

# Soil: a Producer's Perspective

*Soil at the heart of our  
Business*

*Paul Smith  
Loddington Farm Ltd  
Maidstone  
Kent*



# Our business

- Family business
- 80 Hectares of top fruit
  - 90% Apples
- Conventional Model



- Not all are sweet!



● The remaining 10%:



# The Ashridge Trees Guide to Fruit Tree Rootstocks



**Dwarfing**  
 Fruit Rootstock  
 Apple M9  
 Cherry Gisela 5  
 Pear Quince C

**Semi Dwarf**  
 Fruit Rootstock  
 Apple M26  
 Plum/Gage/  
 Damson Pixy

**Semi Vigorous**  
 Fruit Rootstock  
 Apple MM106  
 Cherry Colt  
 Pear Quince A  
 Plum/Gage/  
 Damson St Julien A

**Vigorous**  
 Fruit Rootstock  
 Apple M25  
 Cherry F.12.1  
 Pear Pyrus communis  
 Plum/Gage/  
 Damson Brompton

# Challenges of Dwarf trees

- Higher capital costs circa £30,000/ha
- Less resilient to environmental stress
  - More vulnerable to chronic (canker) and acute (Powdery Mildew) diseases
- The higher density and closer spacing of trees concentrates and exacerbates compaction
- Soil health is critical in achieving a healthy & productive orchard

# Disease pressure



# Compaction





# Benefits of dwarf trees

- Controlled vegetative growth
- Better quality fruit – much more consistent
- Commercial cropping volumes achieved in half the time of a traditional orchard
- Simpler care required: pruning costs etc reduced by up to 75%
- Picking the crop is much easier
- Less wastage – more of the crop is saleable as class one

Some systems remain less intensive...



# Integrated Pest Management

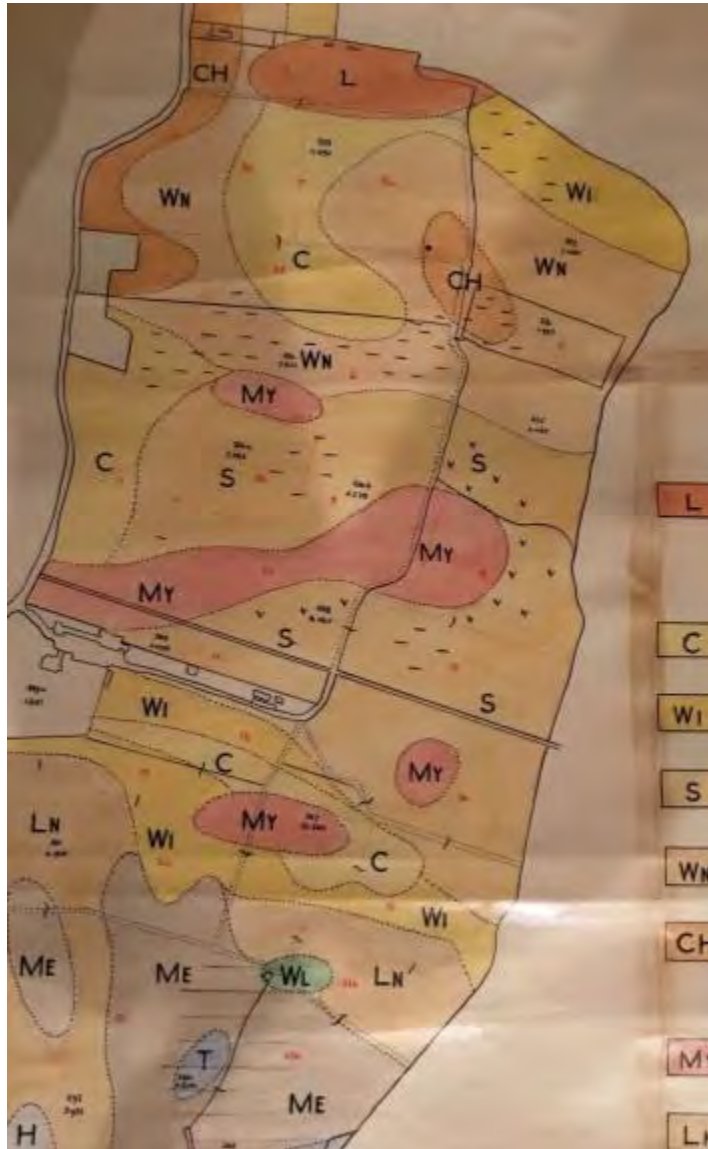


# Natural predators...



# On farm assessments

- Soil mapping
- Spade
  - Soil profiles
  - Using your hands, eyes and nose!
- Plant vitality
  - Disease expression
  - Extent of vegetative growth
  - Productivity
- Tri annual soil analysis



## Soil Maps: History and methodology

- Completed in 1970s
- They summarise various individual maps that had been drawn for each field in the 50s and 60s.
- Auger samples taken 0-6" and 6-12" depth:
- Crop advice explained in accompanying booklets.

BRICKEARTH SOIL:

Deep, warm-brown coloured medium loam top-soil, passing into heavy loam (silt loam) to silty clay loam subsoil; with pieces of ragstone throughout the profile.

L

LANGLEY SERIES

Predominantly well drained.

HYTHE BEDS (RAGSTONE) SOILS:

a. Sedentary Soils. i.e. those formed in situ from the ragstone.

C

CHART SERIES

Predominantly fine sandy loam material over solid ragstone within 18 inches of the surface  
Well drained.

W1

WIERTON SERIES

Shallow, fine sandy loam top-soil, overlying several feet of only slightly weathered hassock material.  
Well drained.

GUYTON SERIES

Deep, fine sandy loam top-soil



## West Pike Fish Farm Soil Map

- Low weald
- Predominantly weald clay, river gravel, and alluvial soils
- Famously bad for growing anything commercially





## Soil profile Weald Clay

- Very heavy
- Poor natural drainage
- Smears as soon as you look at it
- Poor aeration
- Can I have a different farm please?

## Soil profile Weald clay continued

Incorporating Organic matter as much as possible is vital.

- PAS 100 Compost
- Pulverising prunings
- Grass mowing
- Leaf litter

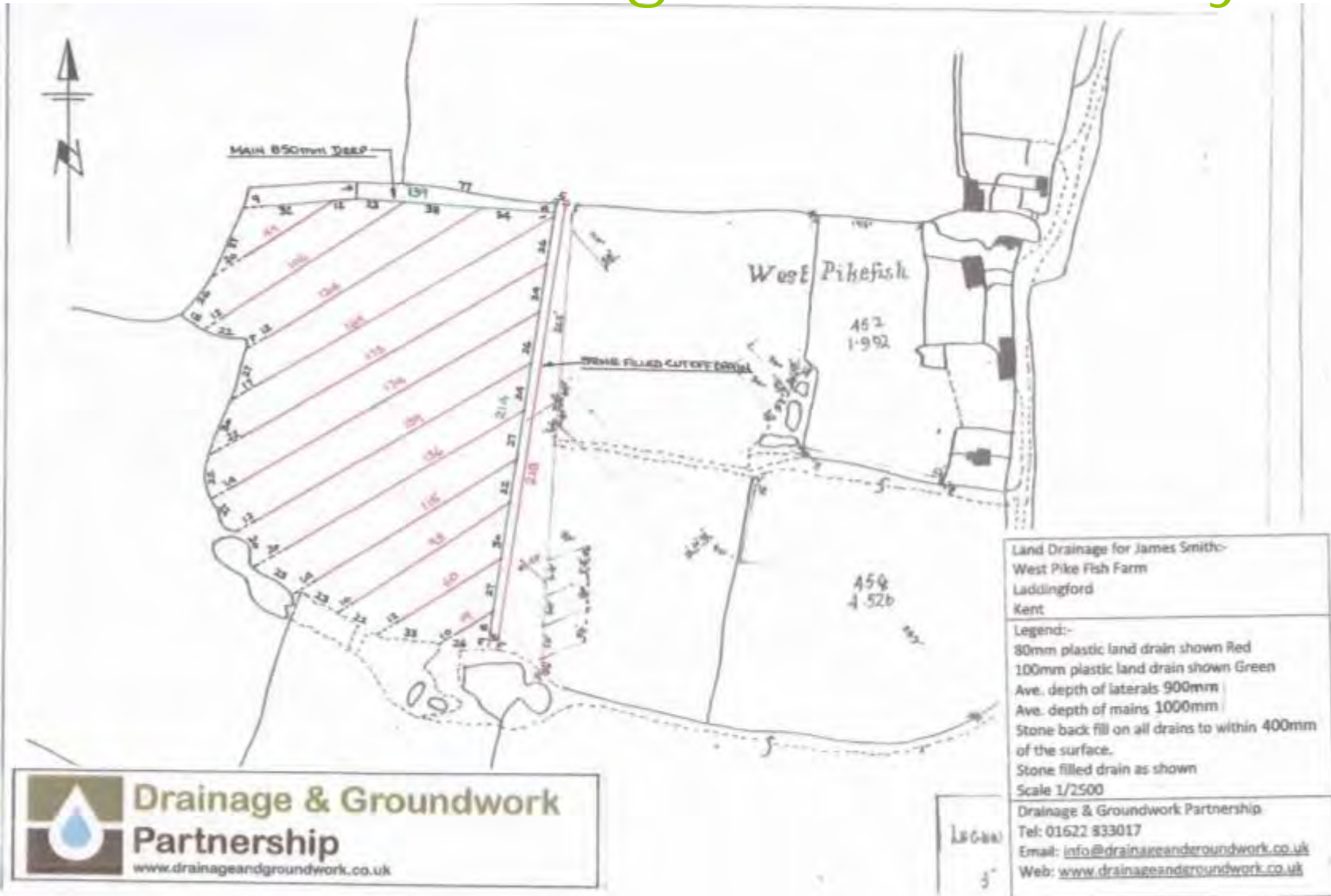




## Effects of heavy waterlogged soil

- The plant is like the canary in the mine
- Poor extension growth
- Apical fruit bud
- Ultimately moribund
- Poor yields and poor quality fruit

# Land Drainage of weald clay







## Soil Profile – Linton Series

- Deep, greyish brown, fine sandy loam topsoil.
- Fine sandy clay loam subsoil
- Overlying Atherfield or Weald clay
- Predominantly well drained



## Linton Series continued

- Good crumb
- Well drained
- Rich brown in colour
- Where I prefer farming!

# Effects of compaction in wheelings – Linton Series





# Light relief from soil profiles...





## Woodland Soil

- Mixed coppice woodland
- Great Structure
- Masses of organic matter
- Smells delicious
- No waterlogging
- I will include it in our next round of soil sampling and analysis!

# Woodland soil...



# On Farm Assessments...

- **Tri-annual soil sampling:** we have soil assessments carried out for every orchard on the farm
- This looks at the levels of a suite of nutrients, and pH
- More recently we have included an assessment of the Organic matter content of the soil.

# Information from soil surveys

Sample Ref NO11  
 Sample No E160351/02  
 Crop PEARS (ESTABLISHED)

Date Received 06/05/2015

Analysis	Result	Guideline	Interpretation	Comments
pH	7.3	6.0	Normal	Adequate level.
Potassium (ppm)	407	241	High	(Index 4.0) Possible interference on availability of Magnesium.
Phosphorus (ppm)	52	26	Normal	(Index 4.2) Adequate level.
Sulphur (ppm)	4	10	Very Low	Low priority on this crop. Other crops may be affected.
Copper (ppm)	46.3	4.1	High	Possible interference with the availability of Manganese.
<u>Boron (ppm)</u>	1.39	2.10	Low	2 x 1 l/ha BORTRAC 150. Timings: see product label.
<u>Manganese (ppm)</u>	146	85	Normal	Adequate level.
<u>Magnesium (ppm)</u>	83	120	Low	(Index 2.6) 2 x 4 l/ha MAGFLO 300. Timings: see product label.
Organic Matter (%)	3.3	3.0	Normal	Adequate level.

## Additional Comments

Irrespective of the analytical results applications of YaraVita Stopit and YaraVita Seniphos at 10 l/ha during the season could give benefits for fruit firmness, quality and storeability. For details contact your distributor or phone 01759 302545. ALWAYS REFER TO THE PRODUCT LABEL FOR SPECIFIC ADVICE ON RATES AND TIMINGS BEFORE USING A YARA PRODUCT.

# Looking forward...

- Ideas for now and the future:
  - Get closer to the soil we find in our woodlands
  - Investigate different ideas (for conventional growers!) of producing the crop
  - Agroforestry: a return to larger trees that, with the right soil, are better able to withstand chronic diseases such as canker?

# What we will be doing that we aren't already

- Infiltration rates
- Using cover crops to improve drainage
  - Fodder radish
  - Chicory
- Undersowing perennial crops to avoid creating a herbicide strip
- Earth worm counts
- Treading ever more lightly as we farm
- Moving toward regenerative agriculture

# The next generation?







Thank you and questions...