

Research Paper

Essential irrigation and the economics of strawberries in a temperate climate

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ABSTRACT

Strawberries are a high value crop in the UK soft fruit sector, with the majority of production grown at field-scale and under protected (polytunnel) conditions. Despite its importance to the rural economy, there is surprisingly little published scientific evidence on the economics of irrigated strawberry production and the value of water in this horticultural sector. A survey of growers, supplemented by secondary data and industry sources, shows considerable variation in key physical and financial performance indicators, both within and between different strawberry production systems, as well as evidence of good practice. Water application depths ranged widely from 800 to over 2000 m³ ha⁻¹ according to grower and crop variety. Irrigation costs typically range between £1.30 and £2.50 m⁻³ of water applied, highest where storage reservoirs and public water supplies are used. The average value of irrigation water for strawberry net of costs was about £6 m⁻³, much higher than for field crops such as potatoes. The importance of a reliable water supply to support irrigated strawberry production is highlighted. Climate change and growing pressures on water resources are likely to force a greater interest in irrigation economics in the soft fruit sector, especially in the face of restrictions on summer abstraction and rising competition and charges for using public water supply.

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1. Introduction

The UK soft fruit sector has experienced a strong and sustained period of growth over the last two decades, with the fruit increasing in popularity each year due to its nutritional and dietary characteristics and to advances in post-harvest storage and processing (Nour et al., 2011). In addition to fresh consumption, the fruit can also be frozen, processed and dried, thus having a wide range of uses in both the fresh (supermarket) and processed sectors. Despite its increased economic importance to some regional rural economies, there is surprisingly little published scientific evidence on the economics of strawberry production. In the UK, strawberry plantings have increased by over 30% since 2000, exceeding 4,500 ha in 2015 and producing about 115,000 t of marketable fruit (Fig. 1) valued at c£284 million, equivalent to approximately 39% of the total value of national fruit sector production (Defra, 2015). The domestic sector has further growth potential as a third (32%)

of the total UK market supply in 2015 was imported (Defra, 2015). Growers in the UK now regard irrigation as an essential component of production to increase yield and quality and to increase levels of local production to substitute for imported products (Defra, 2010; Knox et al., 2009; Knox and Hess, 2014). The English Food and Farming Partnerships (EFFP), however, report that short term seasonal changes in UK weather could generate large fluctuations in future demand-supply balances which would make it even more difficult for UK growers to meet consumer demand (EFFP, 2010).

Else and Atkinson (2010) reported on the impacts of climate change on irrigation water demand for strawberries in the UK that would most likely lead to a substantial increase in water abstraction and irrigation costs. For soft fruit, including strawberries, they reported that the main concern related to increasing temperatures and the consequent increase in evaporative demand, plant transpiration rates, and hence crop water use. An extended growing season due to warmer temperatures would exacerbate the situation. Climate change would also result in reduced summer rainfall, particularly in south east England where most strawberries are grown (Fig. 2), where sectoral competition for water is most acute and where available water resources are most constrained (Hess et al., 2010). In addition, a number of water regulatory and policy

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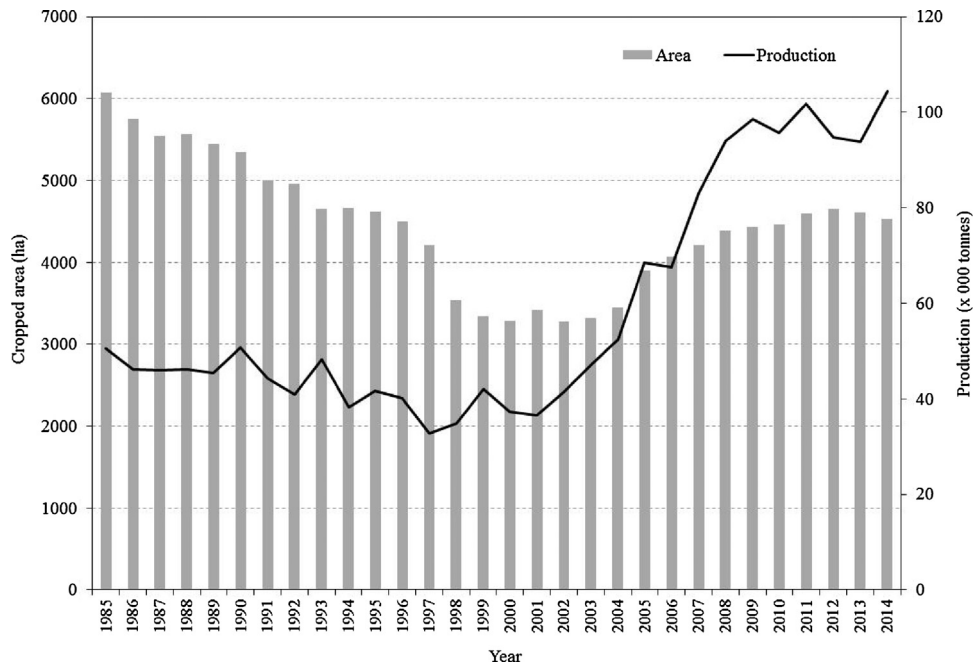


Fig. 1. Cropped area (ha) and production ('000 t) of strawberries in the UK between 1985 and 2014.

(Source: Defra, 2015)

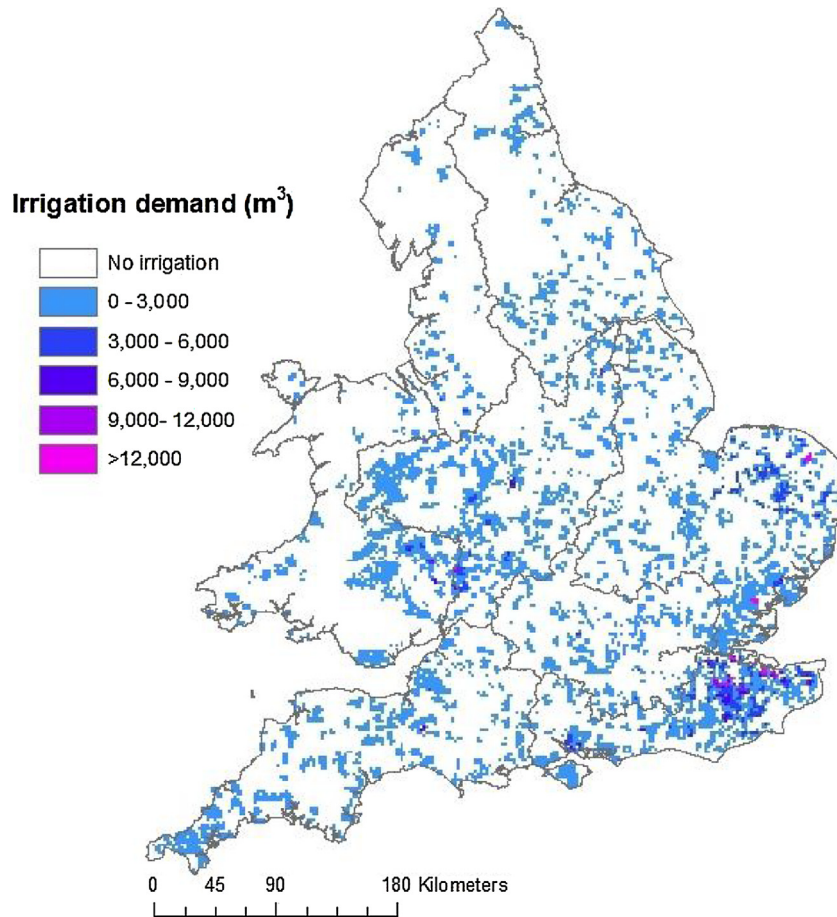


Fig. 2. Spatial distribution of irrigation water demand (m^3/km^2) for strawberries in England and Wales.

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