

Fruition Hawke's Bay Season 2019-20 Overview

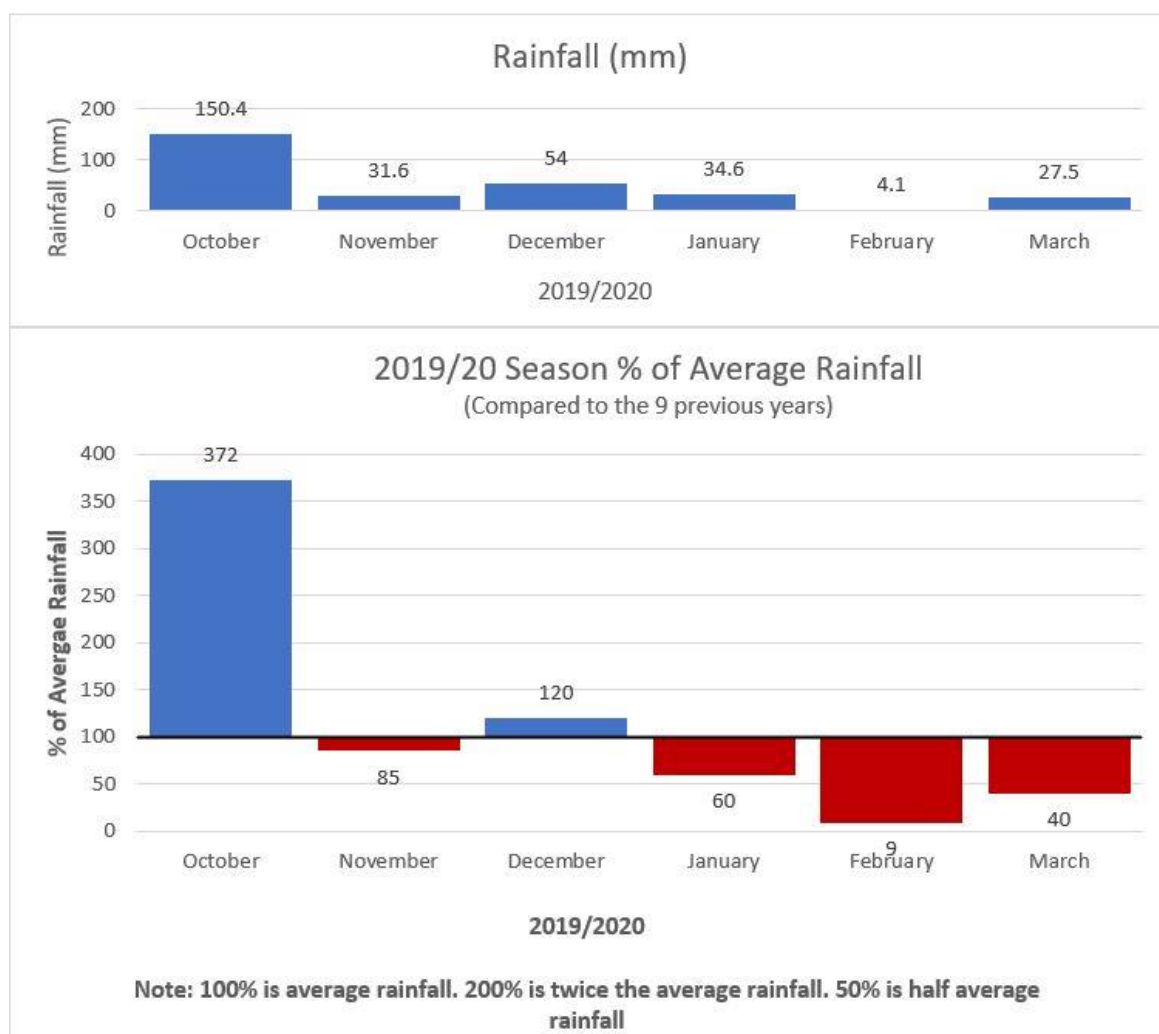
Season 2020 is rapidly drawing to a close. In this newsletter / advertorial, the Fruition Hawkes Bay team offers you a brief review of some aspects and backgrounds new services that we offer:

Best regards,

Jack Hughes

Soil Moisture Monitoring

We began the 2019-20 season with a drier than normal soil profile. Winter rainfall was below average and soil profiles were around 50% prior to October which produced a significant amount of rainfall, but usually not enough to bring the profile up to field capacity. From November onwards, with the exception of December, well below expected average rainfall occurred. Targeted, efficient irrigation played an important role in maintaining growth, tree health and fruit sizing.



Data courtesy of Metwatch: Ruahapia Automatic Weather Station

The importance of post-harvest irrigation

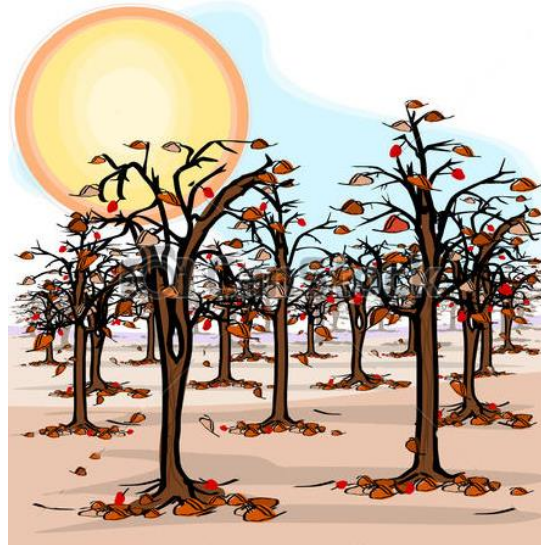
Post-harvest irrigation is a critical and often neglected requirement.

Before leaf fall, large concentrations of carbohydrates and nutrients are moved and stored in the trunk and roots. In addition, root growth starts again after harvest but not as strongly as in early spring.

These processes are dependent on available soil moisture and soil temperatures. Dry soils and low temperatures slow or stop root growth, carbohydrate, and nutrient uptake.

A deciduous tree has to come out of dormancy, regrow their leaves, initiate root growth, produce buds and bloom and begin developing fruit, all at the same time, and without the full use of its leafy factories. If good levels of 'carbs' haven't been stored away in the previous autumn all of these processes may be compromised.

Many orchards have opted for a regulated deficit irrigation regime and the associated soil moisture induced tree stress prior to harvest. This has greatly helped fruit colour development and reduced unnecessary shoot growth, but it makes it all the more important to apply post-harvest irrigation to allow replenishment prior to dormancy.



Typically, we would expect rainfall to assist in providing readily available water to the trees post-harvest. However, because of well below average rainfall in Jan, Feb, Mar and likely April it is apparent that this cannot be relied upon. Post-harvest irrigation is the solution and one that can be targeted and controlled.

- Important to apply post-harvest irrigation prior to leaf fall
- There is no need to bring the soil profile back up towards full field capacity rather to ensure that soil moisture is at a level where water induced stress is not occurring (we suggest above 50% of the soil profile)
- In this exceptionally dry autumn (at the time of writing!) most blocks need three or four 30mm irrigation applications over the period of 4 weeks to bring the soil profile up to where it needs to be.
- The graphs below show two scenarios. The first (Fig.1) shows a dry soil profile with very limited readily available soil water. This site would require post-harvest applications as mentioned above.



Figure 1: Dry soil profile heading into harvest. In this example it is very important to apply sufficient post-harvest irrigation to ensure soil water is readily available.

The second graph (Fig.2) shows a soil profile above 50%. Little or no post-harvest irrigation is required at this site.

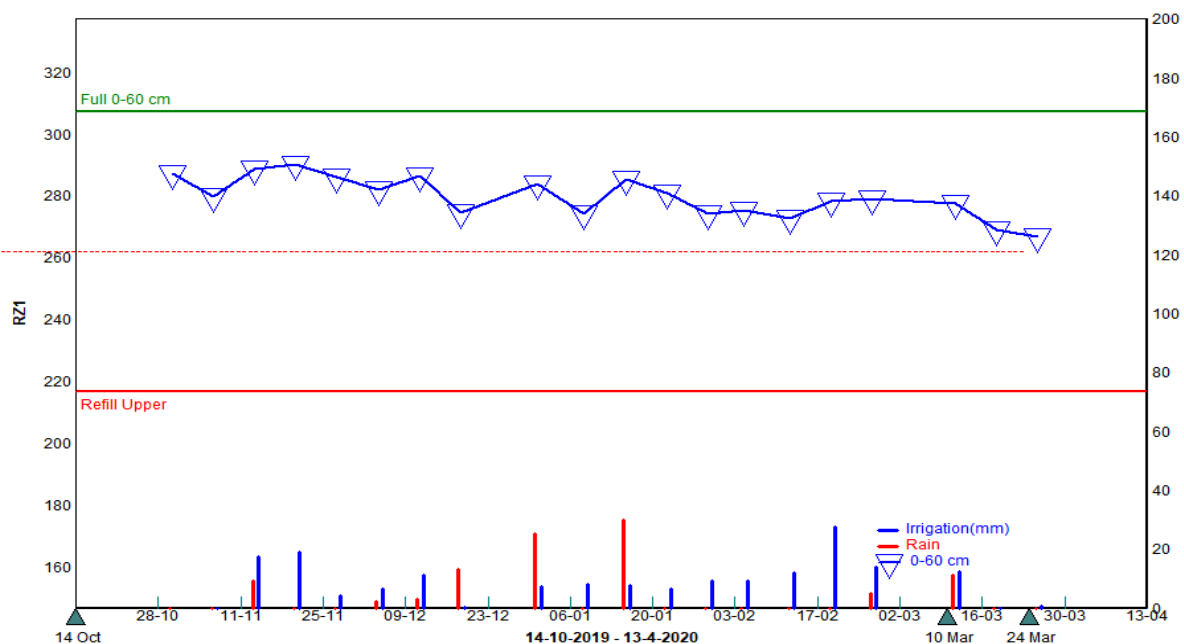


Figure 2: Soil profile maintained at a higher soil moisture level throughout the season. Little requirement for post-harvest irrigation as readily available water is already present.

Seasonal trends in Codling Moth activity

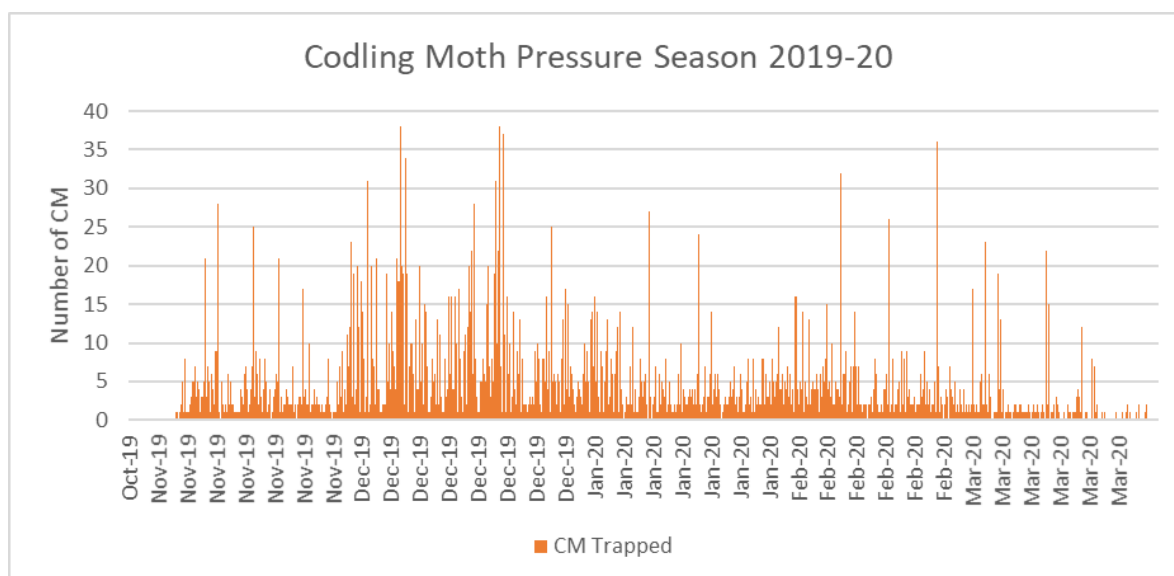
Season 2019-20

Codling moth (CM) flight activity got off to a subdued start in season 2019-20. (Graph 1). Apart from a few outliers, the number of moths caught per monitoring day in November was usually below 10 during the first monitoring month. Despite this 1st generation being low in numbers, it is a critical

period for managing this pest. Loss of control at this time usually leads to greatly increased damage for the rest of the growing season.

Warmer temperatures in December coupled with prolonged dry weather saw increased CM activity. Traps often caught more than 15 moths in a day. The highly recommended 700-780 GDD CM spray application targets 2nd generation larvae, where the majority of hatch occurs. This spray is proven to help curtail pest infestation over harvest.

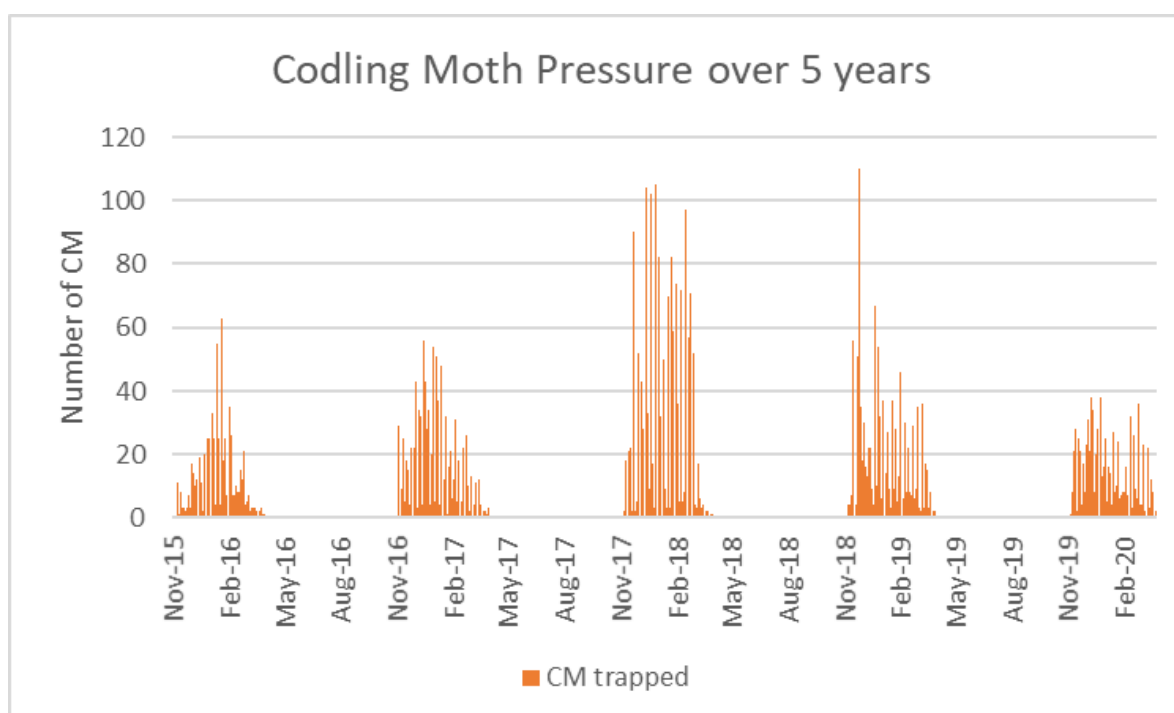
Graph 1



The last 5 years

The following graph 2 summarises CM trap catch over the last 5 seasons across our whole database. Season's 2017-18 and 2018-19 recorded higher peak CM trap catch than other years. While there appears to be a slight declining trend in 2019-20, there's no room for complacency when it comes to keeping the lid on CM populations and ensuring access to our good paying, sensitive markets.

Graph 2



Crop and canopy scanning



We've completed our first season of exploration and development of the Green Atlas Cartographer. (here's the same machine in Australia <https://greenatlas.com.au/cartographer/>).

It's been a fun ride as we've worked with clients to develop crop and canopy scanning capability in apples, grapes and kiwifruit.

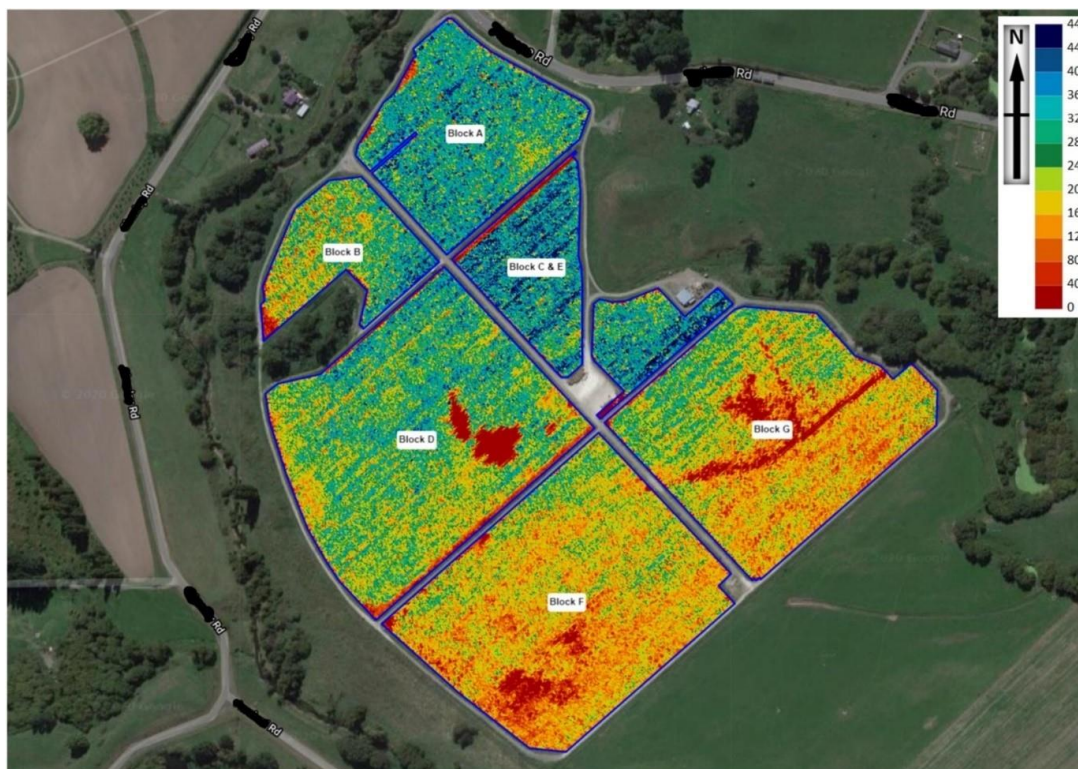
The gear captures truckloads of data quickly – at 15 km/hr, the cameras are taking 7 pictures per second and racking up to 100,000 images to map a 5ha block. Meantime the Lidar scanner is sensing canopy volume and density and correcting GPS positioning.

While the scanning is fun, we do have to admit that there has been some pretty tedious behind the scenes work 'labelling' the images which tell the software algorithms what to look for and count. The good part of that is that the more labelling work we do the better the detections and counts will be.

Of course, it's all about practical end uses of the data. Crop estimation is an obvious one. Let's face it, who enjoys counting fruit? A possibly bigger deal will be using the data to raise profitability by optimising the crop and reducing variation within each block. The scans typically show us that there is more variation within blocks than we have really been aware of.

Next step is to take a leaf out of the precision agriculture book and create prescription maps that will tell (accurately calibrated) sprayers where and how much chemical thinner, PGR or other products to apply. The same goes for fertiliser spreaders – to put it where it's needed and not where it ain't.

The map below is fruit count density and has been calibrated using post-harvest bin counts. The scale on the map represents fruit count per tree.



Layered maps that will show changes over time and provide base information like soils, drainage and elevation maps along with data from other sources like NDVI vegetation indices from satellites. It is exciting to be well underway doing things that up till now we only hoped would one day be practical and affordable to do.

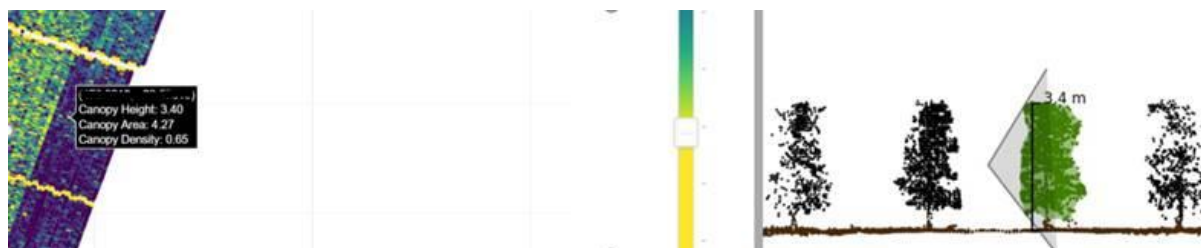
Fruition (HB) Ltd and Applied Research Technology (Dr David Manktelow) have an exclusive collaboration agreement with Green Atlas in New Zealand.

Sprayer Calibration

Winter is fast approaching, and we are gearing up for another calibration season. We have made some improvements to how we report on calibrations with a focus on tailoring sprayer setups to the crop being sprayed.

Canopy Mapping

Our Green Atlas crop scanning machine is undergoing continuous development and we are now able to map canopy geometry. We can produce 3 separate maps - canopy height, canopy area and canopy density. This is an exciting development and it is our intention to use these maps in the future to aid decisions around sprayer setup and to create prescriptions for variable rate spraying.



Preparing your sprayer for calibration

Sprayers should be serviced prior to calibration to ensure all components are functioning correctly. If the sprayer is not in good working order it can cause unnecessary delays and increase the overall cost of a calibration. The pressure gauge and regulating valve should be functioning correctly, filters and nozzles should be clean and correctly installed. Pre-filling the tank with water will save time too, approx. half a tank is fine.



To book your sprayers for a calibration contact one of our certified calibrators:

Jason Bennett jason@fruition.net.nz 021 221 7225

Andrew Mawley andy@fruition.net.nz 021 522 614

Growsafe Winter 2020



Wow, how time flies, it has nearly been a year since Fruition HB started to deliver Growsafe courses in Hawkes Bay and for the last few months we have been expanding to other regions.

We are providing courses that are interactive and informative for the trainees. When they leave at the end of the day, they will actually remember the course and have enjoyed it. Class participation and involvement is vital and the odd bit of banter and sharing of experiences makes it more interesting.

There are some new and exciting things ahead for the future with a lot of focus being put on individual sectors and providing tailor-made courses to meet crop specific requirements. We like to deliver courses onsite which is great for trainee's as we can interact with the machinery and surroundings that they are used to. This can also be of benefit for those who are less comfortable in a classroom or unfamiliar environment.

I suppose to sum it up we aim to deliver courses that are fun, interactive, informative, on topic and beneficial to all. The catering is not bad either!

NZ Gap Services

NZGap stands for New Zealand Good Agricultural Practice and is a recognised certification programme providing compliance to fruit and vegetable growers.

As consumers become progressively more concerned about where their food is grown and what food safety measures are being taken, this certification standard is there to ensure that food is safe for consumption.



It involves compliance in three key areas: Social Practice, Environmental and Food Safety.

NZGap certification provides growers with the appropriate on farm systems to achieve this standard. It is an audit process that takes place once every 3 years after initial registration.

Fruition Hawkes Bay is providing a consultancy service to aid growers in gaining their NZGap certification. This will involve:

- an onsite visit where we will review your farm and its operational procedures,
- a full run down on the NZGap standard with help on understanding what is required,
- and assistance with producing a manual tailored to your business with all the relevant checklist points completed.

For more information please contact:

Lizzy Wicken lizzy@fruition.net.nz 0277804516

Next Season 2020-21

Fruition will continue to work alongside our clients in 2020-21 providing quality support and results. We are fired up in providing quality data, useful decision support and contributing to your success.

Kind regards,
Fruition HB Team