# BYC newsletter – Summer 2019



Welcome to your summer update on the BYC. We're taking this opportunity to keep you up to speed on the 2019 BYC crops. As you can see from the map below, we have a good spread of crops across the beet growing region and we are very busy collecting information and data on these fields.



2018's BYC was successfully completed with the announcement of the winners at Cereals in June – many congratulations to Mark Means and team. Feedback on the 2018 BYC has been very positive and hopefully you have seen some of the great press coverage. The challenge is always for an increase in the quality and quantity of data as this allows us to draw more precise conclusions about why crops have performed as they have and, more importantly, what can we learn so that we can improve performance.

We're responding to this challenge with more regular and consistent crop monitoring and sampling. This includes testing for BCN and doing some leaf nutrient analysis. Like 2018, we're also keeping a watching brief from above and collecting data from the Sentinel-2 satellite which regularly passes overhead (more about this later). Our colleagues at Omnia will also be capturing some crop canopy biomass maps in September, which are very useful in understanding later-season root growth as well as intra-field variation in performance.



# BYC 2019 crops - Plenty of potential to realise

During the summer, we've had some fine weather across most of the beet-growing area and in general BYC crops are looking good although still with plenty of potential to fulfil. The hot weather and recordbreaking temperatures in July resulted in many crops suffering and wilting. Some crops started to look pale and this was mostly related to crops not picking up nutrition in the dry conditions. Recent rain and cooler conditions have alleviated the moisture stress and allowed root growth to continue.



Roots on the 10<sup>th</sup> July in a silt land BYC crop



Early signs of rust in crop near Lincoln

Most crops are at full canopy and are looking healthy although foliar diseases are beginning to show and will need their first foliar fungicides soon, so keep a close look out for first symptoms in your crops.

# Assessing crop establishment

Dry conditions after drilling caused a few problems in some crops, resulting in patchy emergence with sporadic areas of missing plants across the field. In many cases, when checked, seed could still be found in the seedbed. Often the seed coating was cracked open but with no further radicle growth. This indicates that this was most likely linked to dry conditions.



We Maximise Nature's Potential

Earlier this year, **Germains** took pictures of your crops using their **Cyclops system**. Multiple photos, each covering an area of 2 x 3 m, were captured across the field and then analysed using image analysis software (**Fig. 1**).



A canopy photo and a screenshot of Germain's image analysis software in action



The plants were counted, and their canopy area measured, which allows assessment of crop establishment and growth. Germains' photos have generated a lot of data, and we are in the process of analysing this data. You will get a copy of the images for your BYC crop.

Plant counts suggest that establishment for the BYC fields ranged from 65 to 98%, with an average of 82%. This is slightly lower than 2017 and 2018. There was also considerable variation in plant sizes and developmental stages which, again, is likely to be due to dry seedbed conditions. This is something that we've witnessed for quite a few sugar beet crops this year.

Attention to the detail of final seedbed preparation and management of drilling depth so that the seed is being placed slightly deeper where there is more moisture available is key. It is also important to manage drill down pressure and consolidation of the soil by the press wheels. In addition, 2019 conditions lent themselves to post drilling rolling in many cases. How many of you wished you had rolled?

### **Crop Cover from space**

We've been receiving canopy photos from most of the participants in the BYC. Alongside this, we are using satellite images to monitor crop progress. The Sentinel-2 satellite revisits each location every 5 days, capturing NDVI (a value that indicates amount of plant cover). This combination of photos from you and the data captured from the Sentinel-2 satellite gives us a snapshot of your crop's growth. An example of the data generated from one of the 2019 BYC crops is shown below. In this example, the sugar beet crop was preceded by a cover crop which you can see produced between 40 and 50% ground cover. After drilling, the development of the sugar beet crop cover is fairly rapid up to early July when there was about 80% crop cover. It will interesting to see how the hot weather has affected crop cover over recent weeks.

It has been a bit tricky at times using the satellite data because the satellite's sensor cannot see through cloud! The dry weather last year was perfect for using Sentinel-2 images whereas the wet summer the year before gave very few cloud-free images so we couldn't use the satellite to see what was going on.



#### NDVI recorded from Sentinel-2 satellite

# Soil sampling

You may have recently seen a member of our trials team in your field – they were busy collecting soil samples. These soil samples will be assessed for soil texture, organic matter and pH. This information will help us better understand the factors influencing your crops performance. We will also be testing for Beet Cyst Nematode (BCN). BBRO are currently working to better understand the incidence of BCN in sugar beet fields and create an effective means of assessing the performance of BCN tolerant varieties in BCN-infested fields.

## Weed beet

On our travels we have seen a few problems starting to creep into beet crops. One concern is the number of weed beet and bolters visible. There have been fears of extensive bolting this year – the warm February encouraged early drilling on some farms, and then cold snaps hit over March and April, which vernalised plants. Work by BBRO suggests that one bolter per m<sup>2</sup> leads to an 11 % yield reduction. We will be assessing the levels in your crops and using this information to better understand how they have impacted on yield performance this year. We must not forget that these will also act as a source of disease and virus as well as efficient hosts for any BCN in the soil.

## Virus yellows

With the loss of neonic seed treatments, BBRO have been focused on virus yellows and providing growers with the best advice possible. We've been seeing a lot of yellowing in the beet crop, including in BYC fields. Some of this is from virus yellows, but there are quite a few other causes of yellowing. However, in general the patches of virus are limited to a few plants dotted across the field and are most likely where there was primary infection. Secondary spread would appear to be relatively limited (although symptoms may continue to develop into August), a result of some very wet weather in mid-June and, of course, through the use of foliar insecticides.

We're looking at identifying the incidence of aphids and virus through our yellow pan network, as well as identifying potential resistance in new plant lines.



BBRO's field trial investigating beet yellows and beet mild yellowing viruses (two of the three viruses causing virus yellows) across different plant lines. Image captured using BBRO's drone

We'd like to know, **have you found virus yellows in your crop?** To identify virus yellows: Virus yellows appears as yellowing of leaves, which often are crunchy to the touch. We've had some growers identifying virus yellows when in fact they have downy mildew (downy mildew gives the same symptoms but also presents purplish fungal growth on the heart leaves) or capsid bug damage (these bugs damage the mid-vein leading to the leaf dying off, often found in the headlands).



## Images of virus yellows

We hope you have found this a useful update, and we look forward to hearing back from you.

Kind regards,

The BYC Team