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Report

5T – Activity report 2014

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Disposition

1. Introduction / Introduktion
2. Grower concept – follow up / Odlarens betodling – uppföljning
    a. Farm data / Gårdsdata
    b. In field activities / Aktiviteter i fält
    c. Soil analysis / Markanalyser
    d. Limitations for growth / Skördebegränsande faktorer
    e. Weather data / Väderdata
    f. AY growth and yield / AY Uppnåbar tillväxt och skörd
    g. FY farmer yield and harvest losses / FY odlarskörd och spill vid upptagning
    h. Growers whole field delivery / Odlarens leverans från hela fältet
    i. PY potential yield / PY potentiell skörd
    j. Measurement of growth by NDVI / Tillväxtmätning genom reflexion
3. Grower trials for higher yield / Odlarförsök för högre skörd
4. Test och demo activities / Test och demoaktiviteter
    a. Denmark (DK)
    b. Sweden (SE)
5. Exchange between 5T growers / Utbyte mellan 5T-odlare
6. Information transfer and exchange between beet growers / Informationsöverföring och utbyte mellan betodlare
    a. ”Field” meetings / Möten i fält
    b. Beet magazines / Sukkerroenytt och Betodlaren
    c. Home page / Hemsidan

5T – Activity report 2014

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Introduction

5T ”Together To Twenty Tons 2020” was introduced as a pre project in 2013 and had its first full scale year in 2014.

This report summarizes the activities and results from 2014.

Grower concept – follow up

This part is documented in a number of excel files.

Farm data

Here you will find basic farm and farmer data, background field data such as crop rotation, liming, catch crop growing as well as machinery data.

Documented in Excel file Rawdata 1 2014 Person farm, field data + date

In field activities

Here are all activities taken place in the field after harvest of the pre crop until harvest of the beets. Information given on dates, type of activity, products, dose or rate, machinery and machinery width.

This sheet will give you all data needed to do calculations and comparisons in plant protection or fertilizer use, machinery costs as well as more over all economical calculations.

Documented in Excel file Rawdata 2 2014 Farmer activities + date

Soil analysis

The 5T area has normally the width of three passes next to each other with the sprayer. Samples are taken about 50 m from each end of the field length and one in the middle, giving three values per field. Sometimes the subsamples are put into only one before analyzing.

Documented in Excel file Rawdata 3 2014 Soil conditions + date

The first sheet gives you individual data and the next one data on farm level.

Table 1: Set up of soil analyzing on 5T farms 2014

Type	Depth, cm	Samples/field	When
N-min	0–70	3	March before fertilizing
DSI disease severity index	0–30	3	October – March
RZ Rhizomania	0–30	1	October – March
BCN Beet Cyst Nematode	0–30	3	October – March
Free living nematodes*	0–30	1	October – March
Soil nutrients and texture DK**	0–30	3	October – March
Soil nutrients and texture SE***	0–30	3	October – March
Subsoil nutrients and texture SE***	40–80	1	October – March

* 5 different types
** Rt, P, K, Mg, B, JB number, clay, silt, course sand, fine sand, organic matter
***pH, P, K, Ca, Mg, K/MG, B, clay, silt + sand, organic matter

Limitations for growth

The goal was to have a judgment after each month from April to October of factors affecting final yield. Scoring for a number of factors from 1–10 was done by the 5T contact person often together with the grower.

The scoring is not complete for all farms all months this year. During 2015 a more serious attempt is made to make it more complete.

Documented in Excel file Rawdata 6 2013-14 Limitations, grower's opinion + date.
Completed months are marked in green.

Weather data

Five Adcon weather stations were placed at or near the five 5T farms in DK.

In Sweden a logger for temperatures was placed at each 5T farm. Precipitation was in most cases measured by the farmer. Other necessary data will be collected from the nearest weather station.

Adcon weather stations of the same type as in DK were placed at the 5T farms in Sweden before 1 March 2015.

The plan is to collect and store weather data from each hour from at least March to November.

The following basic parameters will be measured:

Temperature	°C	minimum, average and maximum per day
Precipitation	mm	per day
Solar radiation	w/m^2	per day
Wind speed	m/s	average, maximum per day

AY growth and yield

AY stand for achievable yield. Six plots of 2 rows x 6 m were randomly placed in the second of the three 5T farmer yield areas. The plots should have a good plant stand and are kept free from weed and bolters.

When calculating sugar content as well as beet and sugar yields original net weights and sugar contents were used without making any corrections linked to existing inter-professional agreements.

The following parameters are included:

May	Number of drilled seeds Total number of emerged plants Number of late germinated plants
June	Total number of plants Beet weight, six smallest – all – 6 biggest Top weight Dry matter content – beet Dry matter content – top
September	Total number of plants Beet weight, six smallest – all – 6 biggest Top weight Dry matter content – beet Dry matter content – top Fanginess of the root, scoring Sugar content, Amino-N, K+Na
November	Total number of plants Beet weight, six smallest – all – 6 biggest Top weight Dry matter content – beet Dry matter content – top Sugar content, Amino-N, K+Na

Good developed beets at farm 8, near Gedser on Falster. 16 June.

Beet harvest at farm 3, Lovisero outside Trelleborg. 16 September.

Hand harvested beets from farm 5, Hviderup near Örtofta. 11 November.

Documented in Excel file Rawdata 4 2014 AY plant and yield + date. The first sheet gives you individual data and the next one data on farm level.

July Top height, color and health
Root diameter, weight and % with "black hole" in the neck
Level of weed control after different number of treatments
Soil moisture scoring

Documented in Excel file Rawdata 9 2014 Development July + date.

FY farmer yield and harvest losses

The 5T area was separated into three parts each one having the same width as the sprayer. This meant 24–36 m with a row length of 300–600 m. About 25–35 tons of beets were delivered from each part.

The beets were harvested by the farmer or his contractor in mid November and directly loaded and transported to the factory. The beets were handled and sampled as an ordinary farmer delivery with an increased sampling frequency to get reliable data for dirt tare and inner beet quality. This method had to be complemented by in field sampling in DK due to limited resources at the factory.

The size of the harvested area was carefully measured and thus beet and sugar yield per hectare could be calculated from each delivery.

A harvest loss investigation was carried out during and directly after harvest.
Root breakage, cracking and soil surface damage were calculated from samples of 2x50 beets from each delivery, in total on 300 beets per field.

Beets left in the soil or lost on the soil surface were sampled from 15–20 m long areas covering at least one full width of the harvester. In total six areas per field were investigated this way. In the end harvest losses of beets per hectare could be calculated.

Finally the 5T Farmer yield could be compared to the AY achievable yield in the hand harvested plots.

Harvest at farm 1, Gretelund. 13 November.

Scoring of root breakage and cracks at farm 4, Tofta outside Landskrona. 19 November.

Documented in Excel file Rawdata 5 2014 FY Farmer yield and harvest losses + date.
The first sheet gives you individual data and the next one data on farm level.

Grower's whole field delivery

The grower calculated the sugar yield from the whole 5T field. Please note that delivery date differ between farms. Losses due to early or very late deliveries may differ between the farms.

Again the field yield can now be compared to the FY 5T farmer yield and the AY Achivable yield.

Documented in Excel file Rawdata 10 2014 Farmer field data + date.

PY Potential yield

Is the yield potential fully explored in the 5T fields? By making use of collected weather data in a growth model from AB Sugar in UK this question will be answered.

A report is expected to be ready during summer 2015.

Measurement of growth by NDVI

The 5T fields were scored with a reflexion tool called Green seeker every fortnight throughout the season from May to October.

This part will be presented in a separate report by Otto Nielsen during summer 2015.

5T grower trials for higher yields

5T grower nr 1, Henrik Nilsson at Gretelund in SE, has tried a strip tillage concept.

In summary

- The trial gave a very high biological beet and sugar yield/ha on the level 125 ton beet/ha and 21 ton sugar/ha.
- There were no statistical differences in beet or sugar yield between the two tested cultivation systems deep cultivation to 25 cm and strip tillage down to 30–35 cm.

Documented in report 788 "Testing of HEVA strip tillage within project 5T at Gretelund 2014".

Test and demo activities

Denmark

The test and demo activities in Denmark were coordinated by DLS, NBR and Nordic Sugar as a part of the project IPMIROER. Test and demos were placed on all five farms managed by Emil Busk Andersson at DLS.

The following parts were included

1. Tolerance to Venzar and Command in different beet varieties
2. Effect of N on weed density + 0 – 20 – 40 kg N/ha
3. Lower herbicide use, -10 to minus 30 %

4. Inter row cleaning strategies
5. Five herbicide strategies
6. Spraying technology – five types of nozzles
7. Leaf disease control – effect of delayed treatment.

Documented in PowerPoint presentation by Emil Busk Andersen.

Sweden

Some demos were placed on all five farms including:

- Weed control after 0 – 1 – 2 and 3 sprayings against weeds
- Control of leaf diseases after 0 – 1 or 2 sprays

Most of the test and demo activities were concentrated to the 5T farm nr 5 at Hviderup outside Örtofta. This farm was chosen as place for the NS/NBR summer meeting in 2014.

The test and demos included the following parts:

1. Test of a new 18 row Thyregod inter row hoer with DUBEK band spraying equipment
2. Test of GPS RTK guided hoeing at three distances to the row
3. Test of market varieties and candidates for 2015
4. Trial with the new Väderstad Tempo seeder
5. Test of N fertilizers – different products – overall and in the row application
6. Trial to inspire discussion around how to promote growth and sugar yield. Included compaction, covering with peat and plastic sheets between the rows
1. Harvested and documented in NBR report 788 "The effect of soil surface changes in sugar yield – a 5T test project at Hviderup in 2014"
7. Test of different nozzles for weed control. Presentation of Lemken sprayer
8. Test of different herbicide treatments – linear application of increased doses
9. Presentation of hoeing machines from four manufacturers
10. Demonstration of the Klünder clamp covering concept.

Presentation of the machinery used in beet growing at Hviderup.

No significant countings or scorings were made. Photo from test plots and of machinery as well as trial plans are available at NBR.

Exchange between 5T growers

The basic set up is a summer meeting in each country and a meeting for all 5T growers during the winter.

We soon found out that there is a need for more frequent meeting, if possible over country borders.

The Danish growers meet in August (Prästö, Själland, CS) and the Swedish 5T growers meet in May (Hviderup, JM) and June (Lovisero, GO and Tofta, MR).

A joint trip to “Beet Europe” with all 5T growers together with representatives from NBR and Nordic Sugar were done in October 2014.

The winter meeting was held at Nordic Sugar in Copenhagen on 18 December.

A meeting around frost protection and clamp covering was organized at Örtofta and Hviderup on 8 February when the beets from our clamp trial 618 were delivered.

Information transfer and exchange between beet growers

”Field” meetings

The activities in DK were fairly evenly distributed among the five 5T farms. Minor meeting were hold during spring, summer and autumn at all farms.

In Sweden information transfer in the field was concentrated to the 5T farm Hviderup. All growers (about 1800) were invited to a half a day “summer field meeting” organized by Nordic Sugar and NBR. All together four meetings were hold during 10–11 June with close to 600 visitors.

Beet magazines

Articles about the 5T project were published in issue 3–4 of Sukkerroenyt in DK and issue 2–4 of Betodlaren in SE.

Home page

A special home page was set up by Nordic Sugar in April 2014. It can be found at www.projekt5T.nu. The 5T homepage is also easy accessible via www.sukkerroer.nu or www.sockerbetor.nu.

Borgeby, 15 June 2015

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Project Manager 5T