

New Project

SF 137

Timing of nitrogen applications to optimise growth and yield without adversely affecting fruit storability and frost sensitivity

Project Number:	SF 137
Project Title:	Timing of nitrogen applications to optimise growth and yield without adversely affecting fruit storability and frost sensitivity
Project Leader:	James Carew
Contractor:	Farm Advisory Services Trust (FAST) Ltd
Industry Representative:	Laurie Adams, Hall Hunter Partnership
Start Date:	01 March 2012
End Date:	31 December 2015
Project Cost (Total Project Cost):	£47,834 (£50,044)

Project Summary:

To maximise yield of blueberry bushes optimum growth of canes is required with larger bushes having significantly greater potential yields. However, clear recommendations on the level of nitrogen required are not available.

Accurate nitrogen application is important to encourage growth but is not without potential problems. During fruiting, high nitrogen application has been shown to reduce fruit firmness in a number of crops and may reduce blueberry storage life. Commercial experience has shown that frosts during autumn and winter can have significant effects on yield and late nitrogen applications seem likely to increase sensitivity to frost. Excessive nitrogen applications at the time of autumn flower initiation have the potential to reduce flower number. Each of these effects will have a considerable influence on yields.

This project will address these issues by firstly testing the effect of three constant levels of nitrogen during the first six months of the project. Then, over the following three seasons, the effects of increasing or decreasing nitrogen levels during three critical phases of growth: early spring growth, fruiting and autumn flower initiation will be tested.

Aims & Objectives:

(i) Project aim(s):

To determine the effect of nitrogen application regimes on growth, fruiting, storability and frost sensitivity of two blueberry varieties – Duke (Midseason, protected in a Spanish tunnel) and Aurora (Late, outdoors)

(ii) Project objective(s):

1. Determine the effect of nitrogen at 60ppm, 120ppm and 180ppm nitrogen on shoot growth of cvs. Duke and Aurora blueberry bushes at the end of each nitrogen treatment application – first green fruit, end fruiting, 90% leaf fall
2. Determine the effect of nitrogen applications on yield, fruit quality, fruit storability and flower initiation
3. Monitor effects of winter frost on growth, flowering and fruiting
4. Conduct regular nutrient analysis of leaves and feed solution input/runoff to determine uptake of nutrients in each treatment
5. Determine the effect of treatments over three years to enable seasonal differences particularly in the case of frost damage to be determined
6. Publicize results from project in HDC News, HDC Conference, FAST Conference and peer reviewed journals

Depending on the effects of treatments, a grower open day will be held to demonstrate effects

Benefits to industry

The blueberry crop is relatively new to the UK and with most being grown in pots, there is a need for data on the nutrition requirements of blueberry plants. Worldwide, the UK is unique in its reliance on pot grown systems for blueberries and so to date research overseas has generally been conducted on field grown crops. This work would lead to a number of commercial benefits:

- Pot grown plants are more sensitive to changes in the nutrients applied through the irrigation system and so this presents growers with an opportunity to manipulate nutrient balance to improve production
- An understanding of the role of nitrogen at specific times of the year in driving growth of blueberries would allow the targeting of nitrogen applications where they would have most benefit

- Determining how or whether nitrogen can be applied in the run up to fruiting without reducing storability may extend the market for UK blueberries through extended storage durations
- Yield losses due to frost damage are not sustainable and so a method of reducing the risk of frost damage is needed

The potential of manipulating nitrogen application therefore needs to be tested to determine whether this would have the desired effects – maximum growth and yield without the negative effects on fruit storability and frost sensitivity. This would improve reliability of production, allowing more confident investment in UK plantings.

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Email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below:

HDC
AHDB
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

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