



Controlled Traffic Farming (CTF) Working Group

Report of CTF working group meeting at ISTRO 2006 conference in Kiel, Germany, August/September

Who was there?

Twenty six people attended the meeting from nine different countries. We convened the meeting at 7.30 pm on Monday 28th August 2006 and finished around 10 pm. See Appendix for list of attendees.

What did we do?

We started with presentations from Hans Henrik Pedersen on satellite guidance systems, followed by Bert Vermeulen on the progress they are making with CTF in the Netherlands and finally by Tim Chamen on the Colworth CTF project in the UK.

Presentations

Hans Henrik took us through the various satellite guidance options that were available, their relative merits and delivered accuracy. He mentioned the valuable research on guidance systems conducted by Henault and Brouant in France and reported in 2005. The presentation concentrated on the added value of Real Time Kinematic (RTK) DGPS, which delivers an accuracy of around ± 2 cm, but costs around Euro18,500 (US\$24,000) more than a system delivering ± 10 cm. The system involves introducing a local base station, but this can only deliver the correction signal within line of site of the field vehicle. It is possible however to introduce repeaters to extend the range. RTK works well up to a vehicle speed of around 10 km/h, but performance drops off above this. The other advantage of RTK is that it largely overcomes the problem of losing the correction signal that is normally provided by a geostationary satellite situated over the equator. The further north you are, the greater the likelihood of signal loss. In difficult circumstances, such as harvesting of root or other crops in wet conditions, RTK can make the difference between staying on and slipping off the permanent wheelways. Companies offering RTK in Europe include John Deere, AGCO, Trimble, Outback and Autofarm.

Bert updated the group on the research and experiences surrounding what are now three Dutch organic farmers working with a “seasonal controlled traffic system” (SCTF). It is seasonal because traffic during harvest and primary tillage is not on the permanent tracks. The system with Fendt tractors on a 3.15 m track and implements 6.3 m wide is guided by RTK DGPS. Liquid manure is spread by a contractor also on a 3.15 m track. Green peas, spinach, onions and carrots have been grown on a 22% clay soil using SCTF and a low ground pressure (LGP) system. Air content of the top 15 cm was improved by around 3% under the controlled traffic system. The yields of seven out of ten crops exceeded those of the LGP system and one was equal.

In terms of the engineering, the RTK system has delivered the predicted accuracy of ± 2 cm at a speed of 1 m/s, but dynamic loads on the extended front axles have caused

problems, as has the durability of the narrow rubber tracks that some farmers use. The growers have stated that they could reduce their tractor size from 140 kW to 100 kW as a result of CTF, and this should help reduce the problem of ruts on wet clay soils in the spring when tyres are used instead of tracks. Other results showed a reduction in N₂O emissions but no measurable effect of N balance in the soil, while workable days were increased, mechanical weed control was improved and there was a good potential for increasing farm profit. It was calculated that, for a 200 ha farm, a 2% increase in yield was needed to break even with the extra cost of SCTF and that anything above this would be increased profit.

Bert has subsequently reported getting further funding that will allow him to look at a complete CTF system compared with SCTF. He also has other funds for setting up an “innovation network” within the organic farming sector. At their first meeting four out of the six growers present were very much in favour of SCTF, while in December of this year, the ninth organic farmer will introduce SCTF on their farm. Interestingly, these SCTF organic farmers have offered to prepare non-trafficked strips on the fields of their non-organic neighbours to demonstrate the advantages, and in the longer term to generate greater demand for harvesting solutions. Bert considered that research and development around this subject was the priority.

With all this activity in the Netherlands, you will not be surprised that we agreed that our next CTF Working Group meeting would be hosted by Bert (more later).

Tim reported on the Colworth controlled traffic project in the UK that has been running since 2004 with commercial sponsorship from a range of industry partners. Crucial to the success of this has been the close involvement of an increasing number of farmers, all of whom have CTF on their agendas. Details of the project and results to date can be found at: <http://www.controlledtrafficfarming.com/colworth.html>

Discussion

Discussions following these presentations centred on satellite guidance, what it could and could not deliver and the level of accuracy required. Those members from Australia were convinced that RTK was the universal answer and delivered the essential level of accuracy required. It also overcame the problem of returning to exactly the same track position, a crucial need if the area trafficked was to be minimised. Calculation of the economics was likely to be helpful to determine the return on investment for what at present is an extra Euro18,500 (US\$24,000) for RTK.

There was obviously a great deal of interest in this subject and it is planned to expand the available literature and first hand experiences on the CTF website to satisfy this need.

The question of standardisation was also raised with a suggestion that there should be some sort of conformity for CTF systems that would help manufacturers design appropriate machines. In Australia a wheel track of 3 m has become the standard, but in Europe practitioners are struggling with this. Narrow roads and farm tracks plus population density make this a difficult standard to aspire to and we need to come up with alternatives. In terms of implement width, the trend is towards 8 m because this is what is available, but 9 m is also an attractive option because many harvesters have 9.14 m wide cutting platforms that satisfy the need for some extra width to gather the entire crop.

Some European harvester cutting platforms would have to be widened slightly (presently they are exactly 9 m) to comply with this.

Research

It was again stressed that CTF systems would have to become more widely adopted before significant research needs would be identified. Members of the group were encouraged to engage with farmers and growers to raise the question of what CTF could do for them. As we have seen from the Netherlands, on-farm activities are the most effective way of initiating research funding.

Presently research priorities are:

- harvesting systems for high value and root crops;
- confirmation of environmental deliverables on commercial farms;
- demonstration that no-till systems were sustainable under CTF on a wide range of soils.

Future programme

The suggested programme for the CTF working group was:

- Visit to the Netherlands in spring/summer 2007
- 2-day conference on controlled traffic in late 2007, venue to be decided
- Further visit/workshop in 2008, venue to be decided.

Attention was drawn to the fact that ISTRO offers financial support to help run workshops and visits between conferences. The total available for each working group is 1000 Euros. Groups should apply directly to the Secretary General for these funds whose purpose is described in the October 2006 ISTRO info available at:

http://www.alterra-research.nl/pls/portal30/docs/FOLDER/ISTRO/ISTRO_II/P_FRAME.HTM

Tim Chamen
December 2006

Appendix

The people who signed the attendance sheet were:

Name	Country
Christoph Bommers	Germany
Andrew Whitlock	Australia
Don Yule	Australia
Doug Karlen	USA
Phil Bolton	Australia/Germany
John Fielke	Australia
Dick Godwin	UK
Tony Vyn	USA
Heinz Josef Koch	Germany
Rupert Geischer	Germany
Robert Brandhuber	Germany
Markus Demmel	Germany
Thomas Anken	Switzerland
Lars Munkholm	Denmark
Hans Henrik Pedersen	Denmark
Koichi Shoji	Japan
Hossein Shahgoli	Australia
Anne Dain-Owens	UK
Jana Harrankova	Slovakia
Maria Kokkora	UK
Dirk Ansoerge	UK
Chris Saunders	UK/Australia
Athanasios (Thanos) P. Dedousis	UK
Bert Vermeulen	Netherlands
Jeff Tullberg	Australia
Tim Chamen	UK