Expanding our research capabilities

Dying for a drink: BBRO's new drought testing capability, led by Dr Georgina Barratt

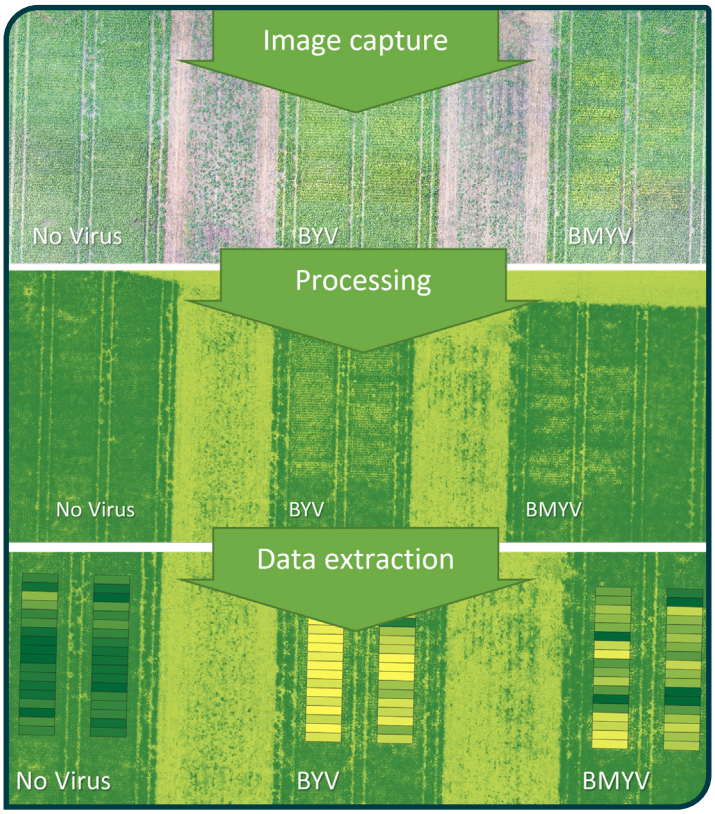
Testing sugar beet varieties for drought tolerance presents a challenge because the plants need to grow as they would in a commercial field, but soil water needs to be restricted. In countries where drought is frequent and often prolonged this can be achieved through growing the beet outside in the field with the use of selected irrigation. However, in the UK drought is harder to characterise, it can occur at almost any time from April to September and vary in length, and in some years there is no drought period at all. For this reason, it is important that UK sugar beet varieties yield well both when water is readily available and under drought. UK conditions mean it is not viable to rely on simple field trials as drought is not guaranteed. To overcome this, BBRO invested in two field scale polytunnels in 2021.

In 2021 the temperature inside the polytunnel was almost the same as outside, throughout the season. The cover reduced the light level by up to 40%, but levels were not atypical of those that are observed in the UK in some years. The polytunnel will be moved each year to prevent the build-up of sugar beet pests and diseases. The BBRO field team did a fantastic job of building and relocating the polytunnels, and their hard work in sourcing and building the polytunnel at short notice reflects their incredible flexibility and abililty to overcome challenges – well done team!

The sugar beet were planted in wooden frames in 2021 like those used in our BCN trials, this allowed for better control of irrigation, preventing water movement between plots. However, for 2022 the beet will be drilled directly into the soil as the use of boxes can alter the physiology of the beet, and these sorts of differences need to be minimised. In addition to the polytunnel, BBRO also invested in a drip irrigation system controlled via WiFi, this was set up on site and powered using solar panels. It is envisaged that the results of the drought trial will be disseminated at the end of the 2022 season, once two years of data has been collected.

How drones are increasing BBRO's research capacity and trial efficiency, led by Dr Alistair Wright

BBRO continues to expand our remote sensing and crop monitoring capabilities to produce new insights into crop growth and pest/disease resistance. Since first putting our advanced drone to use in 2019, equipped with its high-resolution colour, multispectral and thermal cameras, we have flown hundreds of missions and captured many gigabytes of images. However, in the last year the real benefits have started to be reaped from this investment as our data analysis capabilities have developed.



These skills have been developed in house, in collaboration with The University of Nottingham, as part of the recently finished KTP research programme looking at varietal resistance to pest and diseases. We are proud to say that this project received an 'Outstanding' score by the assessors and is a testament to the success of the project.

We now not only can produce large maps and 3D models of the trial plots and commercial fields, but we can now extract quantifiable data from the crop canopy. One such example is the canopy yellowing analysis being undertaken as part of the variety assessments for virus tolerance within Operation Emerald. We have found strong relationships between the crop canopy status in the summer and the final yield achieved under virus infection. These data will help with earlier decision making for variety ordering but also ultimately help with detecting different strains of virus in your crops.