



# **Grower Summary**

## **SF/TF 170**

**Towards year-round production of  
UK strawberries**

Annual report 2021

**Project title:** Towards year-round production of UK strawberries

**Project number:** CTP\_FCR\_2019\_8

**Project leader:** Sophie Read, University of Reading

**Report:** Annual Report, January 2022

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**Location of project:** University of Reading

**Industry Representative:** Richard Harnden, Berry Garden Growers Ltd, Harriet Duncalfe, Berry Garden Growers Ltd

**Date project commenced:** 01/10/2019

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## AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

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Date: 09/01/2022

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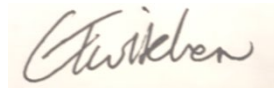
Date: 11/01/2022

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Date: 11/01/2022

# GROWER SUMMARY

## Headline

Night-break lighting (NBL) reduces strawberry chill requirements promoting earlier fruiting under natural light potentially reducing LED lighting requirements. NBL increases yield and berry number of Junebearers and Everbearers. These, grown together, can maximise yields and season extension, since Junebearers produce short, high-yielding flushes and Everbearers yield for extended periods.

## Background

Strawberries make up the largest proportion of the UK's soft fruit sector, which in turn is the largest category in the UK's overall fruit sector (New Food, 2018; IBISWorld, 2020). Consumption of strawberries in the UK has increased over the last 20 years with the UK having one of the highest per capita consumption rates in Europe (3 kg/yr) alongside Italy and Germany, compared to the European average (1.64 kg/yr). In recent years, new consumer demands have become apparent coinciding with increased environmental awareness, a desire for self-sufficiency and increased availability of more sustainable, locally-produced fresh produce (CBI, 2019). Over the same period, the UK strawberry industry has increased its home strawberry production by 230%, but imports have also risen by 70% showing that there is still a production gap between supply and demand (DEFRA, 2021). The current UK strawberry growing season is from March to November which has increased from a 6-week period from June-July in the 1980s. The extended season has been achieved as a result of new strawberry cultivars as well as an increase in protected horticulture with polytunnels and heated/lit glasshouses (CBI, 2019). To progress further towards complete self-sufficiency for UK strawberry production, there is a need to extend the growing season over the winter to fulfil year-round production. This involves further investigation into different cultural and environmental factors influencing strawberry plant development, including vegetative growth, fruit yield and fruit quality in order to develop optimal growing models for a range of cultivars.

Objectives of the CTP Project:

- To investigate the use of new specialist low-chill strawberry cultivars to produce out-of-season UK strawberries in winter glasshouse production.
- To explore different environmental and cultural growing conditions to develop optimal growing models for winter glasshouse production.
- To develop chilling models for major Junebearer and Everbearer cultivars.

- To carry out an economic study to balance the costs of delivering environmental conditions including lighting and heating with the financial returns from out-of-season strawberry production.

## **Summary**

In the second year of this PhD project, a winter glasshouse experiment was set up to investigate the effect of night-break lighting (NBL) and application of gibberellic acid (GA<sub>3</sub>) to reduce strawberry chill requirements of a specialist low-chill Junebearer (JB) and an Everbearer (EB) variety. In addition, three light regimes were incorporated, including a natural light, a low LED supplementary light intensity and a high LED supplementary light intensity regime. The plants were all maintained under a 22°C/12°C day/night temperature for 10 weeks from planting, followed by a 16°C/12°C day/night temperature prior to fruit-set until the end of the experiment. The plants were kept under a 16 hr photoperiod consisting of 12 hrs of either natural light or LED light followed by 4 hrs of low-power extension lighting. NBL reduced the time to first fruit in the natural light environment but did not have an effect in the LED-lit environment and generally increased berry yield as a result of increasing berry number. On the other hand, GA<sub>3</sub> delayed fruiting time and resulted in a reduced yield. Further data analysis will be conducted to review these results along with a follow-up economic assessment to estimate the financial and economic costs of the concluding optimal production models.

## **Financial Benefits**

This report outlines the key results from work carried out in the second year of a four-year PhD project and hence, no direct financial benefits have been confirmed yet. However, the third and fourth year experimental series plans to pull together the key findings relating to optimal growing conditions for out-of-season strawberry production from the first two years of results focussing on fruit timing, yield and quality. An economic assessment will be carried out in the third year to calculate the costs of the growing conditions found to be optimal for winter strawberry production. This will then contribute to a final year experiment which will bring all the optimal environmental and cultural conditions together into a single model. The economic assessment is designed to optimise the energy requirements for artificial lighting, heating and other environmental conditions needed to fill the production gap with a strong emphasis on sustainable production.

## **Action Points**

There are no grower action points at this early stage of the project.