Strip tillage for sugar beets

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Introduction

A new cultivation technique for sugar beet growing is developed and tested in a three year project (2008-2010). The technique is based on strip tillage where soil cultivation is performed in the beet rows only. Catch crop (yellow mustard is used as model) is grown between the coming beet rows.

Aims

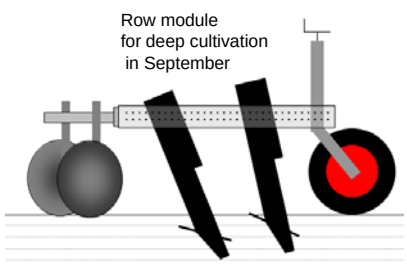
- reduce soil tillage to a minimum
- enable deep tillage in dry soil (autumn)
- integrate tillage and catch crop growing
- enable seed bed preparation early spring
- sugar yields comparable to ploughed soil

Strip tillage operations

September: Strip tillage is performed in growing catch crop

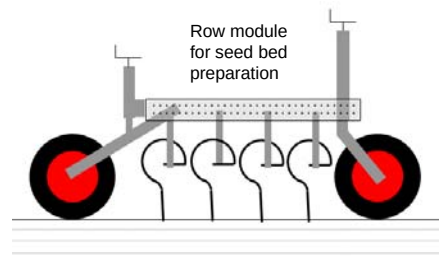
- step 1: Plants are removed in the coming beet rows to ease step 2 and control weeds
- step 2: Soil is cultivated to 10-20 cm (1-3 weeks after step 1)

Spring: Seed bed preparation



Strip tillage equipment

A unit has been constructed in order to test different combinations of tines etc. The unit consists of six row-modules which work independently due to parallel linkage to a common frame. Each module is flanked by plates to keep soil in the row (not shown). Rear discs (left) were mounted recently and not used in below mentioned trials.



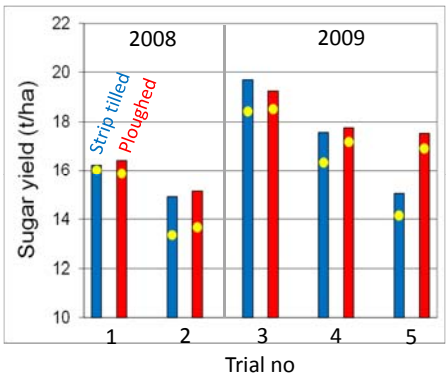


Figure 1. Sugar yields in trials comparing strip tillage and late autumn ploughing. Trials were carried out with (yellow dots) and without yellow mustard as catch crop.

Results

The strip tillage technique was compared to late autumn ploughing in 2008 (two trials) and 2009 (three trials). Currently (2010) another three trials are running. Sugar yields were at comparable levels for the two techniques in four out of five trials (Fig. 1). In the fifth trial, sugar yields were significantly lower which could be due to poorer soil loosening in the strip tillage technique (Fig. 2).

Conclusions

The tested equipment worked well in a growing catch crop and acceptable soil structure, seed bed and sugar yields were generally obtained. Further results will follow in 2010.

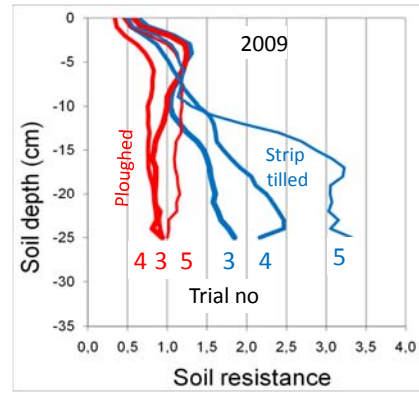


Figure 2. Soil resistance s in trials comparing strip tillage and autumn ploughing. Only data from 2009 is shown. Measurements were performed in plots with catch crops.

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