fargro®

Sainsbury's

Sainsbury's (GIG)
Grower Interaction Group

About

In 2006, Sainsburys launched its Crop Action Groups to bring growers from specific crop areas together to find solutions to shared challenges. Since then, the number and size of these groups has grown considerably.

Sainsburys started with groups mainly in the UK and Europe, focused around key produce areas in salad, fruit and vegetable production. With the success of these groups paving the way for further groups in other crop areas.

They now have groups operating across over 30 crop types in many countries around the world. These groups bring growers together to discuss best practice in their crop area, helping to drive environmental sustainability and production resilience.

Fargro has been working with Sainsbury's strawberry grower group in the UK to help their suppliers to better understand and optimise the use of ecologically friendly options for crop protection – such as biopesticides and biological controls.

Sainsbury's (GIG)
Grower Interaction Group

Changing pest management landscape

The landscape for crop protection is changing due to increased regulation, resistance issues and consumer demands. This ultimately means that growers have fewer conventional chemical pesticides available to protect their crops with – which risks hampering their ability to maintain good yields and high-quality crops.

Fortunately, alternative crop protection products do exist – based on biological modes of action rather than chemical ones, making them friendly to the environment and the consumer. These products include predatory insects, such as ladybirds, or beneficial bacteria that can protect crops from fungal diseases.

Whilst the use of these controls offers a sustainable solution to protect crop health, they are living organisms and so must have the correct environmental conditions to ensure their establishment and activity in the crop. As well as this, many work best when the pest numbers are at or below a certain level – struggling to provide knock-down of very established populations. This makes the opportunities for their use more restrictive than those for their chemical counterparts – meaning they can be difficult to apply effectively.

Therefore, it is vital to ensure that applications are done carefully in order to provide the organisms with suitable conditions and infestation levels to optimise their efficacy.

Fargro worked with the Sainsbury's strawberry grower group to look at how we can use in-crop environmental sensor technology to ensure the optimal application of predators to combat Thrips, one of the primary insect pests of strawberries.

fargro®

Sainsbury's

Sainsbury's (GIG)
Grower Interaction Group

CASE STUDY

How digital tools can be used to make crop protection environmentally and financially sustainable

The Problem

Thrips are small pests (often only a few mm) that live across the plant. Thrips cause extensive damage as they feed by lacerating plant tissue to consume the inside of cells, causing discolouration and deformation of the buds, leaf tissue and flowers, as well as spreading plant viruses. They have fast growing populations with a quick reproductive cycle, a wide host range and can overwinter on crops, within the soil and on host weeds – making them especially destructive pests.

There are a number of biological control options for Thrips, but they are expensive to growers and so it is vital to ensure that the conditions and pest population levels are correct for the predator to protect the crop. Therefore, it is critical for growers to be able to ensure the conditions are correct for application. This can be done by monitoring the environment to understand the population of the pest and whether the conditions are suited to the predator.

TECHNICAL 01903 721 591
EMAIL TECHNICAL@FARGRO.CO.UK
WEB WWW.FARGRO.CO.UK

fargro®

Sainsbury's

Sainsbury's (GIG)
Grower Interaction Group

CASE STUDY

Incorporating data and sensors into the IPM programme

AVERAGE DAILY TEMPERATURE
THRIPS COUNT

The Solution

In the initial seasons of the project, the group focused on data collection.

In-crop environmental sensors and weather data was used across the sites of group members to collect a picture of the environmental conditions inside each of the facilities where the strawberries were housed. This was overlaid with observational data captured about pests from crop walks of the sites. By marrying the observational data with the sensor data, we were able to understand the conditions that lead to a major outbreak of thrips.

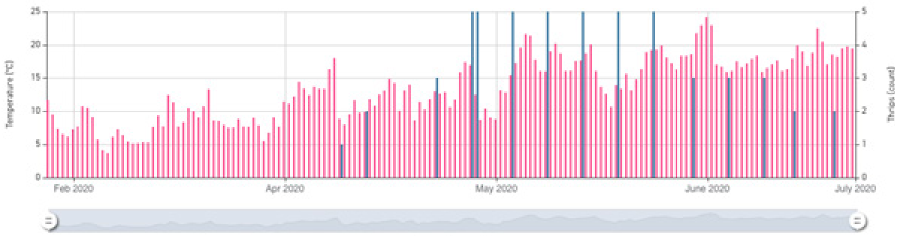


FIGURE 1

The above graph shows the average daily temperature in pink, and thrips count in blue. In the above example, biological control was applied between April and May, this was after the first recorded observation of thrips.

Thrips numbers continued to grow significantly despite the application and for 6 weeks the grower suffered extremely high pest pressure. It was thought the biological control was applied too late to control the already established population - biological controls of this nature are best applied preventatively to predate thrips as they enter the crop.

TECHNICAL 01903 721 591
EMAIL TECHNICAL@FARGRO.CO.UK
WEB WWW.FARGRO.CO.UK

fargro®

Sainsbury's

Sainsbury's (GIG)
Grower Interaction Group

CASE STUDY

Incorporating data and sensors into the IPM programme

However, all was not lost, as the data on environmental conditions and thrips observations was able to be used alongside scientific literature to create a thrips prediction tool that models the development speeds for thrips at different temperatures (Figure 2).

Figure 2 shows the tool being utilised for growers in the following season. The widget uses a metric called Growing Degree Hours (GDH) to model thrips development. Growing degree hours operates based on the link between thrips development speed and ambient temperature – with them growing faster the hotter it gets. Therefore, we can use the hourly temperature to estimate how quickly the thrips will reach reproductive maturity and so how quickly the population will grow. We're also able to look into the near future to pre-empt infestations. The 'Now' bar on the chart highlights the current date, with the tool using forecasted weather data to predict the thrips development based on temperatures.

We set a threshold for year 2 at a GDH of 3150. This was the level of the first observed thrips at the grower's site in year 1. As the threshold is approached, they should apply their biological controls so the predator population can be established to predate incoming thrips – suppressing their population numbers and protecting the crop. As well as not acting too late, it's important to avoid applying too early because a cold snap can have a detrimental impact on the applied biological controls. The tool, therefore, gives the grower the ability to optimise their timing.

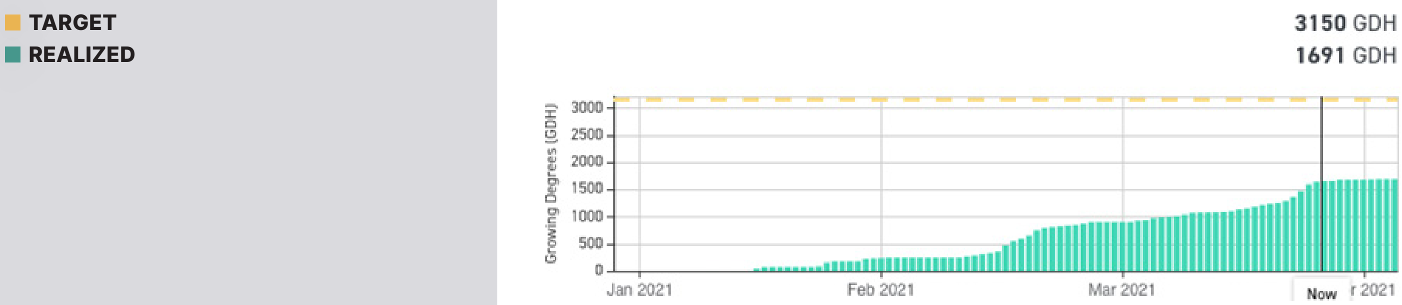


FIGURE 2

TECHNICAL 01903 721 591
EMAIL TECHNICAL@FARGRO.CO.UK
WEB WWW.FARGRO.CO.UK

fargro®

Sainsbury's

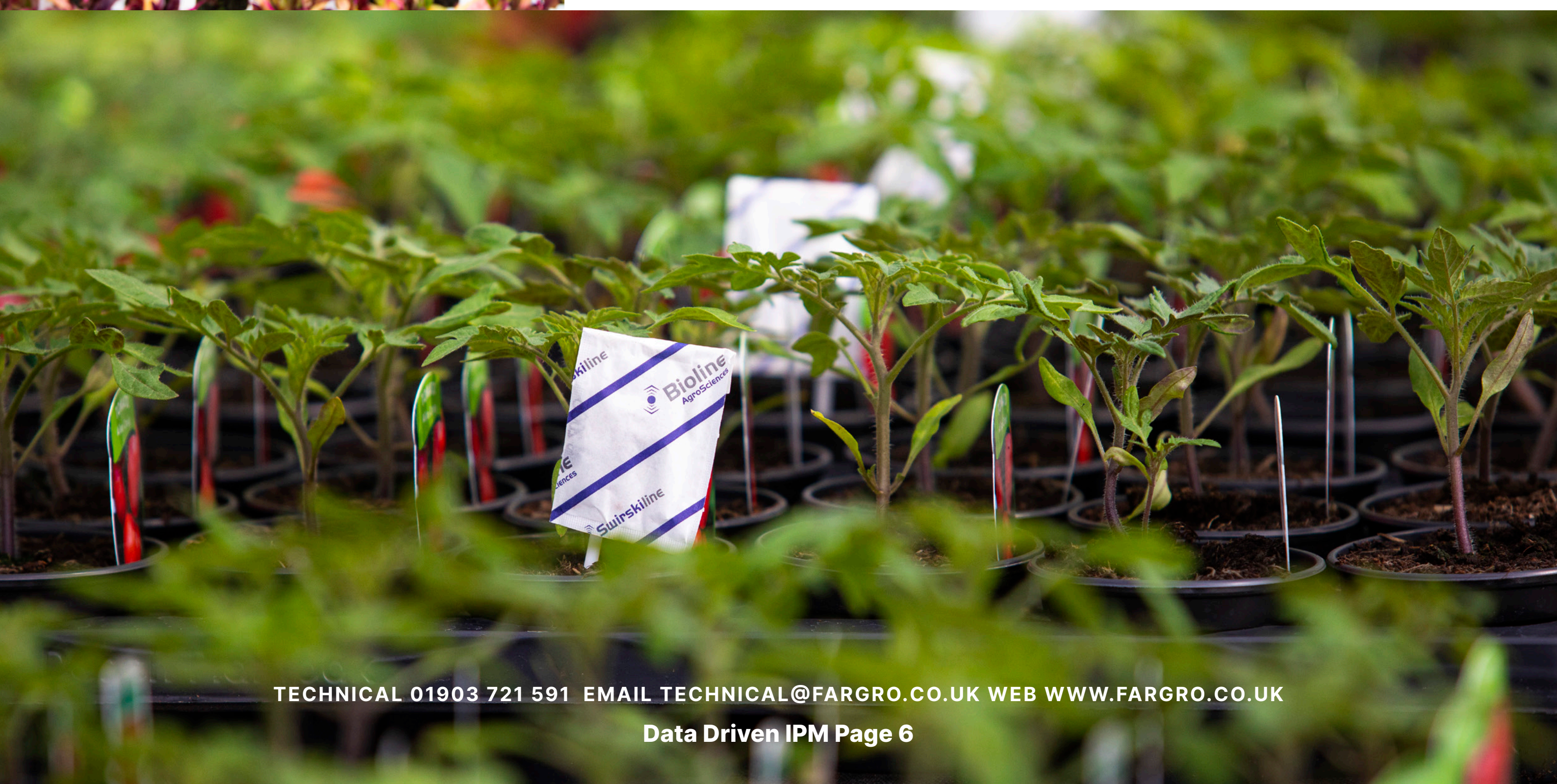
Sainsbury's (GIG)
Grower Interaction Group

Impact on the Grower

Growers using the tool had technical and economic justification to apply biological control earlier than usual. The timings were successful, and the growers reported back that they achieved better control of thrips – significantly boosting yields. This has inspired growers and operators on-farm to begin accessing this data regularly to inform their applications of crop protection products.

However, management of this on farm is still an issue for growers. There is time required to understand the charts, which can be difficult to fit into the already packed schedule of growers and operators.

There is an appetite for services that translate their data into easily understood suggested actions that can improve growing practices. As a result, Fargro have been working on the development of a comprehensive digital agronomy solution that is able to take grower data and automate the analysis to provide growers with easily actioned insights – saving the grower time and optimising crop health.



fargro®

Sainsbury's

Sainsbury's (GIG)
Grower Interaction Group

"Digital tools will be a cornerstone of horticulture in the coming years"

The future of digital agronomy

Digital tools will be a cornerstone of horticulture in the coming years, however, it is vital that as well as providing useful advice, the tools must be easy for growers to use and not require any added time from the grower to manage. Our system has been designed to streamline already existing crop management processes, link grower observations from these with environmental sensor data and then automatically model, forecast and suggest actions for the whole array of common pests and diseases faced by strawberry growers.