Grower Summary

SF 159a

Extension of Innovate UK 102132. Winter chilling in blackcurrants: adapting to climate change, through new technologies for improved dormancy release

Final report 2020

Project title:	Extension of Innovate UK 102132. Winter chilling in blackcurrants: adapting to climate change, through new technologies for improved dormancy release
Project number:	SF 159a
Project leader:	Adrian Harris, NIAB EMR
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Key staff:	Adrian Harris
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Industry Representative:	n/a
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The results and conclusions in this report are based on an investigation conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.

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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GROWER SUMMARY

Headline

Dormancy breaking in blackcurrant can be simply and effectively managed with the application of a dormancy breaking product at 3% green tip, either using a commercially available product:

- Brecaut LG 440 + Brecaut LG 441
- Bluprins + Bluact
- Erger + Active Erger

Or via a fertilizer mix of readily available products:

Treatment	Nitrogen source	Citric acid Conc.	Glucose Conc.	Wetter
Basal C	Ammonium nitrate (5 kg/hl)	2%	2%	Brecaut LG 441 (0.8%)
Basal A	Calcium nitrate (10 kg/hl)	2%	2%	Silwett L-77 (0.05%)
Basal C	Ammonium nitrate (5 kg/hl)	2%	2%	Silwett L-77 (0.05%)
Basal A	Calcium nitrate (10 kg/hl)	2%	2%	Wetcit (0.25%)
Basal C	Ammonium nitrate (5 kg/hl)	2%	2%	Wetcit (0.25%)

Background and expected deliverables

Blackcurrants require a prolonged chilling period to induce and synchronise flowering. With current fluctuations in the UK climate, blackcurrants are regularly failing to achieve the chilling required to allow buds to break evenly and fully, resulting in decreased yields and fruit quality. Under Innovate UK 102132 project “Winter chilling in blackcurrants: adapting to climate change, through new technologies for improved dormancy release”, new bud breaking products and combinations of nutrients were tested for their effect on bud breaking in blackcurrant. This project aims to unite the findings from work package 3 of the Innovate UK project and combine the most efficacious nutrients into a single treatment to validate findings, explore cheaper

alternatives to the most expensive components of the mix and to test new commercially available products for bud breaking potential to protect the security of the supply of UK blackcurrants in a changing climate.

Summary of the project and main conclusions

Replicated small plot trials were undertaken in three blackcurrant plantations across Kent (Table 1).

Table 1. Replicated small plot trials in Kent

Site	Manager	Farm name	Address	Variety
1	John Hinchliff	Nackington Farm	Nackington Road Canterbury CT4 7BA	Ben Alder
2	Hugh Boucher	Newlands Farm	Teynham Sittingbourne ME9 9JQ	Ben Tirran
3	Graham Caspell	NIAB EMR	New Road East Malling ME19 6BJ	Ben Tirran

All three trials featured Erger + Active Erger as an industry standard and compared it to Basal A (Calcium nitrate) or Basal C (Ammonium nitrate). Erger + Active Erger was not always effective at inducing bud burst (nitrogen source trial on Ben Alder), suggesting that there are other factors involved in dormancy breaking than just the accumulation of chill hours and there may be other varietal effects involved.

In the two trials where significant results were obtained (wetting agent and industry alternatives), Basal A (Calcium nitrate) or Basal C (Ammonium nitrate) were never significantly different to each other, indicating that either Calcium nitrate or Ammonium nitrate, can be used as a nitrogen source for dormancy breaking.

The most startling result from the programme of work was how important the choice of wetting agent is in dormancy breaking, with the use of Silwett l-77 massively increasing the efficacy of both Basal A and C. This observation was borne from the use of the Brecaut LG 441 wetting agent with Basal C in the industry alternatives trial, as it significantly increased the efficacy of Basal C.

Stocks of Erger in the UK can often be limited so it would be beneficial to investigate the supply of Brecaut and Bluprins as both are equally effective at dormancy breaking in blackcurrant.

Main conclusions

- Both Calcium nitrate (Basal A) at 10 kg/hl or Ammonium nitrate (Basal C) at 5 kg/hl are equally effective as the nitrogen source in a dormancy breaking mix.

- Silwet L-77 increases the efficiency of both Basal A and C.

- Brecaut and Bluprins are the most effective of the three commercially available dormancy breaking products.

- The inclusion of the Brecaut LG 441 wetting agent with Basal C increases its efficiency as a dormancy breaker.

Financial benefits

According to Defra Horticultural Statistics (Provisional Figures for 2020), a total of 16.4 thousand tonnes of blackcurrants were produced in the UK and this was worth a value of £28.1 million. A reduction in yield of as little as 10% due to incomplete bud break following a mild winter could therefore result in a reduced income of £2.8 million for the blackcurrant industry and in many wild winters, losses are likely to rather more than this.

The use of effective dormancy breaking products, applied to blackcurrant bushes during the late winter period, therefore have the potential to make savings of several million pounds for the UK blackcurrant industry each season.

Action points for growers

- Where insufficient winter chilling has occurred in blackcurrants, use an effective dormancy breaking product in the late winter period at 3% green tip stage.

Use either a commercially available product:

- Brecaut LG 440 + Brecaut LG 441
- Bluprins + Bluact
- Erger + Active Erger

Or via a fertilizer mix of readily available products:

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