



Photo: 'Goliath' trial

ANNUAL REPORT 2019-20





TRUSTED



INNOVATIVE



APPROACHABLE



INDUSTRY-LEADING

Reflections on 2019 by Vicky Foster, Head of BBRO

BBRO is 'your BBRO' and everything we do is about supporting our homegrown sugar industry with first class research that is designed around you. We've put fresh eyes on our service that ensures we put our levy-payers at the heart of what we do. It's been a challenging year both for you and for the team at BBRO and we have pushed ourselves harder than ever to deliver for you. **We have processed more plant clinic samples and caught more aphids in our yellow water pan network than ever before.** The team have simply been amazing and I can't thank them enough for all their hard work in 2019!

However, we did manage to squeeze in a bit of time for ourselves to think about what's important to us as individuals and as a team. A workshop with our staff, Committee and Board members resulted in a new set of BBRO core values that we are all committed to deliver in everything we do. Behind each value; Trusted, Innovative, Approachable and Industry-Leading, is a set of behaviours which we continually look to meet and even exceed.

As well as delivering a range of events and publications for you we have also approved **10** new research projects and **3** new PhD projects in 2019 and we will bring you the results from these over the next few years as the projects progress.

Your BBRO continues to put growers first, developing a new grower portal called **BBROplus** that gives you, the levy payer, access to a range of products and services that have been tailor-built for you. We also launched a new knowledge exchange campaign called **Brilliant Basics**. We've worked hard to distil our science into its most simplest form, so you know what it is you need to do, and when, in order for your crop to achieve its true potential. I hope you enjoy reading this annual report and seeing some of the key activities we have been working on over the last 12 months.



Dr Jon Knight, Chairman of the BBRO Stakeholder Committee

I was privileged to take over the role of the Stakeholder Committee Chair from Alison Lawson in March 2019 and have a strong group of people representing, BBRO, NFU, British Sugar and specialist scientists from universities to work with. Thanks are due to Alison for her hard work in the past getting the group into shape! Since my background is in general Crop Protection and I am not a sugar beet grower I perhaps have a different take on things. I think one of the key challenges for both BBRO and growers in 2019 was the loss of the neonicotinoid seed dressing that had kept firm control of Virus Yellows through aphid control over the last 25 years. It was always going to be interesting to see how the season would pan out.

Due to the hard work of Mark Stevens and supporting team there were at least some tools available for aphid control with the Emergency Approval of Biscaya (thiacloprid) along with approved Teppeki (flonicamid). The challenge will be as great if not greater this season unless Emergency Approvals are granted again. It may well be that the problem becomes greater year on year as the virus reservoir increases and aphids become more abundant. Weather, as always, will be key in determining the severity of any outbreak. Unfortunately, the loss of actives across agriculture is likely to continue, certainly in the near future, and maybe much longer and is felt most acutely in crops such as sugar beet and horticulture. Work by BBRO along with industry on finding alternative solutions such as varietal resistance, is underway and is showing signs of promise. As if that is not enough to focus on, the BREXIT trade negotiations will get underway this summer and the future trade agreements will shape the price of both inputs and outputs.

There is of course one certainty, and that is that BBRO will be working hard to produce robust evidence to underpin the advice that goes out to growers that delivers the yields required.



Innovative approaches and tools to find solutions

BBRO works hard on behalf of the industry to find new and innovative solutions to help farmers grow a sustainable and healthy sugar beet crop. We actively engage with scientists across Europe through the International Institute of Sugar Beet Research (IIRB) but also look to other industries to see where we can bring in existing technology to our industry. Below are a few examples of innovative activities we have been working on over the past 12-months.

Boxing Beet Cyst Nematodes

Assessing varietal responses to BCN is difficult in field trials because BCN is rarely evenly distributed in the soil. Therefore, to overcome these challenges, BBRO established a micro-plot trial in 2019 to compare varietal performance with and without BCN under the same conditions.

To achieve this, 92 bottomless wooden boxes were placed on BCN-uninfested land and then some were filled with clean soil and some with BCN-infested soil. The quantity of nematode cysts were assessed to allow susceptible, tolerant and resistant varieties to be compared under different BCN pressures.

- Differences were observed in canopy size from drone imagery taken early in the season but all varieties eventually reached canopy closure
- Differences were seen in sugar content, but not all tolerant varieties responded the same
- Some tolerant varieties showed no yield reduction under BCN pressure

A shining STAR...

We have also been working on a new tool for 2020 designed to enable you to track your crop's progress throughout the season and identify where yield is being lost. These new tools will help you to better understand your crop management and achieve more of your yield. 2019 saw BBRO partner with NIAB to introduce sugar beet to the STAR (Sustainable Trial of Arable Rotations) long-term tillage trial at Otley in Suffolk. The trial on Beccles/Hanslope soil allowed BBRO to see yield responses to soil structures established over several rotations giving a real insight to farm practices and their impact.

'The impact of growing sugar beet within the rotation was assessed for the first time in 2018/19. The margin reflected yield with the highest yield and margin obtained with deep tillage.'

Visit the [BBRO website 'Opinions' page](#) for more details

A 'Goliath' Virus Yellows field trial

BBRO ran the largest field trial in Europe to investigate the response of 12 sugar beet varieties to Beet yellows virus and Beet mild yellowing virus. 8 of the 12 varieties were potentially new VY resistant varieties from major UK breeders. An innovative approach was taken using rye strips as windbreaks and blocks of brassica trap crops to limit aphid movement between plots.

Due to the sheer size of the trial (144 plots covering an entire 6Ha field) it got the nickname 'Goliath'. The plots were regularly assessed for canopy growth and development using a drone fitted with colour, multispectral and thermal cameras (see front cover photo). From this, BBRO will be determining yellowing development within the canopies of the different varieties.

The range of yield responses seen both with and without virus present was promising, indicating that there may be a range of variety choices for growers in the future. Further experiments will be conducted in 2020 to help reinforce any findings we have made in the first year.

BBROplus & benchmarking

BBRO has been exploring innovative ways of helping you to benchmark your performance and we have developed an interactive yield benchmarking tool on our new webpage [BBROplus](#).



Data are available for the last 5 years so you can see how your performance has changed over this time and link that to management practices on your farm.

Goliath facts



12 VARIETIES including 8 new



144 PLOTS across 6ha site



16,000 Sugar beet plants inoculated



200,000 virus carrying APHIDS



11 site tours including DEFRA & CRD



Forecast, Monitor, Control - A yellow water pan network to help growers manage aphids

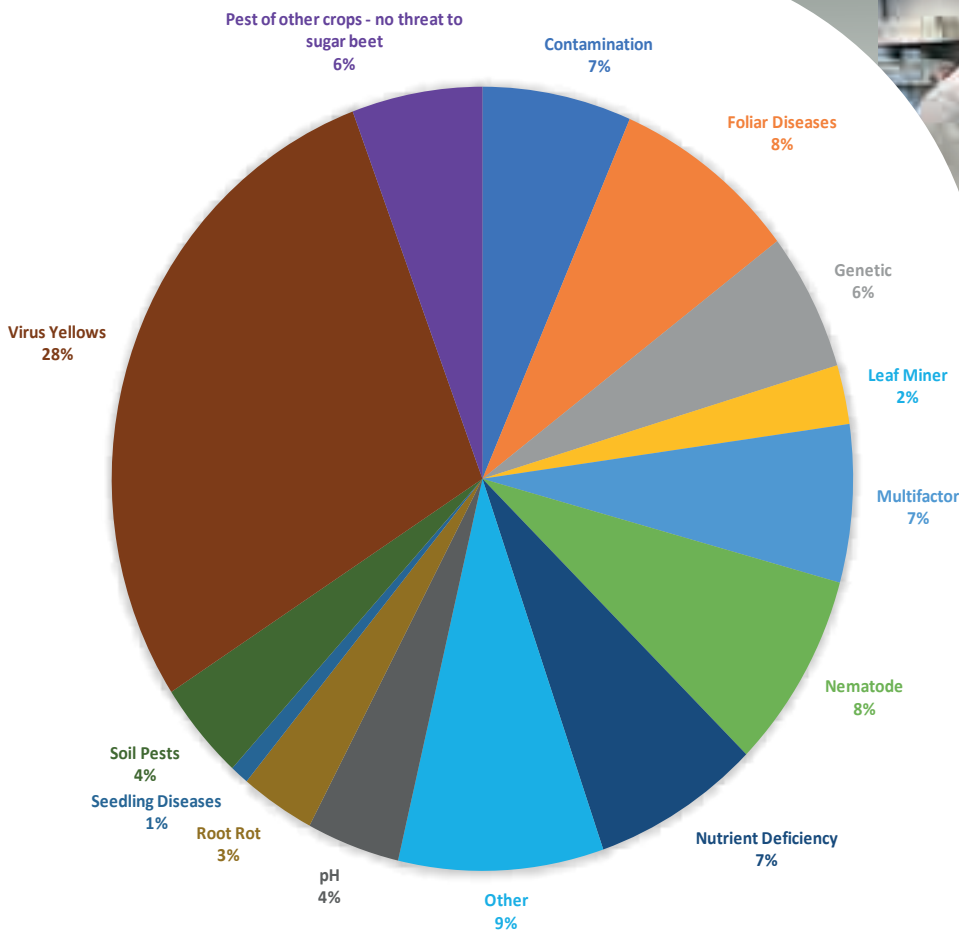
Due to the loss of neonicotinoid seed treatments, BBRO doubled its yellow water pan network in 2019 to 63 sites across the core sugar beet growing areas and caught a whopping 39,243 *Myzus persicae*. An efficient operation was run with BBRO staff working in partnership with British Sugar Contract Managers and Agronomists to collect samples from the traps twice a week and process them in the BBRO Plant Clinic.

The traps were used in conjunction with the BBRO early warning forecast run by Rothamsted Research. This informs growers on what the potential aphid levels could be based on climatic conditions. Once the threshold of **1 green wingless aphid per 4 plants** was reached growers were advised to spray their crops to protect them from aphid attack and subsequent virus infection.

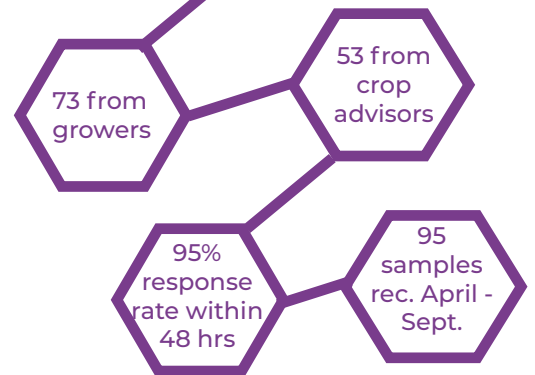


What's been in the BBRO Plant Clinic?

2019 PLANT CLINIC OUTCOMES



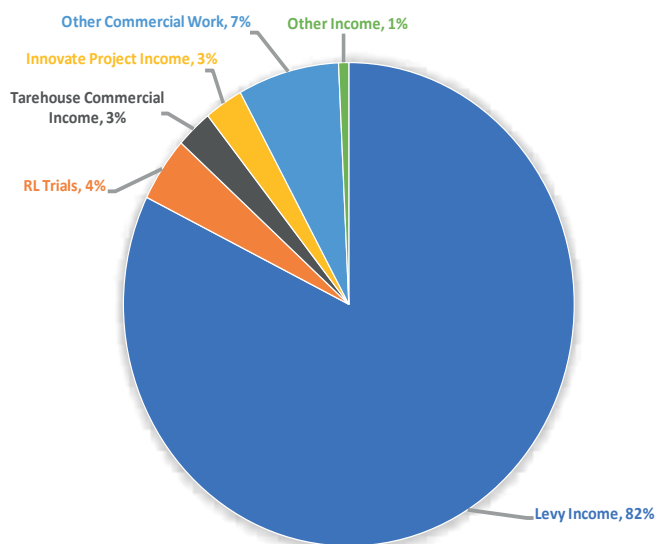
126 PLANT CLINIC SAMPLES



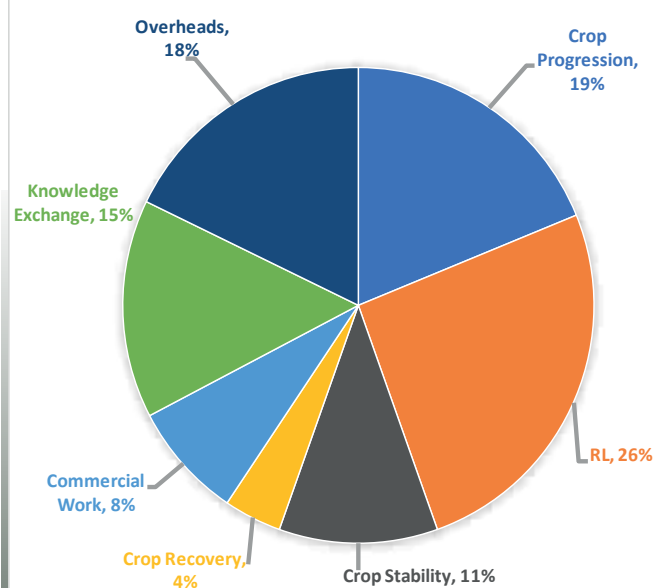
Investment summary

Income for the year ending 31st March 2020 was £2.55m. Despite the heavy autumn rainfall and slightly lower than average sugar content, the sugar beet yield was good with an average of 77 adjusted tonnes per hectare. This is in contrast to the Beet Yield Challenge average yield of 88 adjusted tonnes per hectare (= 80% of the average crops potential yield) and highlights that more of the crops true potential could be delivered. BBRO's programme of activities, including our new Brilliant Basics campaign, aims to help growers achieve more of this potential yield.

BBRO INCOME



BBRO EXPENDITURE



Team BBRO

Our BBRO team has had a few changes over the last 12 months. We are delighted that former employee Suzannah Cobb has started PhD (funded by TMAF and BBRO with industry support from KWS), at the University of East Anglia on virus yellows in sugar beet. We look forward to welcoming Suzannah back to attend our open days and technical conferences over the next 4 years, along with our other PhD students. We continuously review our staff skills and proactively support training and development to ensure we can provide the best people to support our industry. We also support a number of other student and graduate placements annually to help raise the profile of agricultural research in the UK. Staff contact details can be found on the BBRO website.



HEAD OF BBRO
DR VICKY FOSTER



HEAD OF SCIENCE
PROF MARK STEVENS



HEAD OF KNOWLEDGE
EXCHANGE
DR SIMON BOWEN



HEAD OF FIELD
OPERATIONS
DANIEL GODSMARK



HEAD OF FINANCE
& HR
MICHELLE MCKNESPIEY



KNOWLEDGE
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MANAGER
CHES BROOM



KTP ASSOCIATE
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DR TOBY TOWNSEND



KTP ASSOCIATE
CROP PROTECTION
DR ALISTAIR WRIGHT



GLASSHOUSE &
LABORATORY
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