



Investigating strip tillage using Cranfield's Soil Bin

Introduction:

- Tillage affects the biological, chemical and physical properties of soil
- Changes to tillage practice could improve these soil properties
- Strip tillage only affects some of the soil
- Cranfield's Soil Bin was used to investigate the pattern of soil disturbance in a controlled environment for a range of strip tillage implements

Methods:

- Experiments were carried out using Cranfield's Soil Bin in which consistent soil profiles were created
- Three types of implement were investigated: tines with a specialist strip tillage implement, a high disturbance subsoiler (HDS) and a low disturbance subsoiler (LDS)
- Implements were pulled through the soil at a depth of 150mm
- Cross sections of disturbed soil were scanned using a laser scanner to quantify above and below ground disturbance



Figure 1: A field which has been subject to strip tillage by a specialist implement



Figure 2: High disturbance subsoiler following an experimental run in Cranfield's Soil Bin



Figure 3: Low disturbance subsoiler mounted in preparation for testing in Soil Bin

Results:

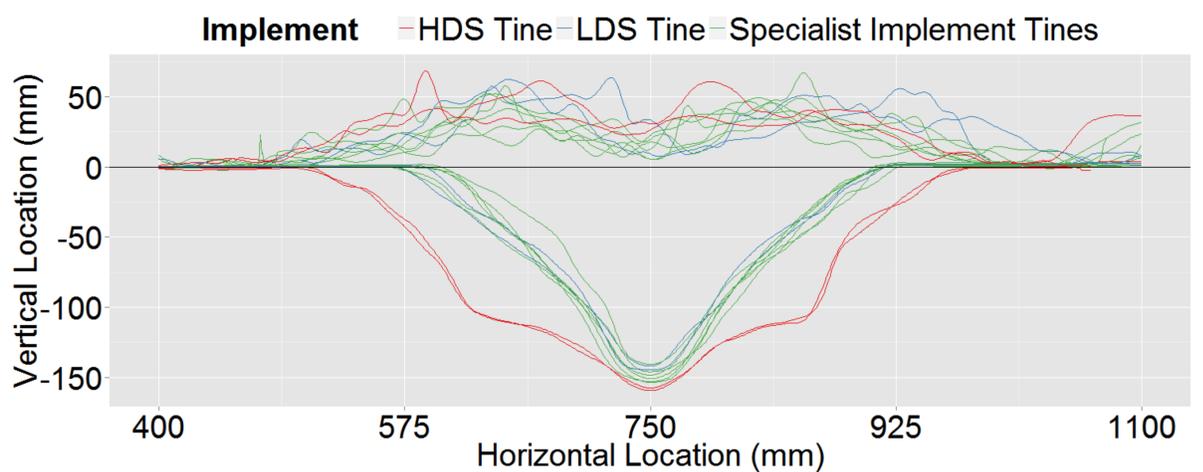


Figure 4: A cross section showing the disturbance generated by the tines investigated at a depth of 150mm. Each line represents a mean value calculated from three measurements

Table 1: Data corresponding to Figure 4 was analysed by ANOVA and Tukey HSD, different letters denote significantly different mean values at a critical p-value of 0.05

Implement	Cross sectional surface area of above ground disturbance (cm ²)	Cross sectional surface area of below ground disturbance (cm ²)	Width of below ground disturbance (mm)
Specialist implement, Narrow Tine	138 AB	116 A	293 A
Specialist implement, Medium Tine	115 A	144 A	316 A
Specialist implement, Wide Tine	118 A	151 A	311 A
LDS	185 B	103 A	328 A
HDS	168 B	238 B	409 B

Discussion:

- The LDS performed similarly to the specialist implement tines suggesting that use of these tines at the same depth in the field should be expected to produce a similar pattern of disturbance
- Further studies have investigated what these differences in soil disturbance will mean for the biological, chemical and physical dimensions of soil health

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