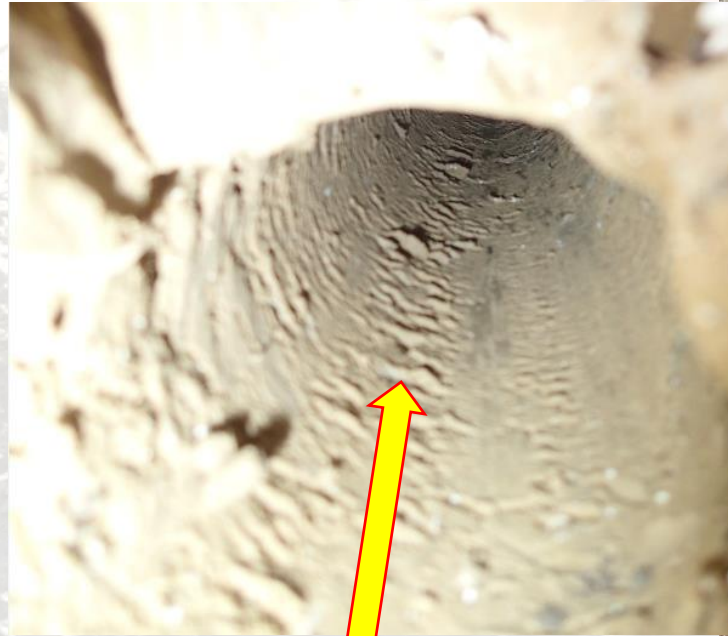


**Note collapsed
channel; effect
of bullet pitch**

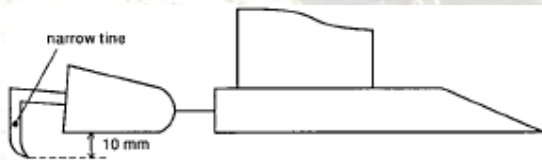


Channel stability: attention to detail

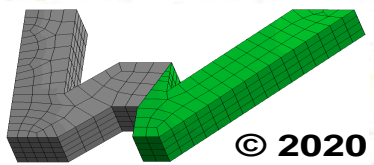
Time for mole to “cure”; correct moisture



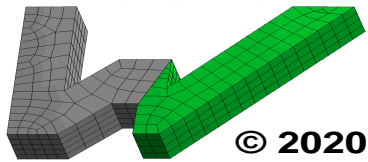
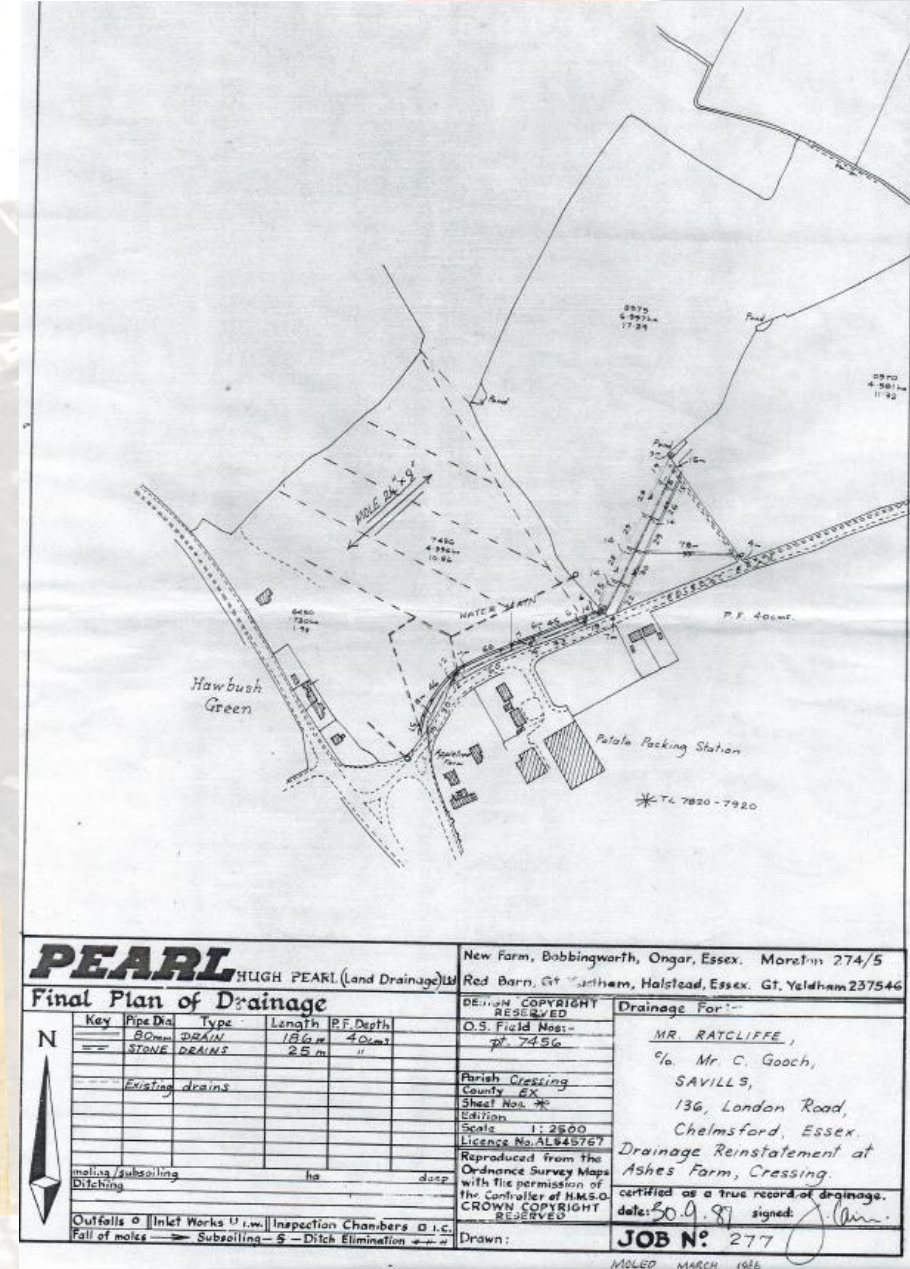
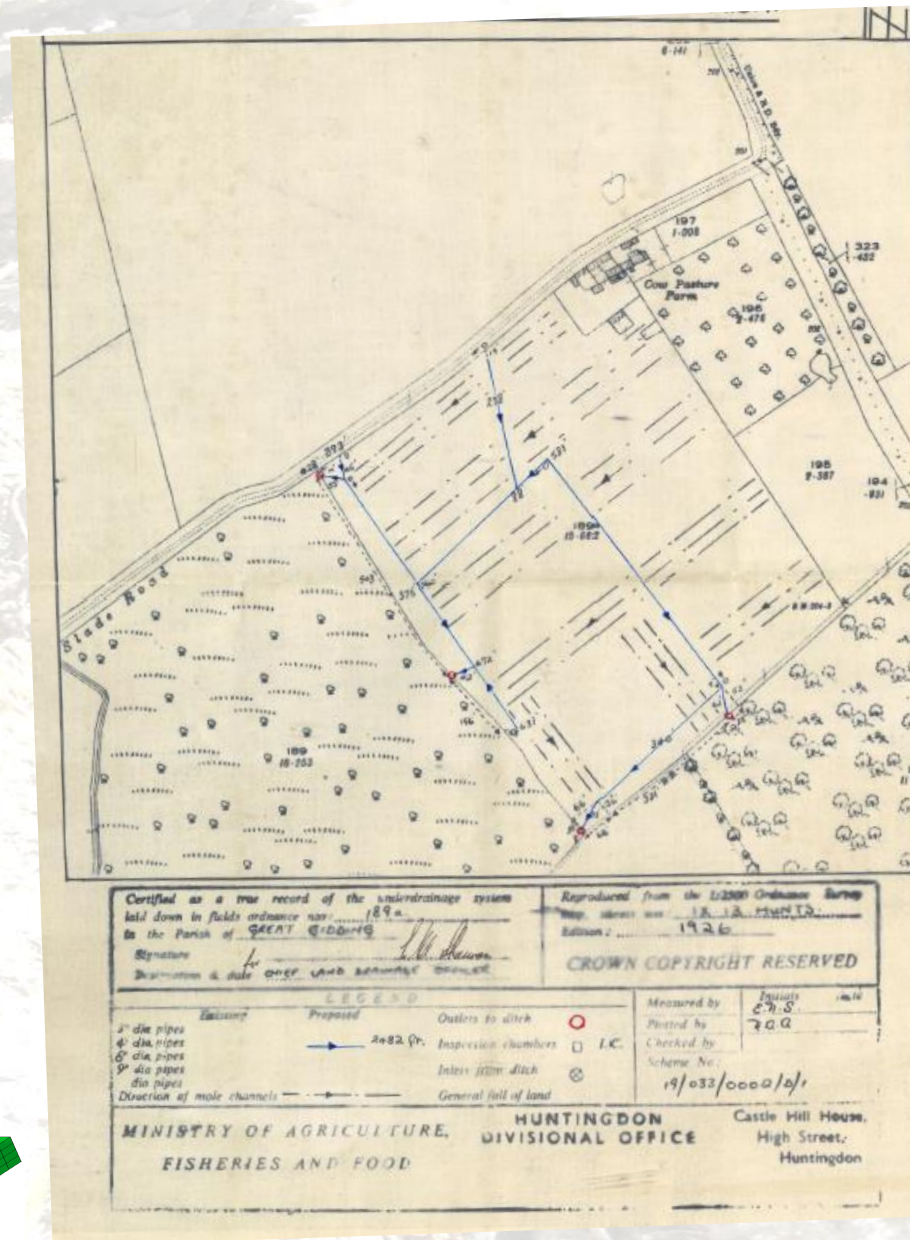
Fissures



Disrupter for soil in backfill



Mole Ploughing – Drainage Maps



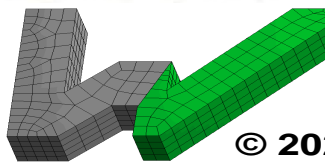
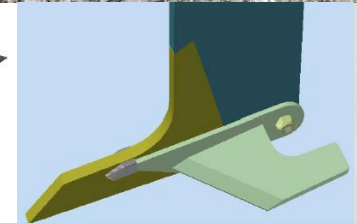
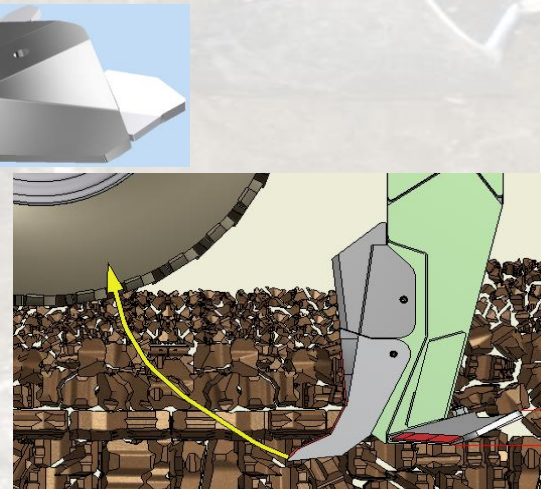
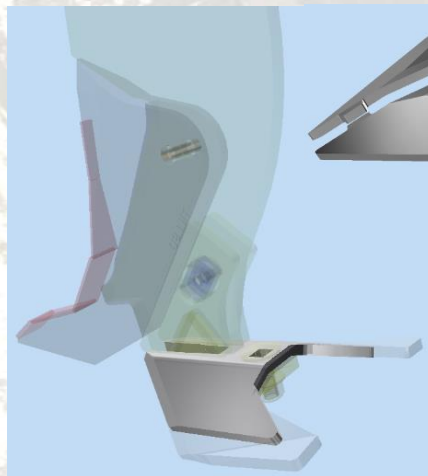
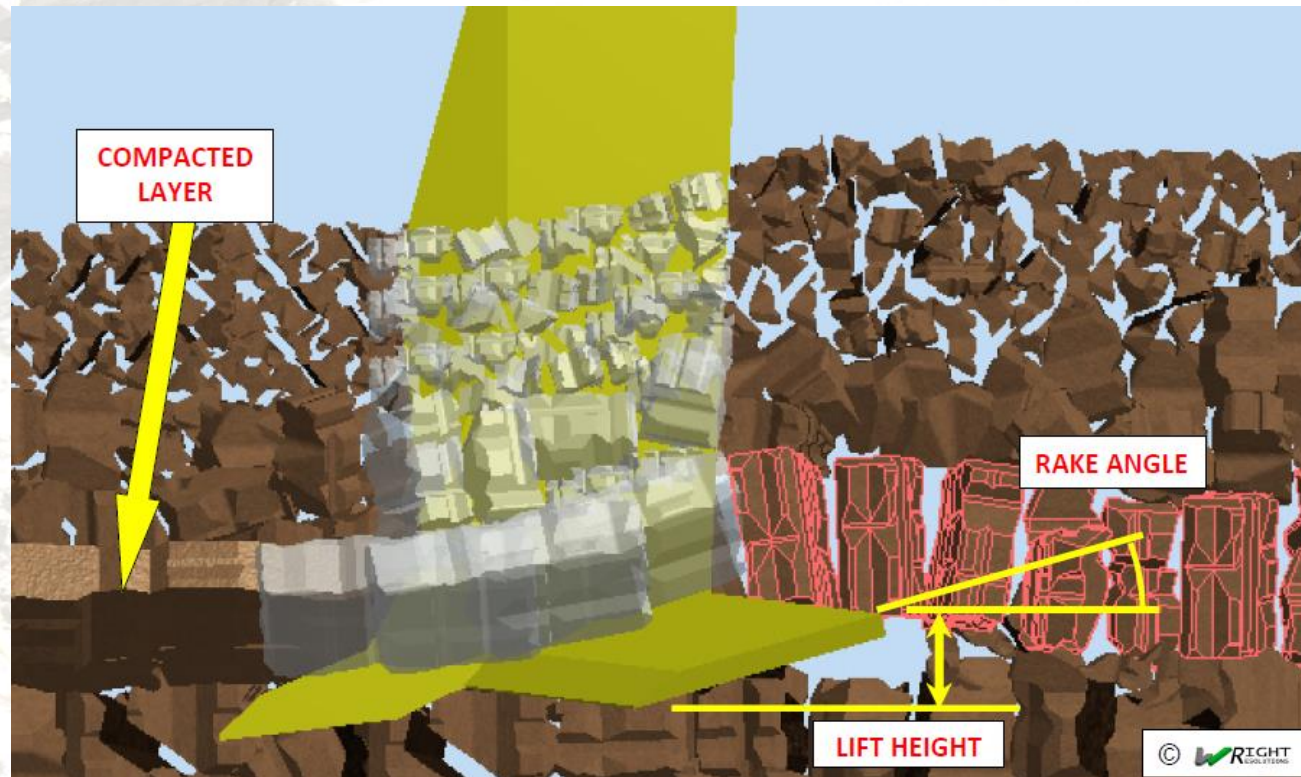


Questions and Discussion

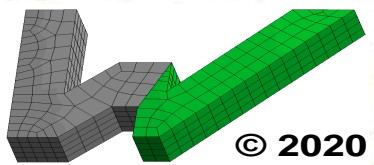
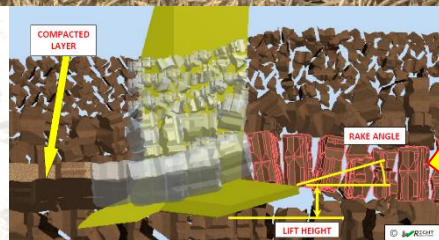
Soil loosening

Philip Wright

Sustainable soil restructuring



Tine & Shallow Tillage – enhancing natural actions



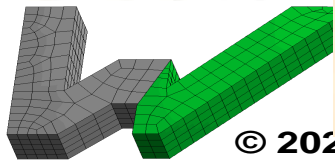
Tine & Shallow Tillage – enhancing natural actions



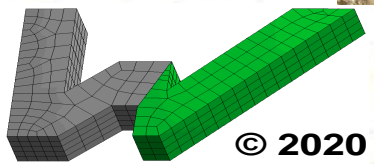
Barley post covers & metal



Barley post covers no metal



Effective Tine Loosening





Questions and Discussion



Resources

- AHDB Field Drainage Guide
- AHDB Arable Soil Management Guide
- AHDB Principles of Soil Management
- AHDB GREATSOILS website



Strategic Farm Week 2020



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All at: ahdb.org.uk/sfweek2020

Coming up...

- Regional Monitor Farm webinars
- Recommended List webinars
- AHDB Cereals monthly webinar

Info and register at: ahdb.org.uk/events

Thank you



REC ●



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