Optimising drilling methods in conservation tillage systems for wheat and oilseed rape production

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Introduction
The type, intensity and frequency of the tillage system is a key decision in arable systems. Sustainable agriculture requires systems which are environmentally friendly and economically competitive.

Hypothesis
Cultivation and seed placement method have significant effects on soil condition and on wheat and oilseed rape production.

Aim
To determine the agronomic, environmental and economic performance of five conservation tillage systems within a crop rotation of autumn sown wheat (Triticum aestivum) and oilseed rape (Brassica napus).

Objectives
• To evaluate the agronomic, environmental, and economic performance of the tillage systems.
• To identify how the configuration and use of conservation tillage systems can be optimised.

Method
Two experiments (one oilseed rape; one wheat) with five conservation tillage systems were established at Lamport Hall (Fig 1). The oilseed rape was planted on 5 Sept 2013, and the Vaderstad treatment was a Seed Hawk. For the wheat, the Mzuri Pro-Til 3, the Sumo DTS, and the Claydon Hybrid was used on 23 Sept, compared to 1 Oct for a Vaderstad Rapid, and 5 Oct for the current practice.

Plant count, leaf area index, and the soil dry bulk density and penetration resistance were assessed in each plot for both fields.

Results & Discussion
• Significant cultivation treatment effects on plant count and leaf area index among treatments (Fig 2 and Fig 3).
• Non-significant effect of surface bulk density and penetration resistance based on first year of measurements.

Future Research
• Determine the effects on yield during July-August 2014.
• Soil bin analysis, soil biology, soil organic carbon, plant characteristics.

Fig 1: Spatial allocation of the conservation tillage treatments in two fields in 2013-14.

Fig 2: Effect of tillage treatment on plant populations / m² of oilseed rape in April 2014

Fig 3: Effect of tillage treatment on the leaf area index of oilseed rape and wheat in April 2014

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