

Water Sensitive Farming Project 2017
Final Report

Water Sensitive Farming

Broads Authority

TESCO

Broadland Catchment Partnership



Broadland potato farmer trialling kit to reduce run-off in spring 2017

Water Sensitive Farming is an initiative to benefit farmers and the environment by improving agricultural soil and water management throughout much of East Anglia. The aim is to keep soil, water and chemicals in the field and away from the surrounding river system, enhancing farm productivity and watercourse quality.

Project background

In 2017, as part of its commitment to source responsibly, Tesco funded a Water Sensitive Farming project in partnership with the Broads Authority, as co-host of the Broadland Catchment Partnership (BCP), working with local farmers and agronomists.

The Broads Authority is responsible for the conservation, navigation, recreation, and planning and development in the Broads National Park. The Broads is a wetland of international conservation importance and the UKs second largest lock free inland navigation system requiring continuous dredging of sediment.

The BCP involves a range of organisations working together to improve the water environment in the Broadland Rivers Catchment. The catchment is the land that feeds water into the Broads National Park and includes much of Norfolk and North Suffolk. The catchment is an important sourcing location for a range of Tesco's fresh produce, including potatoes.

In the Broadland Rivers Catchment more than half the waterbodies are affected by pollution from rural areas and all the rivers are at risk of sedimentation from agricultural run-off. Raw drinking water sometimes exceeds standards for nitrate and pesticides, resulting in the need for expensive treatment. Some internationally important protected habitats still do not meet required designated standards for various reasons, including excessive nutrients and sediment.

To help address these issues, the objectives of this project were to:

- trial on-site measures, including the use of innovative techniques, to reduce the risk of soil, water and chemical loss from agricultural land, improve water efficiency, and to help sustain farm profits from crop yields

- Increase awareness about the status and health of Broadland rivers and the Broads National Park and their benefits for people and nature

- Use the evidence from the project to encourage the agricultural community to adopt measures to reduce run-off from agricultural land that Tesco could support in other important food sourcing locations in East Anglia and beyond.

What we did

The project promoted the use of innovative farm technology to reduce run-off, raised awareness about the status and protection of waterbodies in the catchment, and linked growers with important funding sources. Other measures to benefit soil and water health e.g. land use improvements including cover crops and installation of silt traps were funded by other initiatives so were not in scope for this particular project.

The Broadland Catchment Partnership Officer, Neil Punchard, led on the delivery of this project and organised all communications, events, 1-to-1 farmer engagement and reporting, amounting to two days per week for 15 months, or 130 days in total. Andrea Kelly and Simon Hooton were involved in the overall project set up and management.

Information about the project was sent to more than 1000 landowners. Evaluation forms show that the project was well received by the farmers involved. The project worked directly with 34 farmers (farming over 11,000 hectares) and engaged more than 100 other stakeholders



Flyer sent to over 1000 landowners in the Norfolk Rivers Internal Drainage Board area

including farm advisers, academics, engineers and supply chain representatives.

A central element within this project was the Tesco funded 'BE Wonder Wheel', which was offered to potato growers on a free trial. The Broadland Catchment Partnership Officer liaised with local farmers to arrange delivery, collection and storage of the kit.

Andrea Kelly, Senior Ecologist, Broads Authority, formed a reference group with regional NFU and national Catchment Sensitive Farming representatives and a project engagement plan was produced. Using Internal Drainage Board contact details, landowners throughout Norfolk were sent a flyer to raise the profile of the project and promote the offer of free advice and kit trials. The National Farmers Union and Anglia Farmers promoted the project and circulated event invites through magazine articles and newsletters.

The Broads Authority set up a farming projects page on its website and the Tesco Responsible Sourcing Manager contacted a range of suppliers to promote the project and encourage uptake.

The project built on historic scientific evidence from Defra funded research, which has shown how a range of techniques, especially disruption of tramlines and wheelings, can be cost-effective at reducing soil, water, nutrient and chemical losses from fields.

How wheeling disruption machinery works

The machinery is towed behind a tractor and angled tines (metal blades) at the front cut through the soil to provide a pathway to take surface water to the crop roots. The back wheel shapes the soil to provide small reservoirs to hold back water whilst it moves into the slots cut by the tines to reduce surface water run-off and soil erosion from irrigation and rainfall events.

Costings

The Wonder Wheel and Creyke Wheel Track Roller cost around £9500 + VAT to purchase. It is estimated to cost up to £28 per hectare to use based on National Association of Agricultural Contractors (NAAC) 2017 costs for 100hp tractor + driver @ £35.19/hr and assuming 10 hectares per day but as little as £4.67 per hectare if only sprayer/irrigator tramlines are disrupted assuming a 24m spacing.

Savings of £8-£88 in water, soil, nutrients and plant protection products (that would otherwise have been washed away in surface run-off depending on the extremity of the erosion) have been estimated using ADAS Demonstration Test Catchments estimates of costs to farmers of erosion. There is also a reduced risk of financial fines or loss of payment due to cross-compliance failure for serious erosion events.

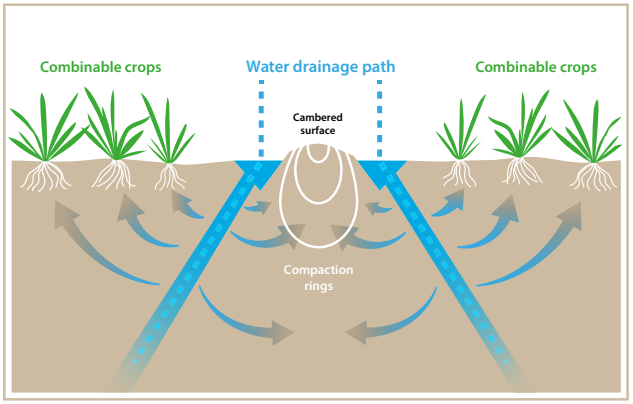




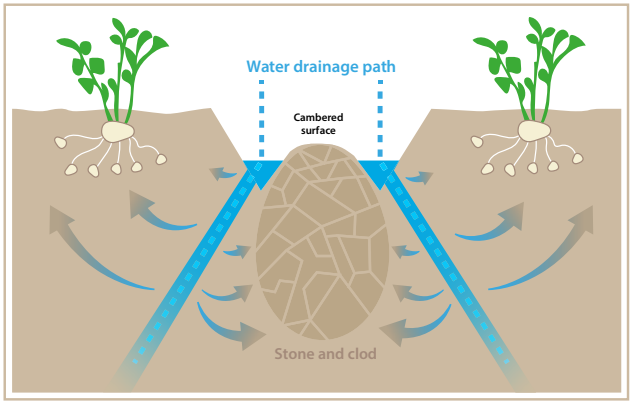
Photo: Wonder Wheel demonstration at April 2017 workshop

Events

Stakeholder events took place throughout the year to promote this project. We began with a tour for Tesco representatives and BCP partners in January to scope the project, which included visits to local sites to demonstrate interventions to protect and improve the environment.

In April we held a workshop for local producers, to discuss and hear about cost-effective solutions from Cranfield University and National Institute Agricultural Botany Cambridge University Farm (NIAB CUF). The free Wonder Wheel trials were also promoted.

In August, a presentation was given to the Tesco Supplier Network at Hougton Hall and a project and kit demonstration was organised for Tesco executives at a farm at Neatishead in the Broads. A joint farmer workshop in November encouraged tramline and wheeling disruption and promoted free kit trials.



Outcomes

Six farmers trialled the Wonder Wheel kit for free on more than 400 acres including three who are directly in the Tesco supply chain via Branston and Green Vale. A large contractor, farming over 2,000 hectares in North East Norfolk was so impressed by the performance at reducing run-off that he is likely to purchase his own kit and four of the farmers are interested in using the kit again in spring 2018.

The two farmers that are not interested in using the kit again are smaller farms that do not have much land that is sloping or that they consider to have a high run-off risk. One of these farmers was also put off using the kit again as it involved a separate pass that he did not have the time for during a busy planting period despite being made aware of the potential cost savings to his business.

A farmer was concerned that the kit may remove soil from the edges of rows - increasing the risk of potatoes being exposed to light and thus a reduction in quality from greening. The anecdotal reports from the farmers that used the kit suggest this is not likely providing the kit is used soon after, or following the planter, when the soil is moist.

One farmer reported anecdotally that potato yields may have been higher in the rows that had been disrupted using the kit and that it had 'certainly reduced erosion'. Some farmers suggested that the kit could be incorporated on to a potato planter but other farmers disagreed as they thought there was already enough that could potentially go wrong with a planting machine. One farmer suggested there may be the potential for the kit to be modified to provide liquid nutrient side dressing to the crop and he is in discussions with one of the machinery manufacturers about this.

Some farmers that were involved in the project had not engaged with environmental organisations in the past, and offering free kit trials was a useful way to work with them. Several farmers who attended events, including one farmer who trialled the kit, were already very engaged with water resource protection and the project helped to strengthen these relationships. Our engagement with one farmer has led to a potential Natural Flood Management scheme on his land. It is unlikely this would have happened without this project.

Farmers were sign-posted to funding sources such as Rural Development Programme for England (RDPE) Local Area Group (LAG) using local case studies (see: http://www.norfolklags.co.uk/case-studies/improving-sennowes-soils) where up to a 40% grant is available.

There are no reports of farmers applying for RDPE funding as a result of this project. It was disappointing to hear from a local administrator that wheeling disruption equipment could not be funded by the RDPE LAGs because Defra and the Rural Payments Agency had been advised by their agriculture team that the kit was 'part of the cultivation process and therefore not eligible' despite it being non-standard and benefitting farmers, water efficiency, the environment and rural communities.

Without interested parties being brought together at a workshop as part of this project, the expansion of scientific trials at Elveden to monitor water quality and crop yield in response to different wheeling disruption and irrigation techniques is unlikely to have happened this year.



Water running off non-disrupted wheelings in irrigated onions

Elveden 2017 trials

During the project there was close liaison with the Agricultural and Horticultural Development Board Strategic Potato Farm East trials at the Elveden Estate to share knowledge and learning.

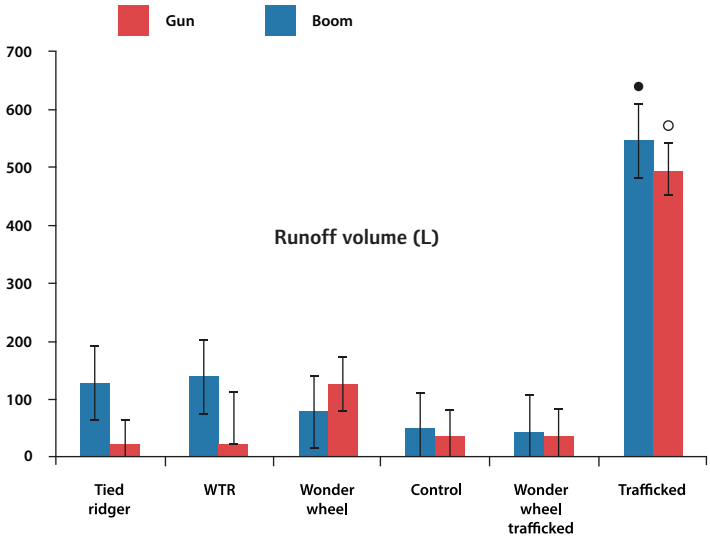
The 2017 trials evaluated the effectiveness of three different wheeling disruptors, including the Wonder Wheel, under different irrigation and rainfall events. Researchers from Cranfield University measured losses of phosphorus, nitrogen, and water and NIAB CUF recorded potato yields and crop quality.

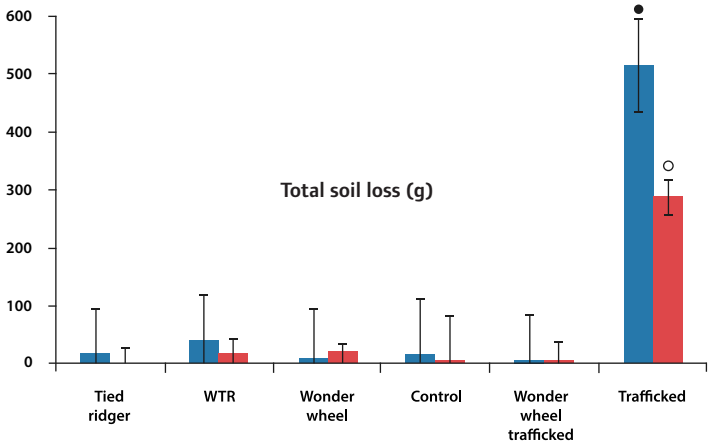
The research was paid for by the Rivers Trust and Norfolk Rivers Trust, using funding from the WWF Coca-Cola Freshwater Partnership, European Union WaterLIFE and Topsoils projects, and Anglian Water.

The trials found that disruption of wheelings ('trafficked' by crop sprayers) reduced run-off and soil loss by around 90% with significantly higher soil loss from boom irrigation compared with spray gun irrigation. There were no effects on crop yield, tuber quality or fry colour. There was an indication that rows that had been disrupted following secondary trafficking by the sprayer had a higher yield than those without disruption.

www.fwi.co.uk/arable/video-cultivating-potato-tramlines-cuts-water-soil-losses.htm

Source: Effect of tramline management and irrigation method on run-off (2017) M A Stalham, NIAB CUF.





Conclusions and future developments

The project proved extremely useful at engaging with farmers and feedback from the agricultural community was incredibly positive. The novel approach of providing kit for farmers to trial for free was an excellent way to work with farmers that previously have not worked with environmental organisations and also a good way of supporting those that are very engaged. An introduction to farmers via supply chain contacts was useful in a few instances but several of the farmers were already engaged through existing local networks.

It was difficult to get farmers to take-up 1:1 advisory visits as all are busy and can sometimes view this type of approach as interfering or not providing sufficient specialist expert knowledge to be worthwhile. Entering discussions about the protection of waterbodies was difficult but discussing potential cost-savings to the business through increased water efficiency (whilst potentially protecting downstream waterbodies) proved much more effective.

There is another type of kit - the Creyke Wheel Track Combi - that performs a similar function to the Wonder Wheel by reducing water and wind erosion in spring sown row crops including sugar beet and maize. It can also be used in autumn cereals. This kit will be available in Spring 2018, and offers an opportunity to work with sugar beet and maize growers potentially in association with the Maize Growers Association and the British Beet Research Organisation.

Recommendations to Tesco

- Continue to make Wonder Wheel kit available to vegetable producers within East Anglia as this can be co-ordinated by catchment partnerships and Water Sensitive Farming initiatives in 2018.

- Provide financial and/or in kind support to the Water Sensitive Farming initiative via catchment partnership hosts.

- Encourage the uptake of wheeling disruption in maize, sugar beet, and cereal production via supply chain contacts.

- Enter discussions with suppliers and producers to determine if vegetable and root crop production in the UK would benefit from wheeling disruption becoming a standard procedure, at least on sloping and irrigated land.

- Consider providing additional capital investment to supplier groups, or directly to producers, to encourage adoption of wheeling disrupting machinery.

Neil Punchard
Broadland Catchment Partnership Officer

Neil.punchard@broads-authority.gov.uk | 07900 266496

Yare House
62-64 Thorpe Road
Norwich NR1 1RY

Tel 01603 610734
Broads@broads-authority.gov.uk
www.broads-authority.gov.uk

Broads Authority